Rethinking Posttraumatic Growth: Psychological Processes, Outcomes and Individual Differences Between Survivors of Multiple Types of Adverse Events

By

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Extended abstract

This thesis examines the claim that people can report positive changes following adverse experiences, in a phenomenon known as posttraumatic growth (PTG). Existing literature has advanced knowledge of factors related to PTG, although the applicability of existing theories to explain PTG in survivors of multiple adverse events is unclear. The extent to which PTG is related to event characteristics and posttraumatic stress is ambiguous. In addition, factors associated with long-term PTG change are poorly understood, and there are concerns that PTG may not always reflect positive improvements in well-being. Adopting a mixed-method approach across four studies, this thesis investigated the psychological processes implicated in PTG development, beginning with the characteristics of the adverse event, followed by attempts to understand the experience, and concluding with longer-term PTG outcomes. Study 1 addressed a gap in the literature by examining the extent to which the type, frequency and timing of adverse events were associated with PTG in 268 survivors of multiple and wide-ranging events. It was found that while the type, frequency and timing of adverse events were unrelated to growth, event characteristics shaped emotional responses to the event which were conducive of PTG. Study 2 explored these individual differences in PTG outcomes using semi-structured interviews with 26 people exposed to cumulative adversity from Study 1. Findings provided insight into the psychological factors that facilitate or inhibit PTG, drawing attention to the social context in which growth can occur and emphasising the key role of cognitive processes. Study 3 drew upon key cognitive themes from Study 2 to develop a model to explain relationships between cognitive processing variables not accounted for in existing PTG frameworks in 250 survivors of multiple types of adverse events to report growth and distress. Finally, Study 4 assessed the factors that influence PTG trajectories over an 18-month period using the 268 participants from studies 1 to 3. Intrusive thoughts were the strongest predictor of the average growth trajectory, regardless of the type, frequency, or experience of subsequent events. Four distinct PTG trajectories were revealed that were influenced by a range of psychosocial variables that promoted positive well-being. Growth reports also appeared to serve as a coping strategy. The unique contributions of this thesis have implications for understanding the nature and process of PTG. First, existing PTG models require further revision and expansion to accommodate individual differences. Second, event characteristics can indirectly influence growth through coping, cognitive and social factors that allow people to succumb or thrive after cumulative adverse events. Third, growth is accompanied by distress and vice-versa. Fourth, growth may reflect a coping strategy to minimise distress and thus not reflect actual change, yet also co-exist alongside enhanced psychological functioning in other cases. Finally, PTG is not always

consistent or stable over time as previously thought, and can serve different psychological functions. More mixed-method and longitudinal investigations are needed to advance the study of PTG so that firm recommendations can be made to inform clinical practice.

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Glossary of terms

-2LL	-2 log likelihood
2-Way SSS	Two-Way Social Support Scale
ACPM	Affective-cognitive processing model
AIC	Akaike Information Criterion
ANOVA	Analysis of variance
APA	American Psychological Association
AVE	Average variance extracted
BCa CI	(Bias-corrected) confidence interval
BIC	Bayesian Information Criterion
BPS	British Psychological Society
BVS	Beliefs and Values Scale
CES	Centrality of Events Scale
CGAS	Cognitive growth and stress (model)
CFA	Confirmatory factor analysis
CFI	Comparative Fit Index
CR	Composite Reliability
CSA	Child sexual abuse
DSM-V	Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition
ERRI	Event-Related Rumination Inventory
FDM	Functional-descriptive model
GCM	Growth curve modelling
JFM	Janus-face model
ICC	Intraclass correlation coefficient
ICD-10	International Classification of Diseases – version 10
IPV	Intimate partner violence
MSV	Maximum Shared Variance
OR	Odds ratio

OVT	Organismic valuing theory
PCA	Principal components analysis
PCOSES	Perceived Control Over Events Scale
PDS	Posttraumatic Diagnostic Scale
PRV	Proportion reduction in variance
PTG	Posttraumatic growth
PTGI	Posttraumatic Growth Inventory
PTGI-SF	Posttraumatic Growth Inventory – Short Form
PTS	Posttraumatic stress
PTSD	Posttraumatic stress disorder
RMSEA	Root mean square error of approximation
SEM	Structural equation modelling
SD	Standard deviation
SE	Standard error
SRMR	Standardised root mean square residual
TLI	Tucker-Lewis index
VIF	Variance inflation factor

Publications and presentations arising from thesis

Publications

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CHAPTER ONE: Introduction

"When faced with ugliness and darkness, I wanted to replace that what had been taken from me, and turn it into something a hundred times more wonderful."

– Anonymous participant (2014), Study 2

The above quote are the words of one man who experienced prolific sexual abuse as a child, subsequently went on to travel the world and embark on a career helping others facing similar challenges. Despite the long-term negative effects of his adversity, he felt able to use his experiences and turn them into something positive. This remarkable story is not unique. While negative reactions are a significant aspect of many people's experiences of adversity, some people can report positive changes as well. These positive changes are collectively known as *posttraumatic growth* (PTG; Calhoun & Tedeschi, 2014; Linley & Joseph, 2004; Tedeschi & Calhoun, 1995), which are experienced as a result of the emotional struggle with highly challenging life events. PTG can encompass changes in various life domains, including an increased perception of personal strength, the opening up of new possibilities, closer interpersonal relationships, enhanced religious or spiritual beliefs, and a greater appreciation for life (Tedeschi & Calhoun, 1996). At an individual level, people may report a greater sense of confidence, maturity, altruism and control over their lives (Shakespeare-Finch, Martinek, Tedeschi, & Calhoun, 2013; Tedeschi & Calhoun, 1995), while others may be grateful at being given a "second chance" and subsequently view extrinsic goals (such as making money) as less important compared to relationships with family and friends (Joseph, Williams, & Yule, 1993; Mapplebeck, Joseph, & Sabin-Farrell, 2015). The experience of growth is therefore multidimensional and can encompass a range of positive changes.

This introductory chapter thus sets the focus of the thesis. It begins by providing a brief overview of the research context, before highlighting gaps in the existing literature in which the research problem is framed. The chapter concludes by providing an outline

of the structure of the thesis. The following sections intend to provide a *brief* overview of the key issues in PTG research, which are discussed in more detail within the literature review in Chapter 2.

1.1. Research context

The idea that people can seemingly become stronger after significant life events is not new. Throughout human history, literature, philosophy and religion have recognised the potential for people to report positive gains from adversity. Radical changes that can occur following life struggles were surmised in the famous proclamation, “That which does not kill us, makes us stronger” (Nietzsche, 1889). Early Greek and Hebrew writings speak of good arising from adversity, whilst Buddhist, Christian, Hindu and Islamic scriptures emphasise the transformative power of overcoming hardship (Tedeschi & Calhoun, 2004). During the late 1980s and 1990s Stephen Joseph, William Yule and colleagues – researchers at the Institute of Psychiatry in London – were some of the first to identify the potential for individuals to experience positive changes following an adverse event. Their studies (Dalgleish, Joseph, & Yule, 2000; Joseph, Brewin, Yule, & Williams, 1991; Joseph et al., 1993) following the *Herald Free Enterprise* shipping disaster in 1987 were initially focused on documenting the negative psychological aftereffects of the disaster, yet their research found that 43% of sampled survivors believed their life had changed for the better. This suggested that, while adverse events were often distressing, the psychological aftermath was not a solely negative experience for some people.

Despite widespread and ancient roots, it was not until the mid-1990s when the term *posttraumatic growth* was explicitly coined by Tedeschi and Calhoun (1995) in their now seminal book, *Trauma & transformation: Growing in the aftermath of suffering*. They conceptualised PTG as a means to explain why some people can go above and beyond a state of recovery to thrive in the face of adversity. The authors argued that ‘seismic’ life events can lead to an emotional struggle which causes individuals to re-examine their

world beliefs. Since then, more systematic empirical investigations have started to emerge which have provided researchers with an exciting new perspective to investigate psychological adjustment after adverse events.

The prevalence of exposure to adverse events among the general population is thought to be high at around 89.7%, yet only approximately 8.3% of people struggle to recover naturally in their lifetime (Kilpatrick et al., 2013). Early theories of recovery after adversity (e.g. Janoff-Bulman, 1992), assert how adverse life events can significantly challenge a person's views about themselves and the world. It is claimed that in the aftermath of an adverse event, people must rebuild their assumptions to fully process the emotional distress and maintain an organised way of viewing the self and world. Individuals who have experienced adverse events are at risk of experiencing a range of negative symptoms, which have already been widely documented to include posttraumatic stress disorder (PTSD; American Psychiatric Association, 2013), depression (Nolen-Hoeksema & Morrow, 1991), anxiety (de Jongh et al., 2008), low self-esteem (Clements, Sabourin, & Spiby, 2004), and difficulties with emotional regulation (Ehring & Quack, 2010), occupational (Armstrong, Shakespeare-Finch, & Shochet, 2014) and social functioning (Ogle, Rubin, & Siegler, 2013) that go beyond normative distress. Efforts to identify negative changes have been hugely beneficial in terms of developing interventions and supporting those with the significant life challenges as a result of exposure to adverse events. However, research can provide a biased interpretation of people's responses to adverse events by only looking for negative changes, without measuring the positive gains from their experiences. There is a need to explore reports of positive changes in response to adverse events to obtain a more balanced understanding of post-event adaptation.

The study of PTG gained momentum in the late 1990s and 2000s with the growth of positive psychology (see Chapter 2, section 2.2.). Positive psychology was developed to counter the traditional emphasis on human deficiency and weakness, and instead encouraged researchers to focus on an individual's strengths (Maddux, 2008; Seligman

& Csikszentmihalyi, 2000). In the initial stages of PTG research, studies documented growth in response to a range of adverse events, including significant life-changing encounters with natural disasters or sexual assault (Cieslak et al., 2009; Frazier, Conlon, & Glaser, 2001), and more recently, normative life stressors such as relationship breakdown (del Palacio-González, Clark, & O'Sullivan, 2017). Research has since moved beyond merely identifying the presence or absence of PTG to explore cognitive, psychological and social factors that make growth more (or less) likely to occur (Elderton, Berry, & Chan, 2017; Hefferon, Grealy, & Mutrie, 2009; Linley & Joseph, 2004; Prati & Pietrantoni, 2009; Ulloa, Guzman, Salazar, & Cala, 2016). These investigations have provided a greater insight into the PTG phenomenon, although the psychological processes which can induce growth, and the circumstances under which it occurs, still remain unclear.

1.2. The research problem and contribution to knowledge

Over the past two decades, there have been considerable advances in our understanding of positive changes following adversity, but much remains unknown. In fact, research still cannot agree as to what the concept of PTG is, or what it represents (Jayawickreme & Blackie, 2014; Tedeschi & Calhoun, 2004; Tennen & Affleck, 2002). Recent years have seen several topical debates and gaps emerge in the literature, which this thesis will seek to address. If PTG research is to progress and develop, there is a need to examine areas where empirical evidence is scant, or where there is a lack of agreement. The central concern of this thesis is to examine and explore the psychological processes whereby PTG is experienced, beginning from the characteristics of the initial event that provides the context for the emotional struggle, through to attempts to find meaning, and finally, any longer-term changes that may occur. The current debates and gaps in the literature are briefly outlined below and discussed in more detail within the Chapter 2 literature review. Addressing these debates will provide greater clarity as to the underlying psychological mechanisms and social-environmental conditions that explain why some people report more (or less) PTG

following encounters with adverse events. It will also allow practitioners to gain an awareness of positive changes in their clinical practice, which could help some survivors in their recovery.

Several models have been proposed that illustrate the PTG process (Joseph, Murphy, & Regel, 2012; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006), but these have not received widespread empirical validation, nor have they been revised to reflect current knowledge. Thus, it is unclear how these frameworks adequately account for people's individual experiences of growth. Furthermore such models assume that subjective impact of the event is more salient compared to the characteristics of the event itself (Linley & Joseph, 2004; Tedeschi & Calhoun, 2004), although some literature suggests that this may not always be the case (Kira et al., 2013; Kılıç, Magruder, & Koryürek, 2016; Tedeschi & Calhoun, 1995). Therefore, a gap in our understanding of how the type, frequency or developmental timing of adverse events influence PTG could inform the way in which practitioners respond to survivors.

Research has also discussed the extent to which PTG is related to other psychological consequences associated with adverse events, namely posttraumatic stress (PTS; Shakespeare-Finch & Lurie-Beck, 2014). It still remains unclear how growth and distress are related to one another, if at all, as studies have reported mixed findings (Frazier et al., 2001; Kashdan & Kane, 2011; Shakespeare-Finch & Lurie-Beck, 2014). This lack of clarity can hinder efforts by practitioners to support those affected by adverse events, as distress has traditionally been viewed as a failure to process the adverse experience (Ehlers & Clark, 2000), contrary to recent views that distress is actually an engine of subsequent growth (Tedeschi & Calhoun, 2004).

What is more, the idea that growth as perceived by individuals is accurate has been challenged recently (Blackie et al., 2017; Frazier et al., 2009; Jayawickreme & Blackie, 2014). Data suggests that beliefs about growth may not always be related to meaningful cognitive or behavioural changes. Instead, PTG may be associated with

negative psychological outcomes (Hobfoll et al., 2007), sustained by *illusory* coping strategies employed to minimise the distress following adverse events (Zoellner & Maercker, 2006). Growth may thus not reflect *actual* or *constructive* changes that have a basis in reality, as widely purported by PTG theorists who argue that growth is linked with increased psychological well-being (Tedeschi & Calhoun, 2004). It may be that growth serves as a coping strategy for some survivors, is associated with *actual* psychological change in others, or has both *illusory* and *constructive* elements; however, at present, this idea lacks empirical validation.

In addition, PTG is argued to be a temporal construct (Blix, Birkeland, Hansen, & Heir, 2016; Tedeschi & Calhoun, 2004), yet longitudinal studies of PTG are limited. This means it is not fully possible to understand how PTG, and the nature of growth, changes over time as a function of wider cognitive, emotional, psychological and social factors. The central aim of this thesis is to address these issues in order to provide greater clarity as to the processes and outcomes associated with PTG.

1.3. Chapter outlines

To address the aims and objectives of the thesis briefly outlined in the present chapter, the following structure was adopted.

Chapter 2: Literature review

To introduce the reader to the topic, the literature review begins by outlining the background to positive psychology and the emergence of PTG from the wider literature on adverse events. It will move on to discuss characteristics of PTG, alongside an outline of the three guiding theoretical perspectives used throughout the thesis. Finally, the chapter concludes with a discussion of factors associated with reports of positive change, noting areas where there is limited empirical research.

Chapter 3: Thesis aims and research questions

In Chapter 3, the overall aim and five research questions to be addressed in the thesis are presented. The aim and questions are informed by the literature review in Chapter 2 (although the longitudinal element is further described in Study 4).

Chapter 4: Methodological approach for the thesis

This chapter outlines the epistemological approach and methodology employed to address the research aims and objectives outlined in Chapter 3. Specifically, a mixed-method approach is outlined, which incorporates elements of quantitative and qualitative methodology, cross-sectional and longitudinal design, and online and paper-based methods for data collection. The sampling strategy and ethical issues are also discussed.

Chapter 5: Adverse event characteristics and posttraumatic growth (Study 1a & 1b)

Chapter 5 (hereafter referred to as Study 1)[1] is comprised of two studies that examine the extent to which the objective characteristics of the event relate to PTG alongside more established psychosocial predictors of growth. Study 1a assesses whether event-related and psychosocial factors differently relate to PTG in three samples of students (*N* = 101), violent crime survivors (*N* = 71) and those working with distressed populations (*N* = 96), each of whom, it is argued, experience adversity of varying frequency and type. By combining the three samples from Study 1a, Study 1b extends the findings to examine whether psychosocial factors can mediate the relationship between event characteristics and PTG. Both studies address a gap in the literature by shedding further light on the way in which event characteristics could indirectly relate to growth through coping responses.

[1] The empirical chapters are identified by their study numbers to clearly differentiate them from the remaining chapters.

Chapter 6: The experience of posttraumatic growth – A qualitative investigation (Study 2)

Chapter 6 (hereafter referred to as Study 2) adopts a qualitative approach to understanding the psychological processes and outcomes associated with PTG in much more depth than what is afforded by quantitative methods alone. Experiences of positive change were explored through semi-structured interviews with 26 individuals from Study 1 who were exposed to multiple types of adverse events. In addition, factors that can inhibit or facilitate the PTG process are identified, thereby revealing the complexity of growth experiences in those with cumulative adversity.

Chapter 7: Cognitive processing and posttraumatic growth – A literature review

As cognitive processing themes strongly emerged within Study 2, a brief review of key cognitive factors is presented. The chapter discusses the role of different types of rumination, event centrality and perceived control on psychological adjustment, noting the lack of attention given to these factors within the PTG literature.

Chapter 8: Rumination, event centrality and perceived control as predictors of posttraumatic growth and distress – The Cognitive Growth and Stress model (Study 3)

Informed by the findings of Study 2 and literature review in Chapter 7, Chapter 8 (hereafter referred to as Study 3) adopted structural equation modelling techniques to simplify the mechanisms that lead to PTG or PTS. The Cognitive Growth and Stress model is proposed and tested in a sample (N = 250) of people exposed to a diverse range of events. The model identifies relationships between cognitive variables responsible for both growth and distress, thus providing a useful clinical tool for practitioners.

Chapter 9: Trajectories of posttraumatic growth – A longitudinal investigation (Study 4a & Study 4b)

The final empirical chapter (hereafter referred to as Study 4) examines and explores how PTG changes over time. It is comprised of two studies. Study 4a extended the cross-sectional findings from Study 1 to examine the extent to which event characteristics and intrusive thoughts influenced changes in PTG over an 18-month period using the 268 participants from studies 1 to 3. Using a mixed-method analysis that draws upon the findings from all empirical chapters in this thesis, Study 4b explores whether there are distinct long-term trajectories of growth that appear to serve different psychological functions for people (N = 42) recovering from multiple types of adverse events.

Chapter 10: General discussion

Concluding the thesis, Chapter 10 draws together the key theoretical and practical implications arising from the work. The chapter summarises the five unique contributions of this thesis in respect of the research questions identified in Chapter 3. First, it is argued that existing PTG theories require modification to accommodate individual differences in experiences of growth. Second, event characteristics are indirectly related to PTG, thus linking objective and subjective elements of the adverse event and its responses for the first time. Third, PTG and PTS are closely intertwined and may be better explained through a curvilinear relationship. Fourth, PTG is argued to serve other functions in addition to tangible behavioural and cognitive improvements in well-being, such that it may equally serve as a coping strategy to mitigate distress from adverse events. Finally, the long-term course of PTG is not stable as previously thought, and appears to be determined by a range of cognitive and psychological variables. The overall strengths and limitations of the thesis are then presented, along with recommendations for future empirical investigations on PTG. It is argued that while

significant advances have been made in our understanding of positive changes, more methodological rigor is needed to determine the true nature of growth after adversity.

CHAPTER TWO: Positive changes after adversity – A literature review

2.1. Chapter introduction

This chapter reviews the literature on PTG, beginning with the emergence of positive psychology and its relevance to the thesis. Next, conceptual issues relating to positive changes after adversity will be discussed. Following a description of the theoretical approach of the thesis, the chapter will conclude with a discussion of factors associated with the development of PTG identified from the empirical literature.

2.2. Emergence of positive psychology

Positive psychology has been defined as the "scientific study of human strengths and values" (Sheldon & King, 2001, p. 216). It is concerned with developing knowledge of the processes and factors that allow individuals to flourish. In their seminal article, Seligman and Csikszentmihalyi (2000) argue that psychology's traditional focus on fragility has excluded the investigation of positive qualities and values which also form a part of human experience, such as love, wisdom and kindness. The movement has since become very influential with empirical investigations adopting a more holistic view of human experiences, rather than being solely framed by deficiency and weakness.

Although positive psychology is often attributed to the address of Martin Seligman at the American Psychological Association (APA) conference in 1999, it has roots extending back to the early 20th century. The works of Jung (1933), Maslow (1954) and Rogers (1957), among others, emphasised non-pathological interpretations of the person, and rejected the application of the medical model to psychology. Poignantly, it was remarked that through the dominance of the pathological model:

> *"psychology had learned much about depression, racism, violence, self-esteem management, irrationality, and growing up under adversity, but had much less to say about character strengths, virtues, and the conditions that lead to high levels of happiness or civic engagement" (Gable & Haidt, 2005, p. 103).*

Following the address of Seligman at the APA (1999) conference, positive psychological research was energised, with two important implications. First, a new conceptual 'home' and shared language was created that brings together related studies of positive human experiences (Linley, Joseph, Harrington, & Wood, 2006). Second, positive psychology permitted the integration of knowledge of previously unexplored positive character traits, virtues and conditions, with existing literature on negative changes. In doing so, the addition of positive psychology offers a more balanced perspective to understand human behaviour and the fundamental factors that make life worth living (Seligman & Csikszentmihalyi, 2000).

The philosophical approach of positive psychology underpins this thesis as it makes important contributions to understanding responses following adverse events. Traditionally, clinical psychology was dominated by a rigid 'illness ideology' that was concerned with promoting dichotomies between what it viewed as 'normal' everyday problems and 'abnormal' behaviour in the form of psychopathology (Maddux, 2008). As such, it tended to view mental conditions like depression as distinct from everyday difficulties that people experience in their lifetime. The ideology therefore placed the onus of psychological disorders on the individual, rather than their interactions within the social environment (Maddux & Lopez, 2015). A further consequence of this view was that the approach focused on alleviating distress, at the expense of promoting positive wellbeing (Maddux, 2008).

In contrast to the illness ideology, the positive psychological perspective is more flexible and inclusive. It is concerned with everyday problems that affect many people, as well as more 'extreme' psychopathology which affects a smaller proportion of the population. Unlike the illness ideology, positive psychology recognises the role of the social, cultural and environmental factors in the aetiology of difficulties in everyday

functioning for some people (Maddux & Lopez, 2015). Therefore, this thesis embraces the positive psychological approach, rather than relying on a restrictive medicalised framework which would impede understanding of human responses to adversity.

Positive psychology has been observed as an overly simplistic view to the study of human wellbeing. Critics equate positive psychology to a "Pollyanna" approach that encourages people to disregard negative wellbeing and instead focus on the positives (Lazarus, 2003). However, such statements represent a misunderstanding of the positive psychology movement, which does not deny distressing aspects of life nor believes that positive thinking alone will resolve negative experiences (Gable & Haidt, 2005). This thesis, and positive psychology approaches more generally, are concerned with the *whole* spectrum of human experiences. For example, the thesis considers theories that question the validity of some perceived positive changes (see section 2.6.2.1.). Adopting this more flexible interpretation of PTG is in-keeping with a more nuanced understanding of the multifaceted function that positive changes can serve (Lazarus, 2003). Such an approach should only have constructive implications for improving the wellbeing and quality of life for those exposed to adverse events.

2.3. Definitions and conceptual issues

2.3.1. Adverse events

Definitions of what constitutes an 'adverse event' vary considerably within the literature. The fifth update to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) considers an adverse event[2] as "exposure to actual or threatened death, serious injury or sexual violence" (American Psychiatric Association, 2013, p. 271). This definition can refer to a single event, or a prolonged or repeated experience(s) that can overwhelm the person and thus result in great emotional distress. Adverse events are

[2] While the thesis acknowledges that 'trauma' is a popular term for adverse events within the literature, it recognises that not all negative events are perceived to be 'traumatic' (Saywitz, Mannarino, Berliner, & Cohen, 2000). As PTG shares the common idea of struggling with adversity (Linley & Joseph, 2004), this more objective term is subsequently used throughout this thesis to refer to any life experience that is viewed negatively.

those which are sudden and often unexpected, exceeding the individual's capacity to meet the demands of the situation, and disrupting the person's frame of reference or other psychological needs (McCann & Pearlman, 1990). Using the DSM-V criteria, adversarial events can include direct exposure or being witness to accidents, natural disasters, physical or sexual assault, warzone and conflict, or violence and/or threats that have resulted in death or severe injury to family or close friends (Kilpatrick et al., 2013). In contrast, the tenth edition of the International Classification of Diseases (ICD-10) adopts a somewhat more liberal definition of adverse events, which can "result in pervasive distress to almost anyone" (World Health Organisation, 2010, F43.1).

The aforementioned definitions reflect a wider disagreement within the literature on adverse events. The central concern finds that too inclusive a definition would lead to a "conceptual bracket creep" (McNally, 2009, p. 3) in which the distinction between life-changing events and daily life stressors becomes less clear (Weathers & Keane, 2007). This may lead to interventions specifically designed to treat posttraumatic stress disorder[3] (PTSD; see section 2.7.2. for discussion) being inappropriately applied or misdirected. However, a more restrictive approach could invalidate the subjective experiences of individuals and inadvertently minimise their distress. It has been suggested that research should focus on the meaning of the event to the individual, rather than attempting to provide an objective definition of an adverse event (Milchman, 2016). Therefore, any adverse event could be construed as 'traumatic' if it is perceived to be the case by the individual; rather, it is the underlying factors and conditions that lead people to view events as 'traumatic' that are of primary interest to researchers. Adverse reactions from non-life-threatening events would indicate the subjective nature of adverse events. Negative reactions have been observed in relation to divorce and unemployment (Mol et al., 2005), wisdom tooth removal (de Jongh et al., 2008), offensive remarks (Avina & O'Donohue, 2002), and in farmers who lost cattle to foot-and-mouth

[3] This thesis uses the term 'PTSD' when referencing the DSM-V criteria and studies that have used this term. However, the thesis also uses the term 'posttraumatic stress' (PTS) to describe similar symptoms that do not necessarily meet the strict diagnostic criteria.

disease (Olff, Koeter, Van Haaften, Kersten, & Gersons, 2005). Adverse reactions are also found within the PTG literature in response to a wide range of events (see section 2.3.4.), which would suggest that the primary interest concerns the reaction to the adverse event, rather than the event itself.

In line with the above, this thesis adopts a flexible definition of an 'adverse event' that not only includes significantly life-changing events identified in the DSM-V, but also any event that participants report as severe or distressing. This is in response to the lack of clarity with regard to the distinction between everyday life events and those considered 'traumatic'. Furthermore, including events solely on the basis of objective criterion would inhibit the very investigations that could identify why some people find everyday life stressors to be particularly distressing, as well as those who remain seemingly unaffected in the face of significant adversity. Thus, participants in this thesis were those who experienced a diverse range of adverse experiences (see Chapter 4, section 4.7. for sampling strategy) in order to advance knowledge of individual differences and the circumstances that facilitate or inhibit positive and negative change.

2.3.2. Positive psychology and the study of adverse events

As previously noted (section 2.2.), the narrow lens of the medical model in the study of human experiences, including responses to adverse events, may lead one to perceive negative changes as indicative of 'disorder'. Despite the valuable contributions that research on PTS has provided, it could be argued that it has created an incomplete and unbalanced view of human recovery following adverse events. In fact, negative reactions to adverse events are a natural element of human experience, which the PTG literature does not seek to deny (Tedeschi & Calhoun, 1995). Equally, only a small proportion of the population (around 8.3%) develop symptoms of PTSD following adverse events in the lifetime (Kilpatrick et al., 2013), thus implying that most people are seemingly resilient in the face of significant life challenges.

In a wider positive psychological context, the goal of PTG researchers is to emphasise the potential for positive as well as negative change, and challenge assumptions that any distress is somehow reflective of pathology. PTG may therefore be referred to as a *salutogenic* concept, which places an emphasis on factors that promote well-being, rather than a sole focus on pathological outcomes (Antonovsky, 1987). At the same time, PTG researchers point out that positive improvements in well-being are not dependent on an absence of negative outcomes or distress (Calhoun & Tedeschi, 2014). Therefore, the emergence of positive psychology provides an exciting new opportunity to widen the focus on human responses to adverse events.

2.3.3. Posttraumatic growth

PTG refers to "positive psychological change that occurs as a result of the struggle with highly challenging life events" (Tedeschi & Calhoun, 2004, p. 1). These positive changes drive individuals to a higher state of psychological functioning than that which existed prior to the adverse event (Linley & Joseph, 2004). Growth is therefore distinguished from other responses to adverse events that involve resilience or a return to a baseline level of functioning (see section 2.5. for discussion). People who experience PTG may therefore develop new perspectives about themselves and the world around them that give their lives new meaning and purpose.

The concept of PTG has been variously defined as *adversarial growth* (Linley & Joseph, 2004), *benefit finding* (Helgeson, Reynolds, & Tomich, 2006), *positive adaptation* (Hoffman, 2013), *stress-related growth* (Park, Cohen, & Murch, 1996), *thriving* (O'Leary & Ickovics, 1995) and *transformational coping* (Aldwin, 1994) in the literature. Although the numerous terms reflect some conceptual differences, they all share the view that positive changes can be attained following some encounter with adversity.[4] This is *not* to say that experiencing adversity is positive, nor is a conscious

[4] In this thesis, 'PTG' is used to describe the transformation, as terms such as *flourishing* and *thriving* do not accurately capture the emotional struggle that precedes the experience of positive changes. PTG is also the most widely used and recognisable term in the literature among researchers.

goal for survivors, rather, PTG is a possible product of the struggle with highly stressful events.

PTG has been observed across a diverse range of adverse events, including transport accidents (Joseph, Williams, & Yule, 1993), natural disasters (Lowe, Manove, & Rhodes, 2013), childhood abuse (Woodward & Joseph, 2003), sexual violence (Ulloa et al., 2016), intimate partner violence (Elderton et al., 2017), war zones (Kılıç et al., 2016), terrorism (Butler et al., 2005), and serious physical and mental illnesses (Hefferon et al., 2009; Mapplebeck et al., 2015). Positive changes have also been reported with events that would not traditionally fit DSM-V criteria, such as infidelity (Heintzelman, Murdock, Krycak, & Seay, 2014), immigrants adjusting to life in a new culture (Kim, Suh, & Heo, 2014), 'coming out' as a sexual minority (Vaughan & Waehler, 2010) and among therapists with secondary exposure to adversity through contact with their clients (Brockhouse, Msetfi, Cohen, & Joseph, 2011; Cohen & Collens, 2013). For that reason, the PTG literature is also flexible in what it considers adverse events, emphasising individual meanings attached to experiences rather than adhering to restrictive DSM-V criteria.

2.3.4. Prevalence of posttraumatic growth

It is hard to quantify the prevalence of PTG in those who experience adversity. A review of 39 empirical studies found the overall prevalence of PTG to vary greatly, ranging from 3% and 98% across events (Linley & Joseph, 2004). The lowest reported prevalence of PTG (3%) was found among a sample of bereaved individuals (Davis, Nolen-Hoeksema, & Larson, 1998) and the highest (98%) among women with breast cancer (Weiss, 2002). Most research finds PTG to be a relatively common outcome; a study of breast cancer survivors five to 15 years after diagnosis found high rates of PTG in respect of appreciation for life and personal strength (prevalence ≥ 86.3%), with the lowest rates (≤ 39.7%) for spiritual change, measured using the Posttraumatic Growth Inventory (PTGI; described in Study 1, section 5.5.2.; Lelorain, Bonnaud-Antignac, &

Florin, 2010). In other studies, nearly 75% of sampled Israel youth reported PTG following a terrorist attack (Laufer & Solomon, 2006), and 98.6% of participants in a sample of emergency ambulance personnel endorsed at least a small degree of growth (Shakespeare-Finch, Smith, Gow, Embleton, & Baird, 2003). However, one longitudinal study of earthquake survivors found the prevalence of PTG to lie at 51.1% a year after the event (Jin, Xu, & Liu, 2014). It is therefore difficult to establish the rate of PTG in the literature, as any differences are likely due to the types of methodologies adopted and nuances within the samples tested. For example, some studies adopt a biased sampling technique (Poorman, 2002) by identifying participants on the basis that they have reported growth, which limit conclusions about PTG from prevalence figures alone.

While attempts to establish specific prevalence rates of growth can be misleading, the available evidence does suggest that PTG is not a universal or guaranteed outcome following adversity. Implying growth is an inevitable response to adverse events would place an unnecessary expectation on people to report positive changes (Wortman, 2004). Rather, growth should be viewed as part of the wider process of psychological adjustment in some people, which does not necessarily equate to an absence of distress (Tedeschi & Calhoun, 2004; see section 2.7.2. for discussion of the relationship between distress and growth).

2.4. Characteristics of posttraumatic growth

Proponents of PTG assert that positive changes can fall under five broad domains: appreciation for life, new possibilities, personal strength, relating to others and spiritual change (Linley, Andrews, & Joseph, 2007; Morris, Shakespeare-Finch, Rieck, & Newbery, 2005; Taku, Cann, Calhoun, & Tedeschi, 2008; Tedeschi & Calhoun, 1996). It is necessary to stress that as PTG is multidimensional, positive changes do not need to reported in all five domains for growth to occur (Tedeschi & Calhoun, 2004).

2.4.1. Appreciation for life

Adverse events can lead individuals to recognise their own mortality and the shortness of time. People may report that they now try to enjoy and appreciate each day more, and find meaning in new experiences (Kuenemund, Zwick, Rief, & Exner, 2016). Events that previously seemed significant may now be viewed as trivial, with greater meaning attached to intrinsic priorities (such as spending time with family) rather than extrinsic goals (e.g. making money; Calhoun & Tedeschi, 2014). Exposure to the negative aspects of human experience may also allow people to celebrate the positive aspects of their lives to a greater degree (Mapplebeck et al., 2015) and value the 'second chance' that they have been given (Joseph et al., 1993).

2.4.2. New possibilities

Paradoxically, the confrontation with adversity may present new life opportunities. Individuals may wish to learn new skills, change or take up new careers, or advance a new cause (Shakespeare-Finch et al., 2013; Staub & Vollhardt, 2008). This could involve a return to education, adopting altruistic careers, or a focus on one's health. People may therefore change their priorities about what is important and follow different life paths to those identified before the adverse event (Tedeschi & Calhoun, 1996).

2.4.3. Personal strength

In the aftermath of adversity, the recognition of personal strength, or an increased sense of strength, is another key characteristic of PTG. Other perceived changes include more openness, confidence, creativity, maturity, humility, empathy and an "improved self" (Tedeschi & Calhoun, 1995, p. 456). These characteristics may have already been present but individuals were unaware of them. After overcoming previous adversity, people may also report an increased capacity to manage future stressors (Shakespeare-Finch et al., 2013). Individuals speak of regaining control over their lives and an inner drive to "keep going", perhaps to attain something better following the emotional struggle with their experiences (Mapplebeck et al., 2015).

2.4.4. Relating to others

People generally report enhanced relationships with other people following adversity. This can include closer relationships with family, friends, neighbours and other people who may have experienced similar events to the individual. People may describe increased expressiveness of emotion, a sense of belonging, feeling understood and recognising the importance of role models to help in their own recovery (Mapplebeck et al., 2015). Improved relationships may extend to an altruistic desire to help others in similar situations (Vanhooren, Leijssen, & Dezutter, 2017). At the same time, individuals may have a greater awareness of who they can depend on, and have a desire to maintain close or intimate relationships with friends, family members and partners (Shakespeare-Finch et al., 2013).

2.4.5. Spiritual change

Encounters with adversarial events can prompt engagement with fundamental existential questions. Individuals need not be actively religious to experience growth in this domain (Tedeschi & Calhoun, 2004). Religious experiences can bring about a sense of connectedness with others (Woodward & Joseph, 2003), with some people becoming members of religious communities (Mapham & Hefferon, 2012). Placing one's faith in a higher entity can provide some meaning and purpose to life (Shaw, Joseph, Linley, & Linley, 2005). PTG is also endorsed in those with non-theistic beliefs, with people reporting a greater spiritual connection to the world and nature (Shakespeare-Finch et al., 2013). This is not to say that all individuals report spiritual or religious growth, as some people can experience spiritual or religious decline following adverse events (Walker, Reid, O'Neill, & Brown, 2009). Furthermore, these changes are dependent on the wider sociocultural context. The vast majority of studies have taken place in the 'Western' world or interpreted within individualistic norms characteristic of Western society (Splevins, Cohen, Bowley, & Joseph, 2010). However, there is variation within Western societies; American samples typically report more religiosity than counterparts

in more secular European countries (Calhoun, Cann, & Tedeschi, 2010), and Australia (Shakespeare-Finch & Copping, 2006).

2.5. Distinguishing posttraumatic growth from related concepts

PTG can be distinguished from other concepts that also describe the ability to handle adversity well. *Resilience*, *hardiness*, *optimism* and a *sense of coherence* all feature as interrelated constructs in the literature, and all collectively relate to positive adjustment following adverse events. Resilience is generally viewed as an ability to withstand challenging life circumstances and continue to lead a purposeful life (Connor & Davidson, 2003; Rutter, 1985). Hardiness refers to a triage of attributes, specifically, commitment towards other people, control over one's actions and being able to see challenges as opportunities rather than threats (Kobasa, 1979). Optimism is the expectation that more good things will happen than bad (Scheier & Carver, 1985). A sense of coherence relates to a person's ability to perceive that there are resources available to help them confront and find meaning in adverse situations (Antonovsky, 1987).

Unlike the aforementioned concepts, PTG refers to an ability to go beyond previous levels of functioning. It is the capacity to not only resist the negative psychological effects associated with adverse events, but to experience a higher level of positive adaptation and transformation (Tedeschi & Calhoun, 2004). While the concepts of resilience, hardiness, optimism and a sense of coherence are distinguished from PTG, they can still feature in reports of growth from people exposed to adverse events. For example, research suggests PTG can be associated with an increased tolerance to manage further adversity (Seery, Holman, & Silver, 2010), whereas resilient individuals may be less inclined to experience growth because they already have the necessary skills to deal with adverse events (Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009). Furthermore, those with an optimistic outlook may also be likely to experience PTG (Prati & Pietrantoni, 2009). While further work is needed to examine how growth

relates to other related factors, available evidence would suggest that PTG is a concept worthy of study in its own right.

2.6. Theoretical models of posttraumatic growth

Before the theoretical perspectives adopted in this thesis are discussed in detail, it is important to note that psychological theories pre-dating the emergence of positive psychology and PTG have also acknowledged the potential for growth. Crisis theory (Caplan, 1964) argues that confrontations with adversity can help people find new ways of dealing with life events, although it does not explicitly identify PTG. Similarly, transition theories are concerned with adjustment from adversity across the lifespan (e.g. Hopson, 1982) and recognise opportunities for growth, as does humanistic psychology (Jaffe, 1985). In the 1990s, researchers (Aldwin, 1994; O'Leary & Ickovics, 1995; Schaefer & Moos, 1992, 1998) separately suggested that growth is a possible outcome arising from adversity, and can be influenced by personal and environmental characteristics (see section 2.7. for discussion). Thus, while these theories acknowledged the potential for positive adaptation, they did not explicitly reference what has since become known as PTG nor attempt to systematically explain the phenomenon.

Drawing upon one interpretation of growth can shed further light on the concept of growth, although this unnecessarily restricts the contributions of other theories. Instead, this thesis proposes that no single theory can fully explain the nature, processes and outcomes associated with PTG in its entirety. Rather, the thesis argues that a combination of theories can explain this phenomenon in greater depth. Specifically, three theories will be used to orient the empirical studies in this thesis (see Table 1).

Table 1. *Summary of theoretical approaches adopted in this thesis*.

Theory	Reason for inclusion
Functional-descriptive model (FDM; Tedeschi & Calhoun, 1995, 2004)	Most comprehensive theory to date that explains the psychological processes involved in PTG development
Affective-cognitive processing model (ACPM; Joseph et al., 2012)	Explains relationships between growth and distress; acknowledges social-environmental context in which PTG occurs
Janus-face model (JFM; Maercker & Zoellner, 2004; Zoellner & Maercker, 2006)	Questions the validity of PTG by proposing a constructive and illusory aspect

First, the *Functional-descriptive model* (FDM; Tedeschi & Calhoun, 1995, 2004) was selected as it is the most detailed account of the processes associated with PTG to date. Second, the *Affective-cognitive processing model* (ACPM; Joseph et al., 2012) integrates emerging knowledge on PTG with existing knowledge on PTS, thus explaining how these two possible outcomes are related. Both of these theories consider growth as an *outcome* that is reached following the emotional struggle with adverse events. Finally, the *Janus-face model* (JFM; Maercker & Zoellner, 2004; Zoellner & Maercker, 2006) places PTG in the context of the wider coping literature and provides a framework with which to question the adaptive significance of growth. As such, the JFM views PTG primarily as a *process* that is triggered by a seismic life event. Together, these three theories are not only reflective of current debates in the literature, but provide a more comprehensive understanding of positive changes following adversity. The following sections (2.6.1. and 2.6.2.) therefore describe the key features of the respective models, while supporting evidence is discussed in section 2.7. in greater detail.

2.6.1. Posttraumatic growth as an outcome

Theories specifically concerned with the development and nature of PTG have only existed for the past two decades. These have broadly fallen into two perspectives, the first of which construes PTG as an outcome of the struggle with adversity. This approach stems from earlier work (Aldwin, 1994; Janoff-Bulman, 1992; O'Leary &

Ickovics, 1995; Schaefer & Moos, 1992, 1998) that finds growth as one of four possible outcomes after a stressful life event, represented in Figure 1. Two outcomes refer to a deteriorated level of functioning in which the person can either perceive irreparable psychological damage (*succumbing*), or never fully recover to their pre-event state (*survival with impairment*). There may be a return to a baseline level of functioning (*resilience*, see section 2.5.), or an improved level of functioning (*PTG*) beyond pre-event levels. Under this approach, the *deviation amplification model* (Aldwin, Sutton, & Lachman, 1996), *stress-inoculation theory* (Seery et al., 2010), FDM (Tedeschi & Calhoun, 1995; see section 2.6.1.1.), *organismic valuing theory* (OVT; Joseph & Linley, 2005), and the ACPM (Joseph, Murphy, & Regel, 2012; see section 2.6.1.2.) generally construe growth as a by-product of attempts to cope with adversity. Of these theories, only the *functional-descriptive model*, *organismic valuing theory* and *affective-cognitive processing model* explicitly address PTG.

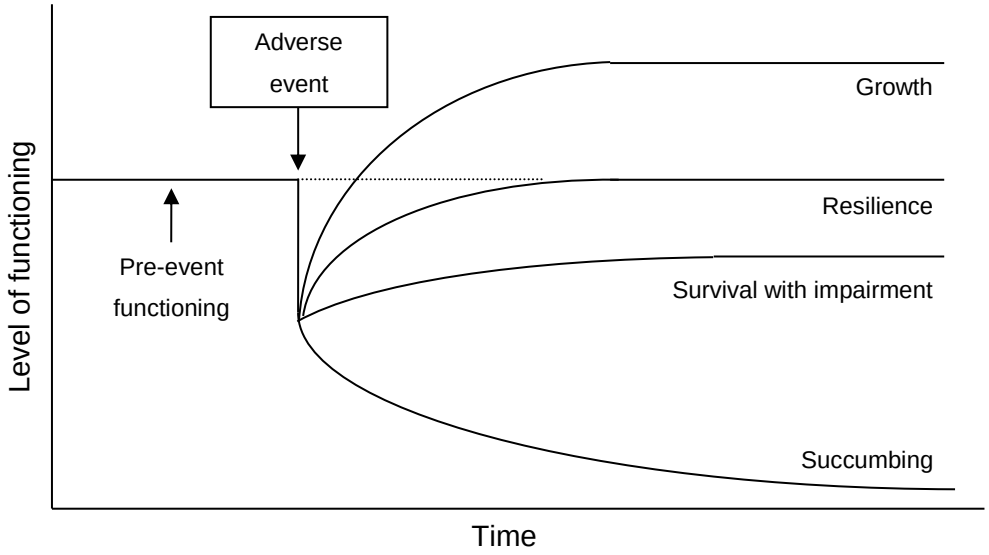

Figure 1. Potential responses to adversity (adapted from O'Leary & Ickovics, 1995).

2.6.1.1. Functional-descriptive model

The FDM, first proposed by Tedeschi and Calhoun (1995) and subsequently revised (Calhoun et al., 2010; Tedeschi & Calhoun, 2004), was the first theory that outlined the psychological processes responsible for PTG, and remains the most

comprehensive PTG theory at present. It is heavily influenced by *shattered assumptions theory* (Janoff-Bulman, 1992), which was originally developed to understand PTS symptoms. Briefly, *shattered assumptions theory* states that common assumptions about the world (e.g. that the world is benevolent) are disrupted following an adverse event. PTS symptoms manifest when people attempt to rebuild these 'shattered' assumptions in the aftermath of the event. Drawing upon this approach, the FDM, presented in Figure 2, similarly argues that adverse events perceived to be sufficiently seismic enough can destroy existing views about the self and the world. This can trigger automatic and intrusive rumination processes which may be distressing, but ultimately lead to more deliberate attempts to contemplate the meaning behind the event. This deliberate and more effortful form of rumination can promote the search for meaning. However, individual differences (see section 2.7.) may predispose some people to experience more growth than others.

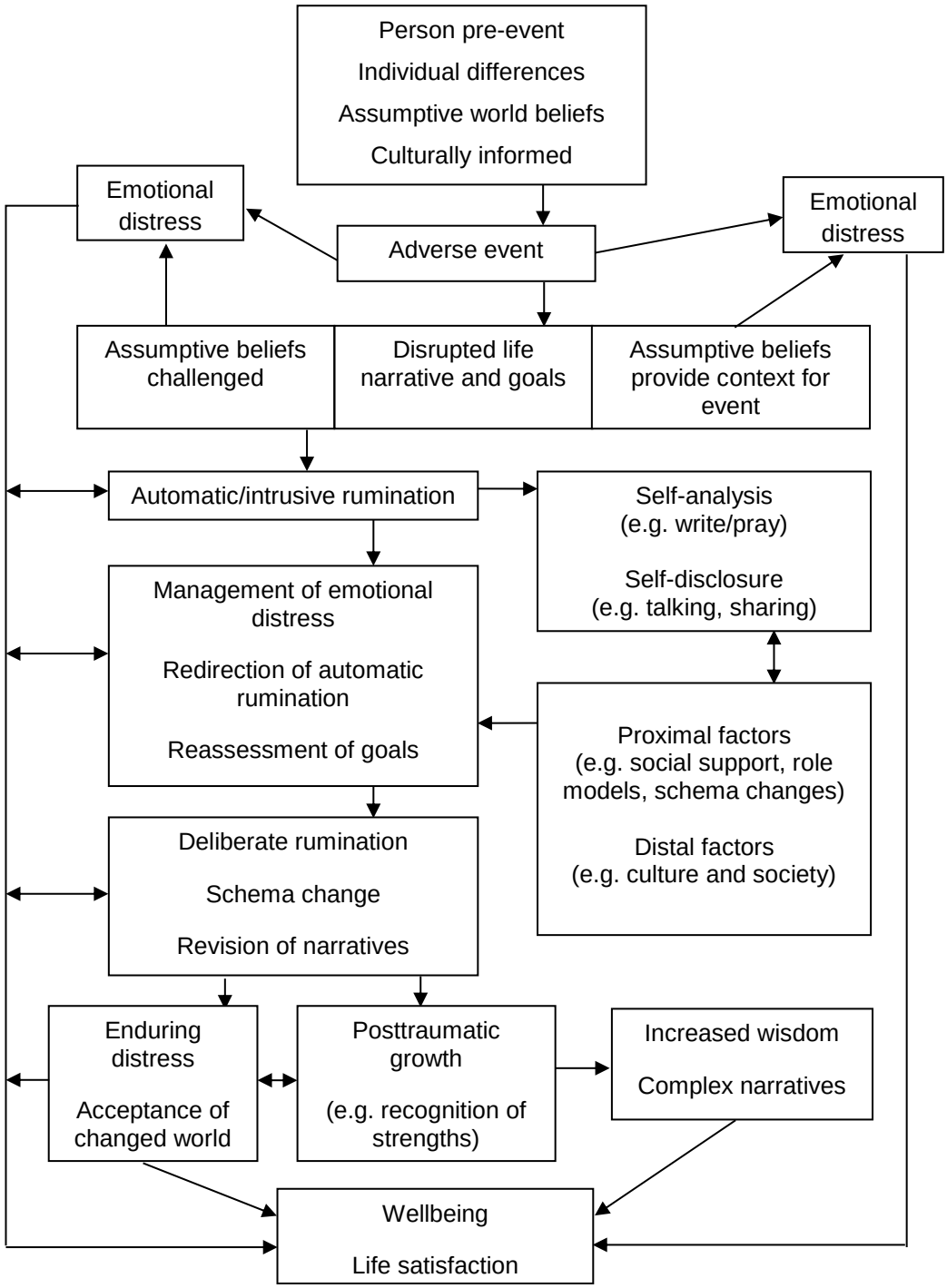

Figure 2. The functional-descriptive PTG model (adapted from Calhoun, Cann, & Tedeschi, 2010).

Although the FDM is primarily cognitive in nature, it is less focused on social and psychological factors related to PTG development. Tedeschi and Calhoun (2004) suggest that the transition from intrusive to deliberate forms of rumination (described in Chapter 7, section 7.3.) is aided by socio-cultural factors, such as social support and

coping (described in section 2.7.1.), which assist in the development of new post-event world views, known as schemas. In the context of the FDM, schemas are cognitive frameworks to interpret and organise information about the world. Social factors have been divided into *distal* and *proximal* influences, in which distal factors are seen as wider societal influences on the person, and proximal influences are those with whom the individual interacts (Cann et al., 2010). Together, these additional factors may make growth more or less likely.

Further, the FDM implicitly acknowledges that growth is not a solely positive experience. Following the emotional struggle with processing thoughts associated with the adverse event, people are said to become more acutely aware of their own vulnerability (Tedeschi & Calhoun, 2004). At the same time, knowledge that the individual has overcome adversity can facilitate the development of adaptive beliefs and other character strengths that enhance resiliency in the face of subsequent adversity (Calhoun et al., 2010).

Despite the dominance of the FDM in the literature, models that construe PTG as an outcome are not without limitation. The framework of Tedeschi and Calhoun (2004) is descriptive rather than explanatory in nature, and suffers from vague definitions of its underlying constructs (Zoellner & Maercker, 2006). This makes it difficult to establish empirical support for the observations within the model, as it is largely based on observations from the clinical experience of its creators. Therefore, while the assertions within the FDM are theoretically sound, there are few empirical investigations to validate the hypothesised relationships. However, the model's flexibility is an advantage in that it does not restrict empirical investigations to narrow definitions of underlying processes of PTG, which are a relatively new and poorly understood concepts. Despite its limitations, the FDM remains the most detailed account of PTG processes yet, and will therefore provide one perspective with which to interpret the findings of the empirical studies in this thesis.

2.6.1.2. Affective-cognitive processing model

Like the FDM, the ACPM, proposed by Joseph and colleagues (2012), also shares roots in the shattered assumptions framework (Janoff-Bulman, 1992). Unlike the FDM, this model is largely concerned with explaining the relationship between PTG and PTS in more detail, with more discussion of cognitive, social and emotional factors responsible for growth. Importantly, the ACPM assumes that PTS is a *normal* and natural reaction to adverse events, unlike literature that argues that PTS symptoms arise due to a failure to process information about the event (e.g. Ehlers & Clark, 2000).

The model, presented in Figure 3, suggests that the conflict between information about the adverse event and pre-existing world assumptions can trigger affective-cognitive processes needed for PTG. The ACPM is based on the earlier OVT, which assumes that people are innately driven to experience growth and enhance their wellbeing as they know what is best for themselves (Joseph & Linley, 2005). However, the ACPM goes further by drawing upon recent advances in the literature in respect of cognitive processing factors (see Chapter 7), by providing more detail as to underlying constructs implicated in PTG. Briefly, the ACPM distinguishes between ruminative brooding, characterised by repetitive thoughts that fail to find meaning, and more reflective thoughts that are conducive to PTG. This cognitive activity is theorised to relate to changes in positive and negative emotional states, which in turn influence cognitive activity in a mutual feedback cycle. This process, according to Joseph et al. (2012), is driven by a need to process the adverse experience, which is also influenced by various coping strategies and wider social and environmental factors (discussed in section 2.7.).

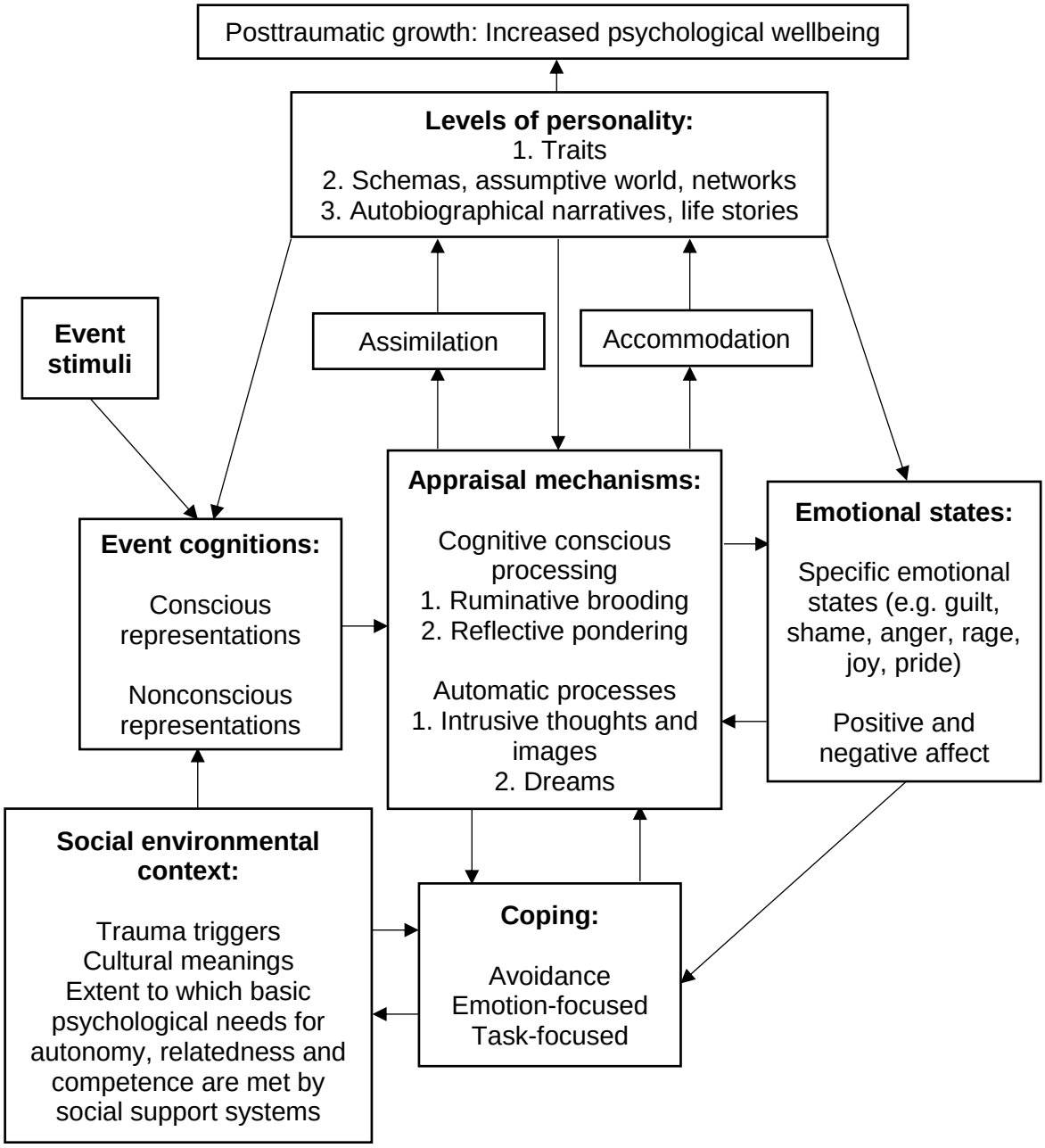

Figure 3. The affective-cognitive processing model (Joseph et al., 2012).

A key aspect of the ACPM is the focus on processes that sustain or inhibit PTG and PTS. New information about the adverse event must be either assimilated or accommodated into a person's shattered worldview (Joseph & Linley, 2005), known as a *completion tendency*, which can result in different outcomes. *Assimilation* occurs when a person wishes to maintain their pre-existing world assumptions by minimising distressing information about the adverse event, and can therefore potentially lead to future stress (Payne, Joseph, & Tudway, 2007). This may be exemplified by statements such as "bad things happen to bad people, so I deserved this". *Accommodation* refers to

the process of modifying existing assumptive views in order to incorporate new information about the adverse event. Information can be positively or negatively accommodated; *positive accommodation* is thought to be more closely related to PTG (e.g. “I feel stronger after dealing with this”), while *negatively accommodated* thoughts (e.g. “the world is a dangerous place”) are aligned with distress (Joseph et al., 2012; Payne et al., 2007). Thus, the ACPM provides one potential explanation for relationships between PTG and PTS (see section 2.7.2.) as people “work through” their experiences (Joseph et al., 2012; p. 320).

The ACPM, like the FDM, is also largely based on evidence gathered through clinical observations, rather than systematic research. However, this thesis also adopts this model because it attempts to differentiate between types of cognitive processes responsible for PTG, which appear to have some evidential basis (see Chapter 7, section 7.3.). In doing so, the ACPM is more explicit in its awareness of cognitive processes which explain why some people are more vulnerable after adversity than others. Furthermore, the ACPM is more sensitive in its attention to the social and environmental context in which people exposed to adversity find themselves. This also includes references to specific coping and affective states, which are not explicitly acknowledged in the FDM.

2.6.2. Posttraumatic growth as a coping process

The second theoretical conceptualisation of PTG is that of a coping strategy in response to adversity. Falling within this approach, *cognitive adaptation theory* (Taylor, 1983)*, action-focused growth* (Hobfoll et al., 2007) and the *meaning making model* (Park, 2010) do not deny the presence of PTG, but view growth as a palliative response to threatening life events, rather than an independent outcome of adversity. In the case of the *Janus-face model* (JFM; Maercker & Zoellner, 2004; see section 2.6.2.1.)*,* PTG is construed as being both an outcome *and* a coping strategy associated with the emotional struggle with adverse life events. The JFM also includes elements of the aforementioned

theories proposed by Taylor (1983), Hobfoll et al. (2007) and Park (2010) into a more organised framework, hence the reason for its inclusion. It is also the only model that outlines the distinct functions that growth may serve for people.

2.6.2.1. Janus-face model

The third perspective adopted in this thesis is the JFM, proposed by Maercker and Zoellner (2004) and subsequently elaborated in later work (Zoellner & Maercker, 2006). The model, depicted in Figure 4, was developed in response to concerns regarding the function of PTG and the extent to which it is related to improvements in wellbeing (Affleck & Tennen, 1996). The JFM attempts to bridge two perspectives that view PTG as actual positive change (e.g. Tedeschi & Calhoun, 2004) or an adaptive coping strategy (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). Within the JFM, the *constructive* side is said to reflect *actual* change. Constructive PTG is correlated with healthy adjustment, and is widely researched in the literature (see section 2.7. for factors argued to relate to *actual* growth). However growth is also assumed, in part, to have an *illusory* or self-deceptive quality, which may mask emotional distress (Zoellner & Maercker, 2006). While few studies have explored this aspect of PTG, existing research finds the perception of PTG to be associated with distorted views of the self, such as 'unrealistic' optimism (Taylor, 1983) and avoidance coping (Cheng et al., 2006). These strategies may be employed in the face of threat to reduce distress and are not necessarily pathological. In fact, positive illusions are a common characteristic of human thought that can be employed on a daily basis, allowing individuals to sustain relationships, maintain a perception of happiness and continue within productive employment or creative work (Nadelhoffer & Matveeva, 2009; Taylor & Brown, 1988).

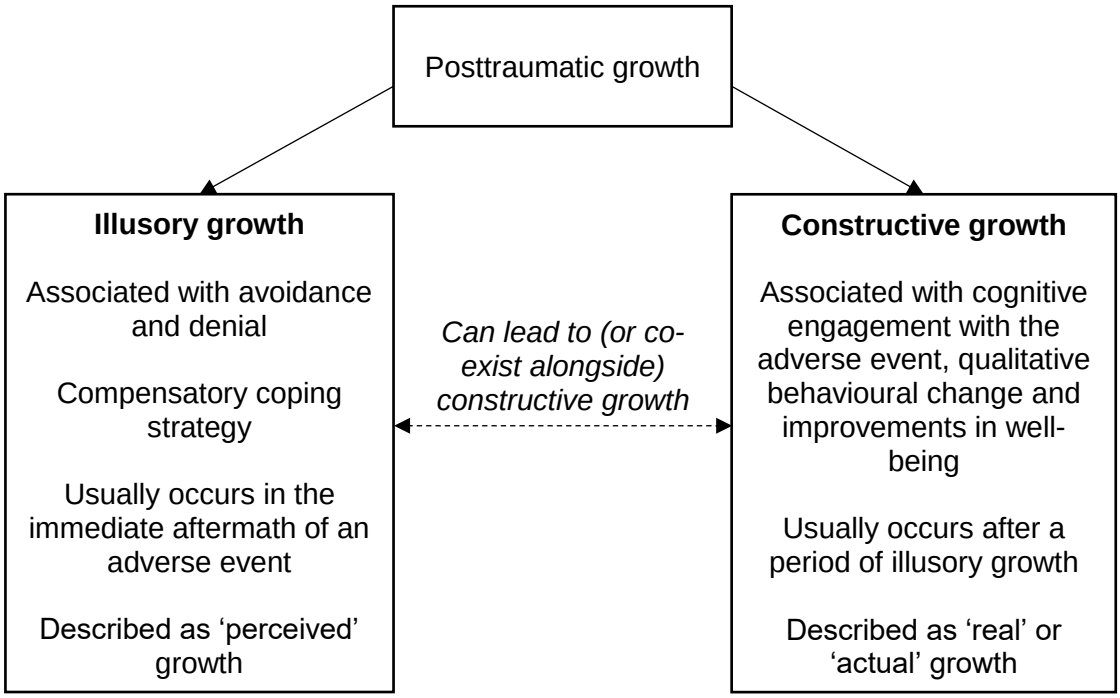

Figure 4. Representation of the Janus-face model (Maercker & Zoellner, 2004; Zoellner & Maercker, 2006).

Some empirical studies have provided support for the JFM, although wider empirical evidence to support the model is currently limited. Frazier and colleagues (2009) explored whether perceived PTG was related to actual PTG. These two concepts were measured using the PTGI (Tedeschi & Calhoun, 1996) and a modified version of the PTGI respectively, with the latter concept also measured using questionnaires that mapped onto the five dimensions of growth, such as social support measures (see section 2.4.). Interestingly, they found that perceived growth was associated with increased distress, whereas actual growth was related to decreased distress. This suggests that perceived and actual growth reflect different processes, where perceived growth corresponds to illusory PTG, and actual growth to more constructive forms of PTG.

Additionally, the constructive and illusory facets of PTG are thought to operate on different time courses. The illusory side of growth may be present in the immediate aftermath of an adverse event (Maercker & Zoellner, 2004). In this context, illusory growth may be construed as an adaptive response to reduce distress if this is only

present in the short-term, and co-occurs with cognitive attempts to think about the event (see Chapter 7, section 7.3.2., for discussion of deliberate rumination). According to the JFM, illusory growth persisting for an extended period of time may constitute denial of the adverse event, which can have detrimental effects on wellbeing, in the form of PTS. In contrast, the constructive aspect of PTG is argued to emerge after some time, and is associated with long-term positive improvements to wellbeing (Zoellner & Maercker, 2006). This may include cognitive attempts to engage with the meaning behind the event, and qualitative changes in behaviours (Hobfoll et al., 2007). Therefore, this model is advantageous as it provides some insight into the discrepant results observed between PTS and PTG in cross-sectional and longitudinal studies (see section 2.7.2. for discussion). Furthermore, Zoellner and Maercker (2006) posit various coping responses that may be related to constructive PTG and improved wellbeing in the long-term, such as increased active coping, while others, such as avoidant coping, may be aligned with illusory growth. The extent to which these factors are related to constructive and/or illusory PTG is discussed in longitudinal Study 4 (section 9.7.).

The JFM, alongside the FDM and ACPM, partly relies on clinical observations to justify conceptual relationships, and with the exception of some recent studies that have operationalised aspects of the JFM (Pat-Horenczyk et al., 2015, 2016; discussed in Study 4, section 9.7.), the JFM lacks wider empirical validation. Yet, the model provides some interesting hypotheses about the nature of PTG which have implications for psychological adjustment after adversity. For example, knowledge of factors that are associated with the illusory and constructive aspects of PTG could inform more targeted clinical efforts to promote enhanced wellbeing. Furthermore, the inclusion of the JFM within this thesis is justified as it emphasises the illusory aspect of PTG, which does not receive such attention in the FDM and ACPM frameworks.

2.6.2.1. Summary of theoretical approaches

Together, the three theories approach PTG from slightly different perspectives. The FDM and ACPM argue that PTG is an outcome of adversity, with the FDM offering a comprehensive conceptual framework of PTG development, and the ACPM hypothesising potential pathways to growth and distress, as well as more detail in respect of wider social and environmental factors conducive of growth. In contrast, the JFM views growth as both a coping strategy and outcome of the struggle with adverse events. In addition, the JFM attempts to bridge concerns surrounding the validity of the PTG concept and its impact on psychological adjustment. Given the lack of overwhelming support for either perspective, this thesis approaches the study of PTG in an open mind, such that it may be *both* a process and an outcome associated with the struggle with adverse events.

When combined, the FDM, ACPM and JFM share some common tenets. Intrinsically, they all assume that: (1) people possess orienting systems which help them to interpret their experiences; (2) adversity has the potential to challenge an individual's perceptions about the world; (3) some degree of distress is a necessary part of the PTG experience; and (4) if people are able to integrate these discrepant beliefs, then this will lead to enhanced psychological adjustment and wellbeing. In addition, all three models acknowledge the temporal nature of growth, at least implicitly.

However, our knowledge of PTG is limited by gaps in knowledge that are not accounted for by these models. First, the existing models cannot fully explain the exact mechanisms and processes by which PTG changes (if at all) according to the objective characteristics of the event experienced (studies 1, 2 and 4). Second, they do not address other possible social and cognitive factors responsible for growth (studies 2, 3), nor account for factors that influence changes in PTG over time (see Study 4). Third, relationships between factors within the models are primarily theoretical, and research has not yet sufficiently verified the claims made to establish whether apply to all people's

experiences of PTG. However, while all three theories require further empirical support, the absence of alternative, comprehensive and empirically-validated PTG models means that combining these theories can provide a more thorough way to investigate changes associated with positive transformation.

2.7. Factors studied in relation to posttraumatic growth

In the past two decades, a plethora of studies have identified a range of factors thought to be related to the development of PTG. These broadly include psychosocial coping and social support factors and PTS. Less research has focused on identifying specific characteristics of the adverse event that could be more (or less) conducive to growth. More recently, attention has been given to specific types of cognitive factors implicated in PTG, and these are discussed separately in Chapter 7 due to the emerging findings in Study 2.

2.7.1. Psychosocial characteristics

In this thesis, psychosocial characteristics refer to coping, social and environmental factors that can influence a person's recovery after adversity. Active, avoidant, emotional, and spiritual or religious coping strategies have been discussed in relation to PTG, with different relationships observed. Furthermore, the role of social support has also been investigated. These concepts are discussed in more detail below.

2.7.1.1. Active coping

Active coping methods, also known as *problem-focused* and *approach coping* (Schaefer & Moos, 1998), have generally demonstrated strong positive relationships with PTG and negative relationships with PTS in the literature. Active coping is overwhelming construed as an adaptive strategy that attempts to remove or reduce the effects of a stressor by addressing the root of the problem (Folkman & Moskowitz, 2004). This can include learning new skills to manage the problem, or taking control of the situation. A 30-year longitudinal study found that prisoners of war who reported more active coping

skills also endorsed greater PTG and fewer PTSD symptoms (Dekel, Mandl, & Solomon, 2011). Alongside active coping, acceptance of the event and attempts to positively reframe one's experiences are also linked to increased PTG (Schaefer & Moos, 1998; Zoellner & Maercker, 2006). The FDM, ACPM and JFM agree that active coping methods can be beneficial to the development of constructive PTG following adversity, as it involves trying to analyse the situation logically and taking action to solve the crisis (Joseph et al., 2012; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006).

2.7.1.2. Avoidant coping

In contrast to active coping methods, avoidant coping is generally framed as a 'maladaptive' response to stress that can perpetuate further psychological difficulties if unresolved (Folkman & Moskowitz, 2004). Avoidance coping corresponds with attempts to deny or minimise the effects of the adverse event. Examples of avoidance can include denial, distracting oneself from thoughts about the event, or engaging in substance misuse (Carver, Scheier, & Weintraub, 1989). Compared to active coping, avoidant coping has received more attention in the PTS rather than PTG literature, as it has been shown to sustain pathological symptoms and inhibit recovery from stressful life events (Held, Owens, Schumm, Chard, & Hansel, 2011). However, avoidance coping has demonstrated mixed results with PTG; in which some studies find both constructs are positively related to another (Hallam & Morris, 2014; London, Mercer, & Lilly, 2017), and others demonstrate negative relationships (Wild & Paivio, 2004). These findings are important because a positive relationship between PTG and avoidance coping could suggest the individual has not fully processed the emotional impact of the event, and thus provide evidence of an illusory coping strategy (Zoellner & Maercker, 2006). Conversely, a negative relationship would support the constructive side of PTG, according to the JFM. However, wider empirical support to explore the relationship between avoidance coping and PTG is limited at present.

2.7.1.3. Emotional coping

Emotional-focused coping is construed as a strategy to ameliorate the negative effects of an adverse event (Folkman & Moskowitz, 2004). Example strategies may include venting of negative emotions, expressing feelings in diary format, and seeking emotional support. Psychological responses to adverse events can involve emotional processing of memories attached to the experience (Foa, Huppert, & Cahill, 2006). Traditionally, emotional strategies to cope with stress have been construed as entailing a negative focus on the event which (Litman, 2006), which may explain why limited investigations have explored the contribution of emotional coping on PTG development. For example, difficulties in emotional processing have been usually related to greater distress (Ehring & Quack, 2010). However, recent research finds that emotional coping can allow survivors to make sense of their experience. A study of 107 adult women who experienced a range of adverse events reported positive associations between meaning making, emotional processing and PTG (Larsen & Berenbaum, 2015). This may evidence a potentially functional role for emotional coping within the PTG process.

2.7.1.4. Religious and spiritual coping

Multiple studies find that greater religious or spiritual belief is associated with the perception of positive changes after adversity (Prati & Pietrantoni, 2009; Shaw et al., 2005; Tedeschi & Calhoun, 1996). Religion can provide a source of comfort, meaning or purpose to a person's experiences, and a sense of intimacy with others through engagement with religious activities (Brewer, Robinson, Sumra, Tatsi, & Gire, 2015; Pargament, 2001). In addition, having a secure relationship with a God and the belief that meaning can be found in adverse experiences, is more likely to relate to PTG. A large study of 1,016 undergraduate students revealed that those who held favourable appraisals of religion, and sought religious support and forgiveness experienced more PTG (Gerber, Boals, & Schuettler, 2011). In contrast, spiritual discontent and punitive appraisals of religion, were related to PTSD. The emotional struggle with adverse events can lead to spiritual struggles in which the role of religion is questioned, although this is

not always reflected in PTG literature. Adverse events may lead to doubts or uncertainties over one's purpose in life and anger or a sense of abandonment towards a God, which is associated with more distress (Pargament, 2001). At the same time, evidence indicates that spiritual struggles can be associated with more PTG. One study of Judeo-Christian clergymen found that those who reported higher levels of both positive and negative religious coping experienced greater growth (Proffitt, Cann, Calhoun, & Tedeschi, 2007). This appears consistent with the idea that PTG involves some degree of distress identified within the three theoretical approaches in this thesis (see section 2.6.).

The finding that religious and spiritual coping leads to more PTG is not universal. Some studies have found negative associations with growth (Rzeszutek, Oniszczenko, & Firląg-Burkacka, 2017). Blaming a God or other-worldly force could inhibit PTG as it shifts responsibility away from the individual and strengthens passivity in the face of adversity (Pargament, 2001). Equally, moral attitudes regarding certain events (e.g. HIV/AIDS) displayed by some religious communities could be viewed as stigmatising, which may also prevent a reliance on religious coping (Zou et al., 2009). The reliance on spiritual or religious coping is also dependent on the wider sociocultural context. In some societies, particularly secular European states where atheistic beliefs are increasing (Calhoun et al., 2010), religion and spirituality may not be implicated in PTG for some people. For atheists, there may not be an emotional struggle as there is no God, although existing research is largely based on American samples which have majority theistic beliefs (Calhoun et al., 2010). It seems however that religion and spirituality can provide a valuable resource and source of comfort for some people, while spiritual struggles can lead to more distress and growth.

2.7.1.5. Social support

Common to the FDM and ACPM frameworks is the inclusion of social factors in shaping PTG outcomes. The vast majority of studies find that increased levels of social support are associated with more PTG, evidenced by research on those who have

experienced sexual assault (Frazier, Tashiro, Berman, Steger, & Long, 2004), cancer (Morris & Shakespeare-Finch, 2011) and a weak positive relationship (r = .26) being identified in a meta-analysis of 103 PTG studies (Prati & Pietrantoni, 2009). In contrast, a lack of social support is generally associated with poorer adjustment and distress, including PTSD symptoms (Ullman & Peter-Hagene, 2014). It is theorised that social support can provide opportunities for emotional disclosure, and allow people who have experienced adversity to adopt new perspectives that are necessary to modify world views (Tedeschi & Calhoun, 2004).

However, some studies find no association between social support and PTG (e.g. Sears, Stanton, & Danoff-Burg, 2003), or that it is only related to one index of PTG (*relating to others*; Cieslak et al., 2009; see section 2.4.4.). It may be that the use of social support depends on other factors, such as depression and physical health problems (Schmidt, Blank, Bellizzi, & Park, 2012), reactions to disclosure (Calhoun & Tedeschi, 2014; see Study 2, section 6.4.2.4.) or the type of adverse event experienced (see Study 1b) which may inhibit the use of such support, although the latter two explanations remain untested. With regard to these two explanations, existing evidence indicates that individuals with social support are likely to differ in many salient ways compared to those who lack support, regardless of the current experience of an adverse event. For example, people with strong social support networks are more likely to have a greater sense of mastery, self-esteem and higher level of psychological functioning, unlike those with less social support (Hobfoll, 2002). These factors may serve a protective function against any potential negative symptoms from adverse events, which could influence the degree of PTG reported.

Alternatively, there may be challenges in the measurement of social support. It is not uncommon for individuals to overestimate perceptions of social support in the PTG literature (Nenova, DuHamel, Zemon, Rini, & Redd, 2013). These appraisals may not reflect the support that is actually available, but are rather a way to buffer against stress (Lakey & Cohen, 2000) and evidence of distorted perceptions symbolic of illusory PTG

(Zoellner & Maercker, 2006). Another possibility is that PTG studies use different measures of social support, meaning that differences in social support could be an artefact of the measurement tools. Furthermore, other research relies on unvalidated measures (e.g. Sears et al., 2003), making accurate comparisons difficult. Therefore, while most studies find that social support can influence PTG, discrepant findings indicate that the circumstances under which social support is beneficial remain largely unknown.

2.7.2. Posttraumatic stress

A considerable amount of literature has sought to explain relationships between PTG and PTSD symptoms, because of the latter's chronic and debilitating nature. Understanding the association between growth and distress maps onto the aims of positive psychology more broadly, that is, to integrate knowledge of the positive and negative aspects of human experience (see sections 2.2. and 2.3.2.). According to the DSM-V (American Psychiatric Association, 2013), PTSD refers to a broad cluster of four primary symptoms: avoidance, hyperarousal, intrusions (discussed in more detail in Chapter 7, section 7.3.), and negative cognitions and mood. Unlike avoidant coping styles which refer to a general tendency to engage in avoidant behaviours and thoughts (see 2.7.1.2.), avoidance in the context of PTSD generally relates to attempts to minimise distressing cognitions, specifically, thoughts, feelings or reminders of the experience. Hyperarousal can refer to increased irritability and aggression, as well as difficulties concentrating and sleeping following adverse events. Intrusions may be experienced through nightmares, flashbacks and unwanted thoughts about the event. Negative mood changes can include self-blame, negative affect, decreased enthusiasm in activities, and negative emotions about the world, such as pessimism. For a diagnosis of PTSD, people should experience at least one symptom from each of the four clusters for at least one month, causing impairments to everyday social and occupational functioning (American Psychiatric Association, 2013; Pai, Suris, & North, 2017). The DSM-V asserts that these symptoms should not arise through substance use, medication or other illness.

Three conflicting associations have been proposed between growth and distress. First, some research suggests a positive relationship between PTG and PTS, evidenced by cross-sectional findings in students (Bensimon, 2012) and survivors of a terrorist attack (Blix, Hansen, Birkeland, Nissen, & Heir, 2013), as well as longitudinal investigations among hurricane survivors (Lowe et al., 2013) and cancer patients (Danhauer et al., 2013). For example, a study of former prisoners of war (Dekel, Ein-Dor, & Solomon, 2012), found that positive changes increased alongside distress over a 17-year period. In addition, a meta-analytic review of 42 studies (Shakespeare-Finch & Lurie-Beck, 2014) revealed that reports of PTG increased alongside symptoms of PTS (r = .31) in a linear fashion, although the curvilinear relationship was stronger r = .37 (discussed in subsequent paragraphs). At the same time, there was significant heterogeneity among the sampled studies, indicated by significant Cochran's Q tests. The relationship varied according to the type of adverse event. Stronger linear PTG-PTS relationships were observed in military and conflict zone samples, and weaker relationships in studies of people who had experienced illnesses, sexual abuse, or those assessing a wide variety of adverse events. However, these discrepant findings may be explained by the power from larger sample sizes in the military and conflict zone studies. Yet, the overall finding from the Shakespeare-Finch and Lurie-Beck (2014) meta-analysis would be consistent with the FDM and ACPM theories (Joseph et al., 2012; Tedeschi & Calhoun, 2004) where some degree of distress is necessary for growth. Collectively, this evidence suggests that growth and distress can co-exist over time.

Second, other investigations have found that growth and distress are inversely related. In their study of earthquake survivors, Chen, Zhou, Zeng and Wu (2015) found that increased PTG 12 months after the event was associated with fewer PTS symptoms. Similarly, 171 survivors of sexual assault who experienced PTG at two and 12 weeks post-assault also reported the least distress 12 months after the event (r = -.31; Frazier et al., 2001). This evidence would indicate that growth and distress lie at opposite ends of the continuum of responses to adverse events. This would offer partial support to the

FDM, ACPM and JFM frameworks which assume that growth and distress may be intertwined initially, although constructive growth may emerge later as PTS symptoms decrease (Joseph et al., 2012; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). However, studies reporting negative associations tend to rely on unstandardised measures of PTG; Frazier et al. (2001) and Chen et al. (2015), used self-derived growth measures with no wider empirical validation. Therefore, the findings from these studies should be treated cautiously.

The third and final finding is that PTG may be unrelated to PTS. For example, Kashdan and Kane (2011) reported no relationship (r = -.04, Cohen's f^2 = .01) [5] between PTG and PTSD symptoms within a college student sample (N = 176) with at least one adverse event. One small longitudinal investigation of 55 cancer survivors revealed no relationships between growth and distress at the three-month follow-up (Cohen's f^2 = .00; Salsman, Segerstrom, Brechting, Carlson, & Andrykowski, 2009), mirroring results observed (r = -.10)[6] in some cross-sectional studies of cancer survivors (e.g. Cordova, Cunningham, Carlson, & Andrykowski, 2001). This would imply that growth may be an outcome independent of distress. However, such findings may also be an artefact of the small sample sizes which hamper investigations of long-term adjustment.

While the relationship between growth and distress is identified as linear in a majority of studies, a smaller number report non-linear associations. Among survivors of physical assault (Kleim & Ehlers, 2009), breast cancer (Lechner, Carver, Antoni, Weaver, & Phillips, 2006) and terrorist attacks (Butler et al., 2005), those who endorse a 'moderate' level of PTS symptoms also report the highest PTG. In fact, the meta-analysis of Shakespeare-Finch and Lurie-Beck (2014) showed that the curvilinear relationship was significantly stronger than the linear relationship overall (r = .37). When graphed,

[5] Cohen's f^2 was calculated by the researcher using online software (Soper, 2016b) to allow for comparison of effect sizes in multiple regression where the R^2 value was provided. f^2 values near to .02 are considered small, with values near .15 representing medium effects, and values of .35 and above indicating large effect sizes (Cohen, 1988).

[6] The authors of this study did not include this variable in the multiple regression as it was not significant, hence f^2 could not be calculated.

this relationship displays a quadratic (inverted 'U' shape) trend, suggesting that associations between these two constructs are more complex. It may be that some degree of distress is needed to initiate growth, but not to the extent that it overwhelms a person's ability to naturally process the event.

2.7.3. Adverse event characteristics

An implicit assumption of the three theories previously discussed (section 2.6.) is that it is not so much the event itself, but the emotional struggle in coming to terms with adverse events that can be conducive to PTG. In doing so, this downplays the role of adverse event characteristics, which will be used as a collective term in this thesis to refer to the frequency, type and developmental timing of events. However, Tedeschi and Calhoun (1995) speculated that "individuals facing one kind of difficulty" may evidence different levels of growth to those "facing difficulty of a different kind" (p. 118). Meanwhile, the JFM states that adaptation may vary according to different events. Both claims have not received sufficient empirical attention. This section will discuss the limited research on event characteristics and PTG in more detail, as this will serve as one focus of the empirical studies in this thesis (see Chapter 3, section 3.2. for research questions).

2.7.3.1. Subjective event severity

Subjective interpretations of event severity have been researched to a far greater degree than the frequency, type or timing of the adverse event. According to leading PTG theories such as FDM and ACPM, events that are perceived as more severe will lead to more growth (Joseph et al., 2012; Tedeschi & Calhoun, 2004). In other words, the event has to be of a severity that will shatter world assumptions to bring about a rebuilding of core beliefs, in which PTG can emerge. Literature has consistently supported this view, evidenced by findings from motor vehicle accident survivors (Zoellner, Rabe, Karl, & Maercker, 2008), police officers (Chopko, Palmieri, & Adams, 2016) and a wider meta-analysis of 87 studies (Helgeson et al., 2006) that found elevated perceptions of severity to be associated with greater PTG (r = .14, p < .001).

2.7.3.2. Number of event types

Before the relevant literature is presented, it is important to note that this thesis acknowledges the distinction between a person experiencing *repeat* events, those who experience different *types* of event, and the *number* of events experienced. Repeat exposure to adverse events is a common term in the victimology literature, referring to a person who is repeatedly exposed to the same event (such as intimate partner violence) by the same perpetrator (Farrell & Pease, 2001). However, this thesis considers a more flexible interpretation by accounting for the different *types* of events that people may experience in their lifetime. Existing literature strongly suggests that when studies invite participants to record their cumulative adversity history, people often endorse different types of events over their lifetime (Kira et al., 2013; Schumm, Briggs-Phillips, & Hobfoll, 2006; Seery et al., 2010), although this is not a focus of most PTG investigations (see below paragraphs for discussion). The distinction between repeat and multiple forms of adversity is important, because each type of adverse event can exert different effects on psychological adjustment and require different treatment needs (Breslau, Chilcoat, Kessler, & Davis, 1999; Cloitre, 2015).

Examining the extent to which people experience multiple *types* of events should not be confused with the *number* of individual events. A great difficulty in the literature concerns the measurement and quantification of the 'dose' of adversity a person has experienced (Wilker et al., 2015). Some studies use the *frequency* of events as an index for cumulative exposure (e.g. Peterson, Park, Pole, D'Andrea, & Seligman, 2008), others refer to the number of *different types* of events (e.g. Finkelhor, Turner, Hamby, & Ormrod, 2011), and some studies incorporate a combination of both (e.g. Kira et al., 2008). For example, it would be extremely difficult for a survivor of prolonged childhood sexual abuse or intimate partner violence to identify the number of separate times they were victimised, as both types of event are less likely to be an isolated occurrence (Follette, Polusny, Bechtle, & Naugle, 1996). In addition, the survivor may record either event on a checklist of adverse incidents, but it would not be clear as to whether they were

referring to a single circumscribed event or multiple incidents. Therefore, the measurement of different *types* of events is considered a more reliable index than the *number* of events, with the former approach adopted in several studies (e.g. Neuner et al., 2004; Wilker et al., 2015). It was reasoned that some people may have experienced an event so many times that it would be difficult to report the event frequency, and so the decision was taken to focus on the number of different *types* of events experienced throughout this thesis.[7]

The literature on PTS increasingly finds that those reporting multiple types of exposures endorse more negative changes than those who experience single, isolated events (Casey & Nurius, 2005; Green et al., 2000; Hagenaars et al., 2011; Suliman et al., 2009). This can apply to exposure to multiple events of the same type, or across event types. One of the earliest studies to address the impact of cumulative adversity (Follette et al., 1996), found that 73% of the female sample experienced at least one adverse event, including child sexual abuse (49%), adult sexual assault (17%) and intimate partner violence (55%). Results indicated that those with three different event exposures reported more depression, anxiety and PTS symptoms than those with no or single exposures. Since then, cumulative impact of events has been framed variously in different contexts as *complex trauma* (Herman, 1992), *polyvictimisation* (Finkelhor et al., 2011) and *developmental trauma disorder* (Stolbach et al., 2013), but all share the key idea that experiencing multiple types of adverse events can have detrimental impacts on psychological functioning compared to single or isolated events.

By comparison, there has been a paucity of PTG research that acknowledges the impact of multiple types of events on perceptions of growth. The limited studies that have taken place have revealed mixed findings. Some research finds that PTG is positively related to the experience of multiple adverse events. In their study of 132 civilians living in a conflict zone, Kira et al. (2013) found that those who experienced multiple types of

[7] Study 4 had a prospective design and so it *was* possible to account for the number of events in each six-month period as opposed to an entire history. Further details are presented in Study 4.

events also endorsed the most PTG (r = .23, p < .05). However, other studies find that PTG is unrelated to the experience of multiple types of adverse events (Kılıç et al., 2016). Kılıç and colleagues (2016) study of 203 war-exposed civilians found that levels of growth were similar regardless of the number of types of events experienced (r = .05); rather, it was the type of event that was a significant indicator of PTG (see section 2.7.3.3.). As so few PTG studies of multiple events exist, further empirical investigation is needed to confirm how frequent adversarial exposure influences growth, if at all.

A weakness of the existing PTG and PTS literature is that the vast majority of studies tend to group survivors based on a homogenous event, such as cancer (Tobin et al., 2017), earthquakes (Xu & Liao, 2011), HIV/AIDS (Milam, 2004), physical assault (Kleim & Ehlers, 2009) and sexual assault (Frazier et al., 2001). This does not reflect the diverse range of exposures individuals may experience over the lifetime. In fact, experiencing multiple types of events is the norm in epidemiological studies (Kilpatrick et al., 2013), where approximately 89.7% of 2,953 individuals were exposed to at least one adverse event, with three separate exposures being the most common. Other studies, also using large samples (N = 2,398), find that people can report an average of seven different events in their lifetime (Seery et al., 2010). Therefore, studies acknowledging that individuals can experience multiple types of events would better correspond with people's experiences of adversity across the lifespan.

Furthermore, psychological responses to adverse events are a highly individualised and subjective experience. As such, people do not experience the same event identically (Milchman, 2016; Seery et al., 2010). Some people may experience positive changes following an experience of physical assault, whilst others may find the same event highly debilitating. Differences in the subjective interpretation of events may be a function of coping styles (see section 2.7.1.) or cognitive processing (see Chapter 7), although psychological processes in response to cumulative events are largely unknown. Thus, recognising the impact of multiple types of events is important to not only understand the negative psychological burden placed upon people, but to also

explore how some people can use their cumulative experiences for positive transformation.

2.7.3.3. Type of event

Few PTG studies have examined whether the type of event experienced can lead to more (or less) growth. The literature makes a broad distinction between *interpersonal* and *non-interpersonal* events, demonstrating different effects on psychological functioning. Interpersonal events are deliberately perpetrated acts by one person towards another, or where there is usually an intent to cause harm through a specific act (Mauritz, Goossens, Draijer, & van Achterberg, 2013). These events may include emotional, physical or sexual abuse and neglect in childhood or adulthood, military conflict and terrorism. In contrast, non-interpersonal events are those that are usually outside of the control of humans, are not premeditated, and are regarded as less personal. These events include natural disasters, accidents and serious illness (Fischer, Dölitzsch, Schmeck, Fegert, & Schmid, 2016). A robust finding in the literature is that interpersonal events are strongly associated with a range of functional impairments, including mental health complications such as PTSD, emotion dysregulation and interpersonal difficulties (Briere, Hodges, & Godbout, 2010; Martin, Cromer, DePrince, & Freyd, 2013), compared to non-interpersonal exposures which result in less severe and diverse outcomes (Ehring & Quack, 2010). The type of event thus seems to influence the severity of negative psychological adjustment in those experiencing adversity.

In contrast to literature on negative changes, PTG theory and research in respect of adversity types on PTG development is under-developed. Recent systematic reviews (Elderton et al., 2017; Ulloa et al., 2016) note that PTG research on interpersonal events is in its infancy. It placed the average prevalence rate of PTG in survivors of interpersonal events at around 71%, and as such it is not a universal experience. Some studies find that growth is generally lower in adults who report rape and torture (Kılıç, et al., 2016), and higher following non-interpersonal events, such as bereavement (Shakespeare-Finch & Armstrong, 2010) and among firefighters dealing with hurricane damage (Kehl,

Knuth, Hulse, & Schmidt, 2015). Thus, interpersonal events may be more likely to overwhelm the survivor's ability to experience PTG compared to acts of nature. However, this distinction is not always found; some studies report PTG as independent to the type of event; Kira and colleagues (2013) found growth was unrelated to sexual assault and childhood neglect in a civil conflict-exposed sample, although the reasons for this inconsistency are unclear. Currently there no explanations as to why growth may be restricted in response to certain events, so if this is a salient factor, it requires further investigation.

2.7.3.4. Developmental timing of events

It has been established that childhood adversity is generally linked to poorer adjustment compared to events experienced in adulthood. Childhood adversity can be associated with interpersonal difficulties, greater PTS symptoms and disruption to healthy coping skills that regulate responses to significant life events (Courtois, 2008; Finkelhor et al., 2011; Freyd, 1994). A study of adults in the community found that those who reported adversity in their formative years reported lower subjective happiness compared to people who experienced their most distressing adverse event in adulthood (Ogle et al., 2013), suggesting outcomes differ according to the timing of the events. While the effects of childhood adversity are well-documented, it is still unclear why childhood adversity predisposes individuals to poorer outcomes than adversity in adulthood. Neuroplasticity explanations would argue that childhood adversity could lead to structural changes in areas of the brain associated with physical and emotional responses (Lupien, McEwen, Gunnar, & Heim, 2009). Other explanations suggest that PTS symptoms from childhood adversity create an "enduring vulnerability" (p. 95) that manifests in helplessness and cognitive predispositions, which are in turn associated with more severe psychological responses to adverse events in adulthood (Breslau et al., 1999). Thus, the developmental context may be necessary to understand individual responses to adverse life events.

By comparison, few PTG studies have specifically examined the extent to which adversity experienced in childhood is related to growth in adulthood. Available evidence suggests that survivors of child sexual abuse (Woodward & Joseph, 2003) or cancer (Gunst, Kaatsch, & Goldbeck, 2016) can report PTG in relation to their childhood experiences when assessed in adulthood. However, it still remains unclear how childhood adversity impacts on adulthood PTG, as these studies have not systematically examined a range of psychosocial factors that enable people to report more growth.

2.7.4. Chapter summary

This chapter provided an overview as to the current state of the PTG literature. PTG is part of the wider positive psychology movement, aiming to bring about a more balanced perspective of human adjustment following adverse life events. The opportunity to explore positive changes after adversity is an exciting new phenomenon, although as a relatively new area for research, PTG still remains poorly understood. As highlighted in this chapter, scholars disagree and findings are ambiguous on many aspects of PTG. The psychological processes by which PTG occurs as outlined in the FDM and ACPM models require further empirical testing, as they may not reflect all experiences of growth. In addition, the literature on psychosocial characteristics and growth is more established, but at the expense of understanding how event characteristics relate to PTG. Furthermore, the extent to which growth relates to PTS, and the very nature and function of PTG itself is unclear. Collectively, these concerns justify the need for further research to understand how people can grow positively from adversity, which in turn, can help inform how practitioners and wider society respond to individuals who experience growth.

CHAPTER THREE: Thesis aims and research questions

3.1. Chapter introduction

The processes by which people perceive positive changes following adverse events has been a focus of emerging literature in the past two decades. Chapter 2 outlined our current understanding and indicated key gaps in existing knowledge relating to PTG. Collectively, these gaps have limited a more comprehensive understanding of process and outcomes related to PTG, which will provide a focus of this thesis. Therefore, the broad aim of this thesis is to advance an understanding of the process and outcomes of PTG among people who experience a diverse range of adverse events. In doing so, it will seek to identify individual differences and event characteristics that may explain why some people report more growth than others. This overall aim will be explored through four empirical studies. The overall research questions that this thesis will address are stated in section 3.2., with more specific questions associated with each empirical chapter provided thereafter. As many aspects of PTG remain unknown, the research questions are deliberately broad to capture as much information as possible to advance the overall aim of the thesis.

3.2. Research questions

1. To what extent do existing PTG theories reflect people's experiences of growth?
2. How do the characteristics of the adverse event relate to PTG?
3. What is the relationship between growth and distress?
4. To what extent is PTG a coping strategy, an outcome of adversity, or both?
5. Does PTG change over time?

3.2.1. Study 1a and Study 1b

As discussed in Chapter 2, there is a paucity of literature on event characteristics and PTG. Literature has tended to focus on subjective interpretations of adverse events, rather than the objective characteristics of the event experienced. Since studies find that

people who experience interpersonal events, multiple types of events and childhood adversity report increased PTSD symptoms compared to those with no such adverse event history, it is possible event characteristics may also relate to PTG in some way. To this end, the following research questions were proposed:

1. Do interpersonal events, multiple types of events and childhood adversity relate to PTG? (Study 1a and Study 1b)
2. Do psychosocial coping and social support factors predict PTG over and above event characteristics? (Study 1a and Study 1b)
3. What psychosocial factors mediate relationships between event characteristics and PTG? (Study 1b)

3.2.2. Study 2

Qualitative studies are needed to capture the complexity and individual differences experienced as part of growth (see Chapter 4, section 4.3.). They have particular strengths in being able to generate new knowledge and hypotheses for future research testing. There are few qualitative investigations of PTG (see Study 2, section 6.1.1.) which would help get beneath the data reported in quantitative studies. Therefore Study 2 seeks to explore the findings of Study 1 in more depth. To this end, the research questions for Study 2 were identified as the following:

1. How do people experience positive and negative changes following adversity?
2. What psychosocial factors promote or inhibit the growth process and outcomes?

3.2.3. Study 3

Building on the qualitative Study 2 in this thesis, Study 3 was concerned with simplifying complex relationships identified in the previous study. Chapter 2 identified mixed findings in respect of relationships between PTS and PTG, while Chapter 7 provides further detail about limits of current knowledge in respect of cognitive factors.

One way to explore this literature gap further was to identify pathways towards PTS and PTG. The following questions were proposed:

1. How do types of rumination, event centrality and control perceptions relate to growth (PTG) and distress (PTS)?
2. Are there different cognitive predictors of growth and distress?

3.2.4. Study 4a and Study 4b

Study 4 argues that there are limited longitudinal mixed-method investigations of PTG (see Chapter 4, section 4.4.). Thus, it still remains relatively unclear how growth changes over time amongst those who experience subsequent adverse events. Study 4 builds on cross-sectional findings reported in prior chapters by exploring whether event characteristics and intrusive thoughts can predict PTG over time. Furthermore, the chapter examines whether there are different trajectories of PTG that emerge over time, and the extent to which these reflect actual or illusory types of change. The following research questions were proposed:

1. What cognitive and psychosocial factors are associated with different longitudinal trajectories of PTG? (Study 4a and Study 4b)
2. Are there subsets of individuals who report different types of PTG over time? (Study 4b)
3. How well can qualitative and quantitative data indicate the types of PTG people experience at a later time point? (Study 4b)

CHAPTER FOUR: Methodological approach for the thesis

4.1. Chapter introduction

Chapter 4 describes the overarching methodological approaches within in this thesis. To fully explore the psychological process involved in PTG, a mixed-method approach was adopted that draws upon the strengths of quantitative and qualitative approaches. This chapter will begin by outlining the epistemological underpinnings and characteristics of the quantitative, qualitative and mixed-method paradigms. The suitability of these methods to address the research questions will also be discussed, although descriptions of specific analyses can be found in the relevant empirical chapters. Next, cross-sectional and longitudinal designs will be discussed in relation to advancing the thesis aims. Finally, ethical considerations pertinent to all studies will be considered.

4.2. Positivism and the quantitative approach

Positivism assumes that knowledge can be gained through direct observation of the world and that all phenomena are indicators of the truth (Riley, Sullivan, & Gibson, 2012). This epistemological approach thus favours a natural science perspective by proposing and testing hypotheses, and is thus aligned with quantitative methods (Breakwell, Smith, & Wright, 2012). Quantitative approaches are thus concerned with numerical data that can be measured objectively and analysed through statistical techniques. This method can therefore reveal *how* much one variable influences another and under *what* circumstances.

4.2.1. Questionnaires

Questionnaires are a popular method of quantitative data collection within the PTG literature (e.g. Cann et al., 2010; Frazier et al., 2009; Tedeschi & Calhoun, 1996; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012). Questionnaires are advantageous due to their ability to capture a potentially large amount of information that can be

adapted to suit many research situations. Through examination of responses, they can permit hypothesis testing in an objective way (Breakwell et al., 2012). On this basis, studies 1, 3 and 4 used questionnaires in order to capture information on many adverse event and psychological variables that may be implicated in the psychological process of PTG with relative ease. This enabled the testing of specific research questions (see Chapter 3, section 3.2.) that could then be supported or rejected based on the findings.

An additional strength of questionnaires is that they allow for reliability and validity testing. Reliability refers to the degree by which the results obtained can be replicated, while validity is the extent to which the measures used are an accurate reflection of what they purport to measure (Breakwell et al., 2012). In studies 1 and 3, large samples were obtained and measures previously tested among samples exposed to adverse events were selected in order to ensure reliable findings. Reliability and validity statistics were also calculated where possible to explore internal consistency for the questionnaires. Furthermore, questionnaire responses are appropriate for situations where standardisation is required (Breakwell et al., 2012). This was particularly useful in studies 1, 3 and 4 to ensure objectivity and allow comparisons with prior findings in the PTG literature.

Finally, data gathered through questionnaires can simplify often complex phenomenon into more meaningful information (Breakwell et al., 2012). Quantitative analysis in Study 1 identified direct and indirect relationships between adverse event characteristics and PTG involving multiple variables that would have been difficult to achieve through qualitative means. Additionally, Study 3 outlined the development of a cognitive model to simplify qualitative interview data obtained in Study 2. In doing so, the study increased understanding of complex PTG processes which could then be subsequently evaluated and compared to the findings of future investigations.

4.3. Interpretivism and the qualitative approach

The interpretivist paradigm assumes that knowledge is gained through an inductive process of exploration, rather than hypothesis testing. People are said to construct reality through their own experiences, which are best represented through qualitative inquiry (Riley et al., 2012). Qualitative approaches are interested in people's perceptions and understanding of the world, and how this shapes attitudes, beliefs and values (Breakwell et al., 2012). Rich data obtained through such methods can therefore explain *how* or *why* certain phenomenon occur.

4.3.1. Semi-structured interviews

Semi-structured interviews are one example of qualitative methods. They are viewed as a suitable way of exploring people's perceptions of complex and occasionally sensitive issues (Barriball & While, 1994). Unlike structured interviews, semi-structured approaches *guide* rather than *dictate* discussions, facilitating rapport-building and allowing participants to generate new ideas independent of the researcher and existing literature (Breakwell et al., 2012). This inherent flexibility was advantageous to the thesis, as the literature review (see Chapter 6, section 6.1.1.) indicated that there were very few qualitative PTG studies, none of which explicitly addressed PTG in survivors of multiple adversity. Both studies 2 and 4b were exploratory investigations and a flexible interview method was thus deemed appropriate in this context, allowing probing of responses for clarification. Furthermore, rich data could be captured through open-ended questions that would provide an in-depth study of PTG perceptions in survivors of multiple adversity.

As with quantitative methods, ensuring reliability and validity of the interview findings was important. This is all the more necessary as qualitative methods have been noted to be very subjective and 'less' scientific compared to quantitative techniques (Breakwell et al., 2012). As data gathered through semi-structured means can be comprehensive and highly detailed, a smaller sample size is usually sufficient to provide valid conclusions. Data should reach saturation (i.e. the point where no new information

can be gathered from recruiting additional participants) to ensure a good level of content validity, such that enough variability is captured among responses to measure a particular phenomenon (Fusch & Ness, 2015). Guest, Bunce and Arwen (2006) recommend a sample of at least 12 people, beyond which point data saturation occurs as no new ideas emerge, enough information is provided to replicate the study, or no further coding is required. Therefore, studies 2 and 4b required at least 12 participants to explore PTG perceptions, and collection would stop once it was felt saturation had taken place (Fusch & Ness, 2015). Reliability was demonstrated by conducting studies 2 and 4b qualitative analyses in line with recognised criteria to improve the trustworthiness of the findings (Creswell, 2014; Guba, 1981; see Study 2, section 6.3.). While subjectivity can never be fully removed from qualitative methods, steps were therefore taken to enhance the rigour of the results.

4.4. Critical realism and mixed-method approaches

Adopting either a quantitative or qualitative approach can be problematic. Positivist-influenced quantitative methods have been criticised for being unable to sufficiently explore the context of people's experiences in any great depth (Breakwell et al., 2012; Denzin & Lincoln, 2011; Riley et al., 2012). For example, participants are unable to elaborate their responses to questionnaires. In addition, the inherent subjectivity of interpretivist-aligned qualitative approaches means the findings cannot be subject to rigorous scientific testing (Breakwell et al., 2012). Given the weaknesses with the above approaches, it was felt that adopting either one of these two perspectives in isolation would be detrimental to the investigation of PTG.

Instead, the thesis required a flexible yet inclusive methodological approach that provided multiple perspectives on the PTG process. A middle ground has been advanced that proposes that there is a real social world that we can attempt to understand, although some knowledge is closer to reality than other knowledge (Bhaskar, 1998). In other words, human knowledge only captures a small part of a wider reality. This position has

become known as *critical realism*, which argues that causation can be understood through the social actions and ideas of people which thus make them a relevant case for scientific study (Bhaskar, 1998). This thesis adopts a critical realist approach that confronts the concerns of positivists by taking steps to establish greater validity and reliability, but also accepts the fallibility of knowledge proposed by interpretivists in that it cannot be easily observed empirically.

Critical realism is a general methodological framework as opposed to being aligned to a specific method (Fletcher, 2017). According to critical realist perspectives, there are three stages to data interpretation. First, a method should be selected that would enable the researcher to examine trends within empirical data, known as *demi-regularities* (Fletcher, 2017), such as thematic analysis in Study 2, or cluster analysis in Study 4b. Critical realist principles (Fletcher, 2017) then state that the themes should then be related back to theoretical concepts to draw inferences about the data, in a process known as *abduction*, which would be achieved within the discussion sections. In this case, all empirical findings in this thesis are related back to the three guiding models in this area (see Chapter 2, section 2.6.). The final step in the critical realist approach, known as *retroduction*, was the creation of a space for the researcher to focus on possible causal mechanisms that facilitate or inhibit a phenomenon (Fletcher, 2017), in this case, PTG, which took place within the discussion sections of this thesis.

Mixed-method research embodies critical realist perspectives by drawing upon the strengths of quantitative and qualitative approaches to provide a more comprehensive and in-depth understanding of phenomenon (Johnson, Onwuegbuzie, & Turner, 2007). Broadly, information from both paradigms is combined to explore areas of convergence and divergence. Mixed-method research is particularly advantageous as it can overcome the inherent weaknesses of using a quantitative or qualitative approach alone (Creswell, 2014). Whilst it can be challenging to interpret findings from multiple sources, mixed-methods are advantageous as they can limit any biases inherent within

the researcher and provide a more rigorous investigation of phenomenon (Johnson et al., 2007).

A mixed-method approach was adopted throughout the thesis. Study 2 was designed to contextualise the numerical findings from Study 1 by revealing why some people report more PTG than others. Large elements of data gathered in Study 2 were then simplified within the quantitative analysis of Study 3 to identify underlying psychological processes that explain variability in PTG outcomes. Furthermore, Study 4b adopted a concurrent triangulation design where quantitative and qualitative data are collected separately but treated equally in order to understand and interpret PTG experiences (Creswell, 2014; see Study 4, section 9.9.3.). An additional benefit of combining the data in this way is that it would address current debates around the constructive or illusory function of PTG (see Chapter 2, section 2.6.2.1.) highlighted in the literature review. Therefore, the key strength of the mixed-method approach in this thesis was the ability to provide a more complete understanding of PTG processes beyond that which any single paradigm would offer.

4.5. Online and paper-based data collection methods

Traditional methods of quantitative data collection have primarily relied on paper-based methods, such as questionnaires. Paper-based methods are argued to lead to higher response rates compared to online methods, primarily through face-to-face engagement with participants (Nulty, 2008). However, data collection in this manner is particularly susceptible to socially desirable responding, whereas participants usually complete online surveys in private, thus reducing the potential for bias (Dodou & De Winter, 2014). Furthermore, administering and collecting paper questionnaires can be resource-intensive and time-consuming, which means they may not always be an ideal solution for obtaining larger samples.

The versatility of questionnaires means they can be easily administered online as well as in-person. In recent years, the use of online survey methods has proliferated

psychological research. Studies now adopting web-based data collection are popular within the PTG literature (e.g. Groleau, Calhoun, Cann, & Tedeschi, 2013; Lancaster, Klein, Nadia, Szabo, & Mogerman, 2015; Owens, 2016; Peterson, Park, Pole, D'Andrea, & Seligman, 2008). The rise of online technologies provides convenience and relative anonymity in responding, which is favoured by participants (Touvier et al., 2010). It is argued that responses to web-based questionnaires are comparable to those responding via traditional paper methods in terms of age, gender and education (Smith, Smith, Gray, & Ryan, 2007), and also demonstrate similar reliability (Weigold, Weigold, & Russell, 2013). Online methods are not adversely impacted by non-responders or non-serious responders, enabling a diverse range of people to participate (Gosling, Vazire, Srivastava, & John, 2004). Additionally, the flexibility of online methods mean that data can be collected from a potentially wider participant pool with ease, and errors quickly amended within online survey software (Weigold et al., 2013). Online methods thus appear to be a viable way to collect data.

However, concerns have been raised in relation to the reliability and response rates of online methods. Participants may quickly skim through the online survey and miss out items, for example. Yet, it is argued that responses to web-based questionnaires are comparable to those responding via traditional paper methods in terms of age, gender and education (Smith et al., 2007), with reviews suggesting both methods demonstrate similar reliability (Van Gelder, Bretveld, & Roeleveld, 2010). During the studies, steps were taken to ensure that the same person did not complete any of the same online survey twice; the survey software (SurveyMonkey) provides an option to restrict participation to one specific IP address per online session. While participants could return to an incomplete questionnaire to complete the study, the same individual could not repeat and provide data for a particular study twice. In line with the flexible approach to this thesis, and recommendations (Nulty, 2008), it was decided to make both online and offline paper methods available to participants in studies 1, 3 and 4, to open up data collection to a wider pool of participants. This will balance concerns

in relation to response rates, convenience of completion, and minimising sources of bias insofar as possible.

4.6. Cross-sectional and longitudinal designs

Chapter 2 indicates that a cross-sectional design is popular among many PTG studies (e.g. Morris & Shakespeare-Finch, 2011; Taku, Tedeschi, & Cann, 2015; Tedeschi & Calhoun, 1996). This popularity arises as a result of the relative ease of conducting cross-sectional studies and the ability to measure many variables at a given time (Breakwell et al., 2012). This design was useful in Study 1 for capturing relationships between adverse event, coping variables and PTG. In Study 3, the cross-sectional design enabled the measurement of multiple cognitive factors on PTG and PTS outcomes previously untested in a single model.

Compared to cross-sectional studies, fewer longitudinal investigations of PTG have taken place. While cross-sectional studies are informative, they only provide a snapshot of behaviour at one time point (Breakwell et al., 2012). It is acknowledged that growth emerges and can change over time (Tedeschi & Calhoun, 2004), and so Study 4 used a longitudinal design to identify factors associated with temporal changes in the nature of PTG. Prospective designs are a recognised need in PTG research (Jayawickreme & Blackie, 2014) to understand the role of dynamic adverse event, cognitive and coping factors on growth, which in turn can contribute to knowledge of longer-term changes in PTG. Therefore, the thesis combined the strength of cross-sectional and longitudinal designs to capture as many variables as possible, and in sufficient depth.

4.7. Sampling strategy

To advance the thesis aims and research questions, a diverse sample was needed. Existing PTG research tends to focus on people's reactions to a particular type of event, such as studies of cancer survivors (e.g. Danhauer et al., 2015) or military conflict (e.g. Palmer, Murphy, & Spencer-Harper, 2017). Such an approach does not take

into account the multiple and wide-ranging adverse events that some people can experience in their lifetime (Seery et al., 2010). In addition, participants may not view the particular adverse event under study as their most severe relative to their other experiences, and so greater flexibility is needed in terms of the range of events studied. Few PTG studies incorporate a diverse range of adverse events in their samples (e.g. Frazier et al., 2009; Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012), yet including a wide spectrum of adverse events would provide participants with greater flexibility to nominate their most severe event from their previous experiences. This would complement the aims of the thesis by allowing a diverse range of perspectives to be captured.

Sampling methods can be categorised into *probabilistic* and *non-probabilistic* methods. Study samples derived through probabilistic methods have an equal chance of being selected, whereas non-probabilistic samples involve some intervention from the researcher to obtain a sample suitable for the purposes of the study (Saunders, Lewis, & Thornhill, 2016). The research contained in this thesis required people with at least one adverse event to volunteer their participation, and thus used a non-probabilistic sampling strategy. It was theoretically necessary to restrict participation to people with at least one adverse experience because PTG is argued to occur following the emotional struggle with an adverse event (Tedeschi & Calhoun, 2004). In addition, non-probabilistic self-selection or volunteer sampling is particularly advantageous by reducing the time needed to recruit a suitable sample, and can consist of individuals who are strongly motivated to participate (Paulhus & Vazire, 2007). As the thesis includes a longitudinal element in Study 4, having a motivated sample would be beneficial in terms of reducing any potential attrition that can inevitably affect such designs. Although self-selecting individuals may not be fully representative of the wider population who experience adversity, they can provide deeper insight into a specific phenomenon (Saunders et al., 2016). In this regard, non-probabilistic methods are well-suited to the exploratory studies contained in this thesis to test possible hypotheses.

The intention was to include a wide range of adverse experiences, which required sampling from different sources. To this end, the researcher made contact with several online forums which discussed issues relating to PTS. Contact was also made with voluntary organisations who provided advice or support to those who experienced adverse events, such as intimate partner violence, sexual abuse and military conflict. This may mean that the overall sample could consist of help-seeking individuals who may not represent all survivors of adverse events. However, sampling also took place outside of these environments on university campuses, professional websites and snowballing methods to capture a broader representation of participants. However, the limitations of sampling in this heterogeneous manner means it can be difficult to determine the representativeness of the overall sample, and it may equally lose sensitivity to detect differences among groups of individuals. However, sampling from multiple locations and websites in this manner is a recognised and feasible method for obtaining a sample who meet the study criterion of having experienced at least one adverse event (Buchanan, 2000), to ensure a range of events are represented, and to reduce self-selection bias which may occur by sampling from one source alone (Reips, 2000). Furthermore, individual differences are found even within homogenous samples, which can underestimate hidden populations (Saunders et al., 2016) and minimise the very variability of experiences which was to be captured by this thesis. Therefore, the decision to use a sample of people exposed to at least one adverse event was advantageous in that it reflects findings that as many as 90% of people experience multiple and wide-ranging adverse experiences across the lifespan (Kilpatrick et al., 2013; Seery et al., 2010).

4.8. Ethical considerations

Given the sensitive topic of the thesis, it might be expected that involvement could be highly distressing for participants. However, it is increasingly recognised that participation in studies on adverse events can be a potentially beneficial experience for individuals. A recent meta-analysis of 70 unique samples (Jaffe, DiLillo, Hoffman,

Haikalis, & Dykstra, 2015) concluded that while adversity research can lead to immediate and low-level distress in some individuals, the vast majority of participants report their experiences to be positive. With the aforementioned in mind, steps were taken to ensure the anonymity and welfare of the 468 unique individuals[8] who participated in the current research. All studies in this thesis received ethical approval from the PSYSOC ethics committee in three phases. Research in the thesis adhered to strict ethical guidelines outlined by the British Psychological Society (2009), which are outlined below.

As previously mentioned, some participants were recruited from online forums where permission was granted to post the study. Postings were only made on appropriate forums where members of those forums could reasonably expect to discuss potentially distressing matters. Participants were able to read information provided about each study online prior to giving informed consent. Providing informed consent was a requirement of all participants both online and in-person before they could proceed to the questionnaires. The information was verbally summarised for participants who completed paper copies of the questionnaires, and those who attended interviews in Study 2. The nature of the participant's involvement in each study was clearly explained on the first page of the questionnaire or web page, with contact details of the research team provided at the beginning and end of each study should any questions arise at any point during the research. Information sheets outlined that participation was entirely voluntary and independent of their employment or any support that they may be currently receiving. A progress bar was provided on the online survey software so that participants could monitor any remaining questions to complete. Participants were able to terminate questionnaires or interviews at any point without giving a reason, and without any penalty. In addition, they were given up to a week from the completion of the questionnaires or responses to contact the researcher to withdraw their data. If a

[8] This refers to people who participated in at least one study throughout this thesis.

participant did withdraw, their data would be destroyed and not used in any analysis presented in this thesis.

Participants in the research were reassured that they would remain anonymous and their identity not revealed at any point. Information provided prior to each study explained that the findings may be written up for publication, but that any identifiable information would be removed. However, limits to confidentiality were explained should the person disclose any attempts to harm themselves or others. All data was stored on password-protected electronic files and will be kept for a maximum period of five years, in accordance with British Psychological Society (BPS) guidelines (British Psychological Society, 2009) and the university research policy. In addition, the online survey software used (SurveyMonkey) has procedures in place to ensure the confidentiality of the data obtained. This includes password access to the edit the survey and view the data, as well as hosting the surveys on a secure server.

The nature of the research meant it was important that the wellbeing of participants was ensured at all times. Debrief information directed participants to the contact details of relevant support services should they have concerns about their well-being. In an interview situation, the researcher would pause the discussion should the participant become distressed, at which point it would be the person's decision to continue or end their participation prematurely. As the researcher had relevant clinical experience, they were in a suitable position to provide immediate emotional support should it be required.

4.9. Chapter summary

This chapter argued for a mixed-method approach that embraces the strengths of quantitative and qualitative analysis, to further understand PTG processes and outcomes, and thus contribute unique knowledge in this area of research. Additionally, the decision to use cross-sectional and longitudinal designs augmented the findings in respect of identifying immediate and temporal factors that influence variability in PTG. It

was felt that such an approach would comprehensively address research questions in greater depth compared to prior studies that have adopted single methodological paradigms. The methodological approach of this thesis was therefore rigorous, flexible, and organic in responding to existing theories and data emerging within the empirical studies to comprehend the nature of PTG.

CHAPTER FIVE: Study 1 – Adverse event characteristics and posttraumatic growth

5.1. Chapter introduction

Chapter 2 indicated that there were limited studies that explored relationships between adverse event characteristics and PTG. Study 1 is comprised of two studies (Study 1a and Study 1b) which examined the extent to which event characteristics can influence growth. In line with the research questions outlined in Chapter 3, Study 1a explored whether event characteristics were directly related to PTG over and above psychosocial factors. Next, Study 1b sought to extend the findings of Study 1a by identifying which psychosocial factors indirectly mediate relationships between event characteristics and PTG.

Study 1a: Posttraumatic growth in students, crime survivors and trauma workers[9]

5.2. Variable selection

Chapter 2 revealed gaps in our understanding of the factors responsible for promoting PTG. Specifically, it noted (in section 2.7.3.) that psychosocial characteristics had received more empirical attention in comparison the objective characteristics of the adverse event; namely, how the type of event, frequency of exposure to different types of event, and the developmental timing of the event relate to growth. These variables will, therefore, be explored alongside more established psychosocial predictors of growth to ascertain the extent to which event characteristics influence PTG in three samples who experience different types of adverse events.

As per the aforementioned rationale in Chapter 2 (section 2.7.3.), three event characteristics relatively unexplored in the PTG literature (interpersonal event, number of event types, age at serious event) were included to determine whether they do account for self-reported growth. Presently, findings indicate that they can at least partly explain negative outcomes within the PTS literature (Ehring & Quack, 2010; Hagenaars et al., 2011; Ogle et al., 2013). Spirituality, active coping and social support have consistently demonstrated robust positive associations with PTG (Prati & Pietrantoni, 2009; see Chapter 2, section 2.7.1.) and so these variables were included in the analysis. In addition, PTS symptoms are implicated as an important catalyst for PTG development (Joseph et al., 2012; Tedeschi & Calhoun, 2004; see Chapter 2, section 2.7.2.), although the way in which they relate to growth is still unclear, and so this variable was also assessed alongside the six other predictors.

[9] This study was published: Brooks, M., Lowe, M., Graham-Kevan, N., & Robinson, S. (2016). Posttraumatic growth in students, crime survivors and trauma workers exposed to adversity. *Personality and Individual Differences, 98,* 199-207.

5.3. Posttraumatic growth in different samples exposed to adversity

The PTG literature reviewed in Chapter 2 has considered growth from adversity in a wide range of samples. However, existing research tends to use homogenous samples of people exposed to a specific type of adversity, which ignores the potential unmeasured range of adverse events that people may experience in their lifetime (see Chapter 4, section 4.7.). Therefore, the study drew upon three samples in order to represent the range of experiences that the wider population may face. First, students could be argued to represent a population where a wide range of adverse events are experienced. Second, a sample of violent crime survivors is used to represent a population who experience more frequent and interpersonal forms of adversity. Third, a sample of people who work with individuals who have experienced adverse events (hereafter termed '*trauma workers*') may not only be exposed to adverse events through their clients, but also have their own personal history of adversity. The rationale for each sample is provided below.

5.3.1. Students

One sample where a range of adversarial events could be considered is university students. Students form samples in many existing PTG studies (e.g. DeRoma et al., 2003; O'Connor, Cobb, & O'Connor, 2003; Prati & Pietrantoni, 2009) and are a generally accessible population who have been potentially exposed to a range of adverse events rather than one specific stressor. Indeed, studies show that rates of adverse event exposure in students are similar to those of the general population (Frazier et al., 2009; Smyth, Hockemeyer, Heron, Wonderlich, & Pennebaker, 2008). Thus, using students is advantageous to the study of PTG experiences as it allows for comparison to other samples.

Furthermore, it could be argued that university students represent high functioning individuals who, despite previous adversity, are seemingly able to lead lives relatively free of the impairments that adversity can generate (Taku et al., 2007). For

example, they are able to study academically at a high level. These may reflect a proportion of the population exposed to adverse events who exhibit resiliency traits prior to the event, or even growth after the event that buffers against pathology such as PTSD (Bensimon, 2012). As such, university students could be construed as a high functioning population who provide a representative sample of people potentially exposed to a range of interpersonal and non-interpersonal adverse events in order to explore factors related to PTG.

5.3.2. Survivors of violent crime

In contrast to student samples, survivors of violent crime may represent a population who experience more frequent adversity, often of a deliberate nature and at a younger age. Some survivors of serious criminal acts are subject to a disproportionate number of interpersonal events in comparison to the non-traumatised population (Kunst, Winkel, & Bogaerts, 2010b; Tedeschi, 1999). In particular, survivors of intimate partner violence (IPV) and sexual assault are likely to experience sequential acts of victimisation in the context of interpersonal relationships (Felson, Ackerman, & Gallagher, 2005). Collectively, exposure to interpersonal and multiple events places people at great vulnerability to substance dependency, depression and elevated PTS symptoms (Ruback, Clark, & Warner, 2014; Scarpa, Haden, & Hurley, 2006), compared to individuals who experience adversity resulting from natural causes (Santiago et al., 2013). Furthermore, research has documented histories of adverse events at a young age in those who are harmed by crime in adulthood (Andrews, Brewin, Rose, & Kirk, 2000). In one longitudinal study lasting over 20 years, adulthood sexual assault and physical assault victimisation was more likely to occur among individuals with a history of physical and sexual abuse and neglect in childhood (McIntyre & Widom, 2011). Thus, people who may be vulnerable to criminal victimisation in adulthood are likely to have experienced multiple interpersonal events at a young age.

The aforementioned difficulties impair every day occupational and social functioning to a great degree in violent crime survivors, where chronic adversity can negatively influence perceptions of available support and thus magnify distress (Hanson, Sawyer, Begle, & Hubel, 2010). Furthermore, existing PTG models fail to explain how factors associated with growth (see Chapter 2, section 2.7.) differ in those with chronic and multiple exposures to adverse events. Existing research has explored PTG among samples with physical assault as the index adverse event (Kleim & Ehlers, 2009), however, such studies have not taken into account the diverse range of experiences that survivors of crime often face. Experiences of multiple and deliberately perpetrated events could lead to differences in the processing of adverse events and the factors that contribute towards crime survivor's experiences of PTG.

5.3.3. Trauma workers

The study of PTG also has particular relevance to trauma workers. Trauma workers represent another proportion of the population who routinely are exposed to an elevated degree of adverse events (Cohen & Collens, 2013). However, unlike survivors of violent crime, negative and positive changes can occur in trauma workers indirectly through the narratives of their clients who are exposed to serious adversity (Cohen & Collens, 2013). While there are currently no explanatory models of vicarious or secondary PTG, recent studies have increasingly drawn attention to PTG emerging in this manner (Brockhouse et al., 2011; Samios, Rodzik, & Abel, 2012). In comparison, there is a paucity of research in relation to trauma worker's own *direct* experiences of adversity. This is surprising, as empathic and altruistic tendencies observed in trauma workers and similar professions are thought to stem from the experience of adversity in their own personal lives (Staub & Vollhardt, 2008; Tedeschi & Calhoun, 2004).

The FDM argues that the emotional salience and proximity to personal adverse events can trigger cognitive processing necessary for PTG, more so than adversity experienced in occupational contexts (Tedeschi & Calhoun, 2004). Thus, there is a need

to explore the factors relevant to PTG based on trauma workers' own personal adverse history. Yet, despite multiple exposures to a range of adverse events at work and their own personal history of adversity, it could be argued that trauma workers are relatively high functioning group who are able to sustain employment within emotionally demanding professions. Indeed, research shows that trauma workers can draw upon a range of coping mechanisms to manage distress (Cohen & Collens, 2013). This may reflect trait resiliency or the buffering nature of PTG which allows trauma workers to reinterpret multiple adversity in a less threatening way (Bensimon, 2012; Samios et al., 2012), although few studies have explored this assumption. Therefore, the current research will focus on personal adversity and predictors of PTG in a high functioning sample of trauma workers with multiple exposures to indirect adversity.

5.4. Aims of study

Based on the existing literature (Hagenaars et al., 2011; Kira et al., 2013; Kılıç et al., 2016; Ogle et al., 2013; Prati & Pietrantoni, 2009), Study 1a explored the contributions of event characteristics (interpersonal events, frequency of adversity types, the age at which the most serious event occurred) and psychosocial factors (spirituality, active coping, PTS symptoms and social support) as potential predictors of PTG. These predictors would be explored in three samples who represent survivors exposed to different types or frequencies of adversity using a multi-study design. The student study[10] explored the role of event characteristics and psychosocial factors among university students. The student sample represents individuals with experience of a broad range of adversity types yet are able to study academically at a high level. The crime survivor study[10] applied the same predictors to a sample of survivors of violent crime, who may experience frequent interpersonal events that can negatively impact upon psychological functioning. Finally, the trauma worker study[10] extended the findings of the student and

[10] The published paper refers to Study 1, 2 and 3. To avoid confusion with other studies in this thesis, the multi-studies are instead referred to as the "student study", "crime survivor study" and "trauma worker study", respectively.

crime survivor studies by exploring event characteristics and psychosocial predictors of PTG among trauma workers. These are individuals who experience events indirectly in their line of work, as well as their own personal adversity, yet are relatively able to continue in demanding occupational roles. Taken together, this approach would allow the identification of individual differences and similarities in the development of PTG across a diverse range of samples that would not otherwise be revealed in single study designs.

Student study

In the student study, it was expected that spirituality, active coping, and social support would positively predict growth. As studies have identified relationships between event characteristics and PTS symptoms, it was also expected that interpersonal events, frequency of adversity types and the age at which the serious event occurred would be related to PTG. No directional hypotheses were presented in respect of event characteristics and PTS symptoms due to an absence of research, or inconsistent findings in prior literature, respectively.

5.5. Method

5.5.1. Participants and procedure

In accordance with the aims of the thesis to obtain a diverse sample exposed to a range of adverse events, participants were recruited via university posters on a northwest university campus (see Appendix I), and online postings on message boards and student forums (see Chapter 4, section 4.7.). One hundred and one students (83.2% female) with at least one prior adverse event took part in the study. Table 2 presents demographic information for the student sample (and for the crime survivor and trauma worker studies). To assess whether any demographic variables should be retained for the analysis, each was entered simultaneously into a multiple regression model with PTG as the dependent variable (see section 5.5.3. for multiple regression procedures).

However, none were significantly related to PTG (all $p \geq .211$) and were thus excluded from further analyses.

Online questionnaires were available through a link provided on the websites where the potential participants could access information about the study and their rights as participants. Paper copies were also available to those who requested pen and paper completion.[11] Paper questionnaires could be returned anonymously to a secure lockable deposit box on the university campus by post or in person. Upon providing informed consent, participants completed the questionnaires. They were asked to nominate one adverse event of their choice and respond to all questionnaires with that event in mind, noting their symptoms within the past two weeks.[12] At the end of the study, participants received debrief information, which included details of relevant support services. They had the option to enter a prize draw for a £50 shopping voucher as compensation for their time. The study was approved by the university ethics committee (see Appendix II) and adhered to British Psychological Society (2009) ethical guidelines.

[11] Overall, 14.9% of participants (11.9% students, 18.3% crime survivors, 15.6% trauma workers) opted for paper completion of the questionnaires. There were no differences observed between those who completed the measures online or on paper.

[12] This timeframe was chosen for several reasons. First, the purpose was to assess current functioning, rather than pre- and post-event functioning had a longer timeframe been used. Second, this timeframe is consistent with existing literature (e.g. Blake, Weathers, Nagy, & Kaloupek, 1995; Kleim, Ehlers, & Glucksman, 2012) and therefore allows for comparison of results across studies.

Table 2. *Sample descriptive characteristics for the student, crime survivor and trauma worker studies*.

	Students (*N* = 101)			Crime survivors (*N* = 71)			Trauma workers (*N* = 96)		
Characteristic	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Age (years)	26.96	9.96	17 – 58	40.85	11.95	19 – 67	35.86	11.16	21 – 69
Years since serious event	8.29	8.15	0 – 34	22.48	14.00	0 – 55	12.06	12.17	0 – 58
		N	%		*N*	%		*N*	%
Marital status									
Single		46	45.5		20	28.2		20	28.2
Dating/Cohabiting/Married		49	48.5		36	50.7		47	49.0
Divorced/Separated		6	5.9		15	21.1		8	8.5
Heterosexual orientation		82	81.2		57	80.3		89	92.7
White ethnicity		77	77.8		61	85.9		84	87.5
Religious		51	50.5		50	70.4		60	62.5
Event type									
Accident		46	45.5		33	46.5		51	53.1
Natural disaster		6	5.9		8	11.3		12	12.5
Serious attack/threat[1]		41	40.6		54	76.1		44	45.8
Sexual assault/rape/CSA[1,2]		31	30.7		52	73.2		35	36.5
Military conflict[1]		5	5.0		6	8.5		4	4.2
Serious illness		30	29.7		15	21.1		27	28.1
Bereavement		54	53.5		33	46.5		53	55.2
Neglect[1]		27	26.7		33	46.5		26	27.1
Other event		19	18.8		14	19.7		17	17.7

Note. Consistent with prior literature (e.g. Martin et al., 2013; Mauritz et al., 2013), interpersonal events were defined as acts where there was a deliberate intention by one person to cause harm towards another, or harm caused by one person towards another, specifically, physical or sexual violence or threats, and military conflict. [2] CSA = child sexual abuse.

5.5.2. Measures

Adverse event history. The 12-item checklist from the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997) is a self-report measure of adverse experiences. The checklist includes 12 types of adverse events, including accidents and sexual assaults. The participant records the frequency of each event to the best of their memory. The measure has been validated in samples of individuals exposed to a range of adversarial events, including accidents, assaults and military conflict (Foa et al., 1997). In all empirical studies within this thesis, the PDS checklist was adapted from Foa et al.'s (1997) original version to include two further items relating to parental neglect and adversity experienced in work settings, which account for other potentially adverse events (Cohen & Collens, 2013; Hagenaars, Fisch, & van Minnen, 2011). The more events recorded by participants reflects the higher the amount of adverse events experienced. A further addition to the questionnaire invited participants to record the age their most serious event first occurred.

Spirituality. The Beliefs and Values Scale (BVS; King et al., 2006) is measure of religious and spiritual beliefs, where respondents are asked to indicate their agreement to 20 statements using a scale from 0 (strongly disagree) to 4 (strongly agree). It has been validated as a reliable measure in large and diverse samples (King et al., 2006). Example items include, 'Although I cannot always understand, I believe everything happens for a reason' and 'I believe in a personal God'. An overall score is produced, with higher scores indicative of greater spirituality. In the current study, internal consistency was high (α = .96).

Coping styles. The Brief COPE (Carver, 1997) is a 28-item questionnaire assessing 14 coping styles on a four-point scale from 0 (I haven't been doing this at all) to 3 (I've been doing this a lot). Coping styles measured include active coping, distraction and venting. Participants rate coping styles upon which they rely in potentially stressful situations; example items include, 'I've been taking action to make the situation better'

and ‘I’ve been refusing to believe it has happened’, with higher scores representing greater use of the specific coping style. The Brief COPE has demonstrated good internal reliability and can be used as a short measure for coping in specific situations of interest (Carver, 1997). As with previous studies (Thornton & Perez, 2006), the active coping scale was of particular interest due to its links with new perspectives in PTG development (Tedeschi & Calhoun, 2004). Reliability for the active coping scale was good (α = .78).

Posttraumatic stress. The PTSD-8 (Hansen et al., 2010)[13] is a brief measure of PTS symptoms, where respondents rate their agreement with eight statements on a four-point scale from 0 (not at all) to 3 (most of the time). The three subscales of avoidance, intrusion and hyperarousal are represented with items such as ‘Recurrent thoughts or memories of the event’ and ‘Avoiding activities that remind you of the event’. Participants with a score of three or above on each subscale may display PTS traits. The PTSD-8 has been validated in samples of rape survivors, whiplash patients and survivors of natural disasters (Hansen et al., 2010). The overall scale was used in this study, which displayed good internal consistency (α = .88).

Social support. The Two-Way Social Support Scale (2-Way SSS; Shakespeare-Finch & Obst, 2011) is a 21-item measure of social support on a scale from 0 (not at all) to 5 (always). Example items include, ‘There is someone in my life I can get emotional support from’ and ‘There is someone who will help me fulfil my responsibilities when I am unable’. Higher scores endorse greater perceived support. The scale has been validated in two community samples (Shakespeare-Finch & Obst, 2011). The overall score for the measure was used in this study, demonstrating high reliability (α = .93).

Posttraumatic growth. The Posttraumatic Growth Inventory – Short Form (PTGI-SF; Cann et al., 2010) is a measure of positive growth, on a six-point scale from 0 (no change) to 5 (very great change). Participants are asked to rate what extent they

[13] This measure is based on the DSM-IV definition of PTSD. However, studies have indicated that the underlying clusters of symptoms and prevalence rates are broadly similar across the DSM-IV and DSM-V (Kilpatrick et al., 2013).

have changed since their stressful life event with 10 items such as, 'I changed my priorities about what is important in life' and 'I discovered that I'm stronger than I thought I was'. The PTGI-SF has been validated for use in samples including survivors of IPV, bereaved persons and those with complex health needs. It demonstrates similar reliability to that of the original 21-item version of the PTGI, whilst having the advantage of brevity (Cann et al., 2010). A total score is obtained, with higher scores reflecting greater perceived change. The PTGI-SF demonstrated high internal consistency in the current study (α = .89).

Demographic information (age, gender, ethnicity, sexuality, religion and disability) was also collected to obtain sample characteristics. Copies of the materials given to participants are provided in Appendix III.

5.5.3. Data analysis

Data analysis took place in three phases. First, data screening took place to assess the prevalence of missing data and deviations from normality, according to established procedures (Tabachnick & Fidell, 2013). Second, bivariate Pearson's correlations were conducted to explore the direction and magnitude of relationships between interpersonal trauma, number of event types, active coping, PTS symptoms and social support. The strength of relationships is measured using the Pearson's *r* coefficient, which can range from -1 to +1; *r* coefficients between .10 and .29 represent a small effect, .30 and .49 a medium effect, and *r* values exceeding .50 indicate a large effect (Field, 2013). Correlations are recommended before multiple regression analyses in order to identify the presence of highly correlated ($r \geq .80$) items which may indicate multicollinearity and thus complicate subsequent analysis (Tabachnick & Fidell, 2013).

Third, multiple regression analyses were conducted to assess the extent to which the key study variables predicted PTG whilst controlling for the effects of one another (Tabachnick & Fidell, 2013). Both correlation and multiple regression assume linear relationships between independent and dependent variables (Field, 2013). Therefore,

linearity tests were undertaken, with deviation values greater than $p > .05$ confirming linear relationships. Predictors were entered into the regression model simultaneously using the forced entry method. This method is appropriate for exploration among a small number of variables where it is unclear which variables exert most effect on the dependent (criterion) variable (Tabachnick & Fidell, 2013).

The variance in the dependent variable explained by the predictors can be determined using the Adjusted R^2 (Adj. R^2), which also accounts for sample size unlike R^2 values alone (Field, 2013). Typically, Adj. R^2 values between .02 and .12 imply small variance explained, values between .13 and .25 indicate medium variance, and values above .26 reflect a large proportion of the variance accounted for by predictors in the regression model (Cohen, 1988). In addition to the correlation analyses already described, multicollinearity was assessed using reciprocally-related Variance Inflation Factor (VIF) and Tolerance indices. VIF values close to or exceeding 10 and Tolerance values close to 0 indicate problems with multicollinearity (Field, 2013). As with Chapter 2, section 2.7.2., Cohen's f^2 was calculated using online software (Soper, 2016b) as an additional measure of effect size for multiple regression analyses, which provides small (≤ .14), medium (.15 to .34) and large (≥ .35) effect sizes, respectively (Cohen, 1988).

Prior to the statistical testing, power analysis was undertaken to determine the appropriate sample size needed to find a significant result and reduce type II (false negative) errors (Cohen, 1988). *A priori* power analyses conducted using G*Power software (version 3.1; Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a minimum sample of 55 participants would be needed to detect significant medium effects ($R^2 \geq .30$; $p < .05$) using multiple regression with 80% power (Cohen, 1988).[14] Furthermore, in

[14] Power analyses are widely conducted *a priori* using 80% power, which is considered appropriate (Faul et al., 2007). Thus, there is an 80% chance of rejecting a false hypothesis, thus reducing type II errors. A medium effect was selected as prior reviews (Prati & Pietrantoni, 2009) have found medium effects for psychosocial factors on PTG, and medium effects can also be visible to the naked eye of 'careful' observers (Cohen, 1988, p. 156).

the case of one-tailed directional hypotheses, the adjusted alpha values are reported (i.e. halving the *p* value; Field, 2013).

5.6. Results

5.6.1. Data screening

Data screening procedures were undertaken to determine the suitability of the data for parametric analysis. No erroneous or invalid entries were identified across the entire data set. Missing values analysis (Little, 1988) indicated that the data were missing completely at random, [χ^2 (172) = 435.63, p = .415]. Missing values comprised no more than 1% of the data on the variables of interest, and were observed on the social support (N = 2) scale. Missing values were replaced using Expectation-Maximisation techniques due to their relatively simplicity to implement, and their appropriateness for situations with less than 5% missing data (Tabachnick & Fidell, 2013).

The seven variables of interest were explored for deviations from normality. Shapiro-Wilk tests were selected due to their relative power compared to the Kolmogorov-Smirnov test, although both are sensitive to sample size (Tabachnick & Fidell, 2013). Therefore, inspection of box-plots, histograms, Q-Q plots also took place, according to established recommendations (Field, 2013; Kline, 2016; Tabachnick & Fidell, 2013). In addition, Z scores were calculated to establish how many standard deviations (*SD*) the skewness and kurtosis values departed from the mean. Cut-off values to determine non-normality vary, with some authors suggesting above ±1.96 for skewness and kurtosis (Tabachnick & Fidell, 2013), and others arguing for more liberal cut-offs above ±3 for skewness and above ±10 for kurtosis (Kline, 2016).

All variables apart from PTG (p = .191) were found to be non-normal, indicated by significant Shapiro-Wilk tests. Box-plots detected six outliers at the upper end of the number of event types variable and three outliers on the upper end of the age at serious event variable. Upon further inspection, skewness Z scores for most variables, except for the number of event types (Z = 4.18) and age at serious event (Z = 3.49), were under

3 standard deviations from the mean. All kurtosis *Z* values fell below ±10. Data transformations were considered,[15] but not applied as this could alter the original hypothesis under examination, and parametric methods are robust against deviations from normality (Grayson, 2004). It was also felt these findings were to be expected given the nature and context of the study, and the frequency of adverse events reported in the sample. Finally, linearity tests were conducted to establish whether the key variables were linearly-related to PTG, thus meeting the assumption of linearity for regression analyses (Tabachnick & Fidell, 2013). Linear associations were confirmed as linearity test results for all variables had values above $p < .05$. In addition, there were no significant deviations from linearity (all $p > .05$), further indicating that the relationships were linear in nature (Field, 2013).

5.6.2. Preliminary analyses

The prevalence of exposure to adverse events for participants is presented in Table 2. Of the student sample, 83.2% experienced more than one adverse event type, with 68.3% experiencing two to five event types and 15% experiencing six to ten separate event types. In addition, 30.7% of students reported bereavement as the most serious event experienced among the range of adversity types. Approximately three-fifths of the sample (59.4%) had experienced interpersonal events, such as physical or sexual abuse, while a similar proportion (56.4%) reported childhood adversity below the age of 18. The prevalence of people who reported PTG in the sample was 97.0%; this was calculated by totalling the number of participants who scored at least 1 (*very small change*) or more on the PTGI-SF measure. Therefore, 3.0% of the sample indicated that they had not experienced PTG.

Means and standard deviations for the psychosocial measures are presented in Table 3. Pearson correlations (reported in Table 4) revealed that age at serious event, spirituality, active coping, PTS symptoms and social support were all positively

[15] Square root and logarithmic transformations were applied, but normality did not improve significantly and so this justified retaining the original data (Tabachnick & Fidell, 2013).

associated with PTG. Interpersonal events and number of event types were unrelated to growth.

Multiple regression analysis was conducted to assess the contributions of the seven predictors towards PTG in the student sample. Using the simultaneous method, a significant model emerged [F (7, 93) = 10.27, $p < .001$; Adj. $R^2 = .39$, $f^2 = .64$], in which age at serious event ($p = .023$), spirituality ($p = .008$), active coping ($p = .002$), PTS symptoms ($p = .010$) and social support ($p = .048$) emerged as significant positive predictors of PTG. Interpersonal events and number of event types did not predict PTG. The results of the multiple regression are presented in Table 5.

Table 3. *Means and standard deviations for key student, crime survivor and trauma worker study variables.*

	Students (*N* = 101)			Crime survivors (*N* = 71)			Trauma workers (*N* = 96)		
	M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Number of event types	3.36	2.13	1 – 10	5.19	2.79	1 – 14	3.86	2.32	1 - 12
Age at serious event (years)	18.65	9.42	2 - 52	18.36	14.01	1 - 56	23.42	12.32	0 - 56
Spirituality	32.98	21.22	0 - 76	43.83	21.27	0 – 78	38.68	20.25	3 – 79
Active coping	3.67	1.73	0 - 6	4.28	1.49	0 - 6	3.52	1.72	0 - 6
PTS symptoms	12.42	5.89	0 – 23	15.82	6.09	0 - 24	9.54	6.08	0 – 24
Social support	75.18	18.70	30 - 105	70.82	22.37	16 - 105	83.28	16.11	45 - 105
Posttraumatic growth	25.24	12.45	0 – 50	27.69	13.23	0 – 50	23.41	13.48	0 – 50

5.7. Discussion

The student study showed expected relationships between PTG and a number of psychosocial variables among students. Specifically, in support of the hypothesis and prior literature (Gerber et al., 2011; Prati & Pietrantoni, 2009; Shakespeare-Finch & Lurie-Beck, 2014), age at the time of the serious event, spirituality, active coping, PTS symptoms and social support were positively related to PTG. However, active coping methods, spirituality and social support demonstrated stronger relationships with growth compared to the age the serious event occurred. Contrary to the hypothesis, and some literature (Kira et al., 2013), interpersonal events and number of event types were unrelated to growth. Taken together, the results suggest that psychosocial factors are more closely related to adjustment from adversity compared to more objective characteristics of the serious event.

The student study explored predictors of PTG in a high functioning sample exposed to a broad range of adverse events. However, this does not fully account for the experiences of people exposed to particularly frequent and interpersonal adverse events above the general population. One example of a population with more extreme and interpersonal adversity is survivors of violent crime, whose experiences can lead to poor social and occupational functioning (Hanson et al., 2010; Ruback et al., 2014). Therefore, the crime survivor study assessed the efficacy of the predictor variables used in the student study among survivors of violent crime.

Crime survivor study

In the crime survivor study, it was hypothesised that the age the most serious event occurred, spirituality, active coping, PTS symptoms and social support would contribute towards PTG, based on the findings from the student study. Given that survivors of violent crime may experience significant adversity that may serve as a catalyst for growth, it was expected that interpersonal events and the number of event types would be associated with PTG.

5.8. Method

5.8.1. Participants and procedure

Seventy-one survivors of crime (70.4% female) volunteered to take part in this study according to procedures already outlined for the student study (section 5.5.). Table 2 presents demographic information for the sample. As with the student study, no demographic variable was significantly associated with PTG when entered into a simultaneous regression model (all $p \geq .201$), and were therefore not considered further. Participants were recruited using messages advertised on websites provided by three victim services, which support female and male survivors of intimate partner violence, child sexual abuse and sexual assault, respectively. Two participants were also sampled from a concurrent study using survivors of violent crime (Graham-Kevan et al., 2015).

5.8.2. Measures

All measures in this study were the same as those described in the student study. Adverse event history was explored using the PDS (Foa et al., 1997). The BVS (King et al., 2006), PTSD-8 (Hansen et al., 2010), 2-Way SSS (Shakespeare-Finch & Obst, 2011) and PTGI-SF (Cann et al., 2010) measured spiritual belief (α = .96), PTS symptoms (α = .91), social support (α = .95) and PTG (α = .91), each demonstrating high internal reliability. The Brief COPE (Carver, 1997) examined active coping styles with somewhat lower reliability (α = .61).

5.9. Results

5.9.1. Data screening

Missing values analysis (Little, 1988) indicated that the data were missing completely at random, [χ^2 (172) = 61.10, p = .998]. Only a very small proportion (1.7%) of data was missing for the sample, and so missing values were replaced with the Expectation-Maximisation method (Tabachnick & Fidell, 2013), as with the student study. Shapiro-Wilk tests indicated that all variables apart from PTG (p = .136) were non-normal

(all $p < .05$). One outlier was found at the upper end of the number of event types variable, and two at the upper end of the age at serious event variable. *Z* skewness scores for the number of event types ($Z = 3.24$) and age at serious event ($Z = 3.74$) variables were above the ±3 cut-off (Kline, 2016). All other variables had *Z* scores below ±3 for skewness and ±10 for kurtosis and not did present concern. For reasons already outlined in the student study (see section 5.6.1.), the data were not transformed. All variables were linearly-related to PTG.

5.9.2. Preliminary analyses

The prevalence of exposure to adverse events for participants is presented in Table 2. Among the crime survivor sample, 94.4% experienced more than one adverse event type, with 56.4% experiencing two to five event types and 32.4% experiencing six to ten event types. Notably, an overwhelming majority of the sample (94.4%) experienced some form of interpersonal adversity; for instance, around three-quarters of participants experienced sexual abuse (73.2%) and serious physical attacks or threats (76.1%). Nearly a quarter (23.9%) of the sample indicated that sexual abuse was their most serious adverse event. Around two-fifths (42.3%) of crime survivors reported childhood adversity below the age of 18. Most participants (98.6%) reported at least a *very small change* (a score of 1 or more) on the PTGI-SF.

Means and standard deviations for the psychological measures are presented in Table 3. Pearson correlations revealed that age at serious event, spirituality, active coping and social support were all positively associated with reported PTG. PTS symptoms, interpersonal events and number of event types were unrelated to growth.

Table 4. *Correlations between key student, crime survivor and trauma worker study variables*.

	Students (*N* = 101)								Crime survivors (*N* = 71)							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1. Interpersonal event	-								-							
2. Number of event types	.50***	-							.17	-						
3. Age at serious event (years)	-.09	.06	-						-.10	-.19	-					
4. Spirituality	-.03	.01	.19	-					-.03	.02	.33**	-				
5. Active coping	.21*	.23*	.30**	.16	-				.21	-.03	.08	.13	-			
6. PTS symptoms	.27**	.21*	.00	.22*	.12	-			.07	.41***	-.11	.00	.03	-		
7. Social support	-.18	-.04	.17	.21*	.31**	-.07	-		.00	-.23	.13	.24*	.15	-.45***	-	
8. Posttraumatic growth	-.01	.16	.37***	.40***	.46***	.28**	.35***	-	.15	-.16	.25*	.50***	.37***	-.11	.40***	-

	Trauma workers (*N* = 96)							
	1	2	3	4	5	6	7	8
1. Interpersonal event	-							
2. Number of event types	.44***	-						
3. Age at serious event (years)	-.04	.07	-					
4. Spirituality	.09	.16	.20	-				
5. Active coping	-.03	-.14	-.06	.08	-			
6. PTS symptoms	.15	.31**	-.02	.17	.20*	-		
7. Social support	-.02	-.08	-.05	.20*	.17	-.10	-	
8. Posttraumatic growth	-.08	.10	.17	.37***	.35**	.27**	.32**	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Interpersonal event was dummy coded; 0 = no interpersonal event; 1 = no interpersonal event.

Multiple regression analysis assessed the seven variables as potential predictors towards PTG in the sample. Using the simultaneous method, a significant model emerged, [F (7, 63) = 7.12, p < .001; Adj. R^2 = .38, f^2 = .61]. Table 5 presents the results of the regression in which spirituality (p < .001), active coping (p = .018) and social support (p = .026) emerged as significant positive predictors. There was no evidence of collinearity among the variables (Tolerance for all variables ≥ .68; VIF for all variables ≤ 1.46).

5.10. Discussion

In line with the student study, the results suggest that spirituality, active coping and social support were all positively associated with growth among violent crime survivors (Prati & Pietrantoni, 2009). Furthermore, interpersonal event and number of event types were unrelated to PTG, consistent with the student study. Contrary to the findings of the student study and the crime survivor study hypothesis, the age at which the serious event occurred and PTS symptoms did not relate to PTG (Kashdan & Kane, 2011; Meyerson, Grant, Carter, & Kilmer, 2011). This highlights that although the students and crime survivors share some similar predictors of PTG despite previous adversity, the populations are not identical.

While the crime survivor study considered predictors of PTG among people exposed to frequent and often interpersonal adversity, little is known about cumulative adversity in samples that appear to function at a higher level. Trauma workers are not only exposed to adverse events through engagement with clients in occupational settings (Brockhouse et al., 2011; Cohen & Collens, 2013), but themselves experience adversity in their personal lives (London et al., 2017), and appear to maintain their occupational functioning (Veronese, Pepe, Massaiu, De Mol, & Robbins, 2017). There are few studies of factors related to PTG in trauma workers in relation to their own personal adversity (e.g. Armstrong, Shakespeare-Finch, & Shochet, 2014). It is possible that exposure to multiple and indirect adverse events may buffer against negative symptoms from their

own adversity (Samios et al., 2012). Therefore, the purpose of the trauma worker study is to investigate predictors of PTG in a sample of trauma workers in the aftermath of personal adverse events.

Trauma worker study

As with the student study, it was predicted that the age at which the serious event occurred, spirituality, active coping and social support would positively predict PTG in trauma workers. However, as their job role may encourage the development of coping techniques such as buffering from negative symptoms (Samios et al., 2012), it may be that interpersonal events, number of event types and PTS symptoms would be unrelated to PTG.

5.11. Method

5.11.1. Participants and procedure

Ninety-six trauma workers (87.5% female) volunteered to take part in this study. Participants were recruited using professional forums and snowball methods. The final sample consisted of 21 counsellors, 11 mental health nurses, 29 psychotherapists, 17 psychologists, three psychiatrists and 15 social workers or support workers. Table 2 presents demographic information for the sample. As with the student and crime survivor studies, no demographic variable was significantly associated with PTG when entered into a simultaneous regression model (all $p \geq .165$), and were therefore not analysed further. Procedures used to collect data were the same as outlined in the student study (section 5.5.).

5.11.2. Measures

Measures for this study were the same as those described in the student study (section 5.5.). The PDS (Foa et al., 1997) explored adverse history of the sample. The BVS (King et al., 2006), PTSD-8 (Hansen et al., 2010), 2-Way SSS (Shakespeare-Finch & Obst, 2011) and PTGI-SF (Cann et al., 2010) measured perceptions of spirituality (α

= .96), PTS symptoms (α = .90), social support (α = .94) and PTG (α = .92) respectively, each demonstrating excellent reliability. The Brief COPE (Carver, 1997) was employed to assess active coping, which demonstrated acceptable reliability (α = .77).

5.12. Results

5.12.1. Data screening

Missing values analysis (Little, 1988) indicated that the data were missing completely at random for the sample [χ^2 (172) = 179.15, p = .339]. As with the student and crime survivor studies, the proportion of missing data was small (1.1%) and was subsequently replaced with Expectation-Maximisation techniques. Shapiro-Wilks tests indicated that the age at serious event (p = .104) and PTG variables (p = .163) were normal, while all others were non-normal. Z skewness scores fell below ±3 for all variables, except for the number of event types (Z = 3.91) variable. The data were not transformed for reasons already outlined in the student study (see section 5.6.1.). The data met the assumption for linearity with the PTG dependent variable (Field, 2013).

5.12.2. Preliminary analyses

The prevalence of exposure to adverse events is presented in Table 2. The majority (86.5%) of the sample experienced more than one type of adverse event, with nearly two-thirds (64.7%) experiencing two to five event types and 20.8% experiencing six to ten event types. Like the student study, bereavement of a family member or friend was the single-most rated event considered to be serious by participants (26.0%). Nearly three-fifths of trauma workers (58.3%) reported interpersonal events such as child sexual abuse and physical assault, while over two-thirds of the sample (67.7%) experienced adversity below the age of 18. As with the student and crime survivor studies, most trauma workers (94.8%) scored 1 or more on the PTGI-SF, indicating that they reported some positive changes.

Means and standard deviations for the psychological measures are presented in Table 3. Pearson's correlations showed that spirituality/religiousness, active coping, PTS symptoms and social support were positively associated with overall PTG. The age the serious event occurred, interpersonal events and number of event types were unrelated to PTG.

A multiple regression analysis using the simultaneous method assessed the seven variables as potential predictors towards PTG among participants and produced a significant model, [F (7, 88) = 7.11, p < .001; Adj. R^2 = .31, f^2 = .45]. Spirituality (p = .013), active coping (p = .004) and social support (p = .005) emerged as the three significant positive predictors of PTG and are presented in Table 5. As with the student and crime survivor samples, collinearity was not identified in this sample (Tolerance for all variables ≥ .70; VIF for all variables ≤ 1.44).

Table 5. *Multiple regression results for student, crime survivor and trauma worker studies, with posttraumatic growth as the criterion*.

	Students (*N* = 101)			Crime survivors (*N* = 71)			Trauma workers (*N* = 96)		
	B	SE (B)	β	B	SE (B)	β	B	SE (B)	β
Interpersonal event[1]	-3.21	2.42	-.13	7.64	5.61	.13	-4.67	2.60	-.17
Number of event types	.62	.54	.11	-.60	.51	-.13	.76	.59	.13
Age at serious event	.26	.11	.19*	.07	.10	.07	.15	.10	.14
Spirituality	.13	.05	.23**	.25	.06	.40***	.16	.06	.23*
Active coping	2.08	.65	.29**	2.12	.87	.24*	2.11	.71	.27**
PTS symptoms	.47	.18	.22*	.10	.25	.05	.41	.21	.19
Social support	.12	.06	.17*	.15	.07	.25*	.22	.08	.26**

Note. **p* < .05, ***p* < .01, ****p* < .001. [1] Interpersonal event was dummy coded: 0 = no history of interpersonal event; 1 = history of interpersonal event.

5.13. Discussion

This study was the first to identify predictors of PTG among a sample of trauma workers, building on similar work in firefighters (e.g. Armstrong et al., 2014). As with studies A and B, the findings provided support for the hypothesis that spirituality, active coping and social support were necessary for PTG to occur in trauma workers. Neither event type nor number of event types were linked to growth, consistent with the hypothesis and the prior two studies on students and survivors of violent crime. As with the crime survivors, age at serious event did not predict PTG, although this was contrary to the student study findings. Collectively, the results support the robustness of spirituality, active coping and social support factors as predictors of growth. Meanwhile, the type of event, number of event types and PTS symptoms appear to vary among different populations of people exposed to adversity and do not influence PTG development.

5.14. General discussion

In the research presented, relationships between interpersonal events, number of event types, age at serious event, spirituality, active coping, PTS symptoms and social support on levels of PTG were explored. These factors were assessed in three samples of survivors exposed to different types of adversity where factors salient for PTG development may vary. Collectively, the predictive factors explained a significant proportion (between 31 and 39%) of the variance in PTG scores across the three studies. An encouraging finding was that regardless of life trajectory, participants in all three studies reported similar levels of PTG. This is perhaps not surprising given that PTG has been observed across a broad range of adversarial exposures (Linley & Joseph, 2004). Notwithstanding the apparent universality of PTG, this series of studies for the first time revealed some notable differences and similarities among the factors that were salient for growth to occur in three populations studied.

5.14.1. Active, religious or spiritual coping and posttraumatic growth

Across all three populations, active and spiritual coping strategies were the most robust factors related to PTG. Earlier reviews of the literature report large effect sizes for coping methods on PTG development overall (Prati & Pietrantoni, 2009). This is perhaps not surprising given that active and religious coping methods may reflect attempts to understand significant challenges brought about by adverse events (Tedeschi & Calhoun, 2004). Importantly, the findings indicate that regardless of life trajectory, people exposed to different types of adversity who employ active coping strategies perceived more PTG (Prati & Pietrantoni, 2009).

The presence and degree of spirituality was consistently associated with PTG in the three samples. This suggests that the use of existential beliefs can be found in the three populations investigated, with beneficial effects widely noted in the literature (Helgeson et al., 2006; O'Connor et al., 2003; Prati & Pietrantoni, 2009). In a paradoxical fashion, adverse events not only shatter assumptions but can lead to greater engagement with existential, philosophical or moral questions that represent growth (Tedeschi & Calhoun, 2004). It therefore appears that in some people, such strategies could enhance the sense of meaning in life or bring about a new engagement with religion and spirituality for many people.

5.14.2. Posttraumatic stress symptoms and posttraumatic growth

Relationships emerged between PTS and PTG in the student study only. The mixed findings across the three populations may be partly explained by psychosocial resources that survivors draw upon in order to mitigate negative effects. Students with less life experience of adversity may attribute greater significance to early or novel experiences (Sutherland & Bryant, 2005). This could exacerbate symptoms as processing of the event occurs (Tedeschi & Calhoun, 2004), but not so much as to overwhelm the survivor, allowing growth from the event. The lack of relationship between PTS and PTG among the survivors of violent crime appears contrary to assertions that

growth and distress co-exist (Lancaster et al., 2015). However, this may be explained by adaptive attempts to normalise or dissociate from such experiences to minimise distress (Hagenaars et al., 2011). It is this numbness to emotional experience that may account for the lack of PTS symptoms among the crime survivors. Alternatively, PTS symptoms may be of a severity as to overwhelm the crime survivors, thus inhibiting growth (Shakespeare-Finch & Lurie-Beck, 2014). Furthermore, trauma workers are in a unique position to experience cumulative stressors through their roles as well as their own personal adversity (Cohen & Collens, 2013). It is possible that growth in this group may buffer against PTS symptoms (Samios et al., 2012), as reflected by lower PTS scores. Collectively, the present findings suggest that PTS symptoms are particularly susceptible to the wider environmental and psychological contexts in which the samples function, which may lead to more (or less) PTG.

5.14.3. Social support and posttraumatic growth

Social support emerged as one of the most robust predictors of growth in all three studies. The presence of social support has been noted as a factor associated with recovery following adverse events (Ullman & Peter-Hagene, 2014), with the Study 1a findings reinforcing the benefits of social support as a potential buffer against stressful events (Linley & Joseph, 2004). It has been suggested that a recognition of one's own vulnerability following adverse exposure can lead to increased sensitivity towards other people and the revision of schemas which are an antecedent of PTG (Tedeschi & Calhoun, 2004). In addition, enriched social networks can bring out opportunities for disclosure that in turn promote positive outcomes (Ullman & Peter-Hagene, 2014). Importantly, social support appears to permeate across all types of adversity and populations, which highlights the significant role that the accessibility and maintenance of supportive networks play in post-event adjustment. This in turn could also implicate social support as a marker of psychological functioning (Newsom & Schulz, 1996), such

that those with pre-existing strengths to have and maintain relationships could experience more PTG compared to those with weaker social networks.[16]

5.14.4. Age at serious event and posttraumatic growth

An additional aspect of Study 1a was the inclusion of age at the time the serious event happened. Findings indicated that this factor was relevant to PTG among students only. While previous reviews have reported ambiguous relationships between age and PTG development (Helgeson et al., 2006; Meyerson et al., 2011), it has been suggested that the nature of the participants sampled may account for such discrepancies (Shakespeare-Finch & Lurie-Beck, 2014). The student sample was younger compared to the violent crime survivors and trauma workers. Younger samples are more likely to be confronted with novel adverse events in childhood and adolescence, which can represent significant challenges in a person's life (Sutherland & Bryant, 2005). The age at which the event occurred may be less salient for older samples that are more able to process both the positive and negative aspects of the event due to life experience (Barakat, Alderfer, & Kazak, 2006).

5.14.5. Interpersonal events and posttraumatic growth

The study determined that interpersonal events and the number of event types were not significantly related to PTG. The findings confirm the view that subjective interpretations of the event are more important for growth compared to the objective characteristics of the event (Joseph et al., 2012; Tedeschi & Calhoun, 2004), a widely-held assumption that had previously received limited empirical investigation. It had been speculated that interpersonal and frequent acts may in some way influence growth compared to naturally occurring or isolated events (Tedeschi, 1999), particularly as chronic adversity is associated with more severe pathology (Green et al., 2000; Hagenaars et al., 2011; Santiago et al., 2013). However, this suggestion is not supported

[16] A longitudinal study is needed to confirm the direction of the relationship, and this was explored as part of Study 4b.

by the current findings. As some survivors of interpersonal violence can experience growth and others do not (Elderton et al., 2017), other variables may determine whether PTG is reported, rather than the type of event itself.[17]

5.14.6. Number of event types and posttraumatic growth

The study found that the experience of multiple adverse events was unrelated to PTG. Evidence regarding this relationship is currently mixed (Kira et al., 2013; Kılıç et al., 2016), however, an emerging body of literature has suggested that multiple types of adverse events can buffer against perceptions of severity by allowing people to prepare for subsequent events, which may constitute growth in itself (Armstrong et al., 2014; Kunst et al., 2010b; Samios et al., 2012). In sum, the findings provide new insight into the role of event type and frequency on PTG development, where growth can occur regardless of prior exposure to adverse events. This is an encouraging development for psychological interventions that could target the psychosocial factors most closely associated with growth.

5.14.7. Strengths and limitations

There are strengths and limitations to research of this kind which should be noted. The study included a diverse range of adverse experiences within each sample ranging from common normative life stressors (i.e. bereavement and illness), to more seismic life-changing events (i.e. sexual abuse), which are likely more reflective of the experiences of some individuals. However, the modest sample sizes prevented the exploration of additional factors that differ among the samples. Second, the sample was recruited through snowballing methods (see Chapter 4, section 4.7.), which means that there are limitations about the inferences that can be drawn about the wider population based on the obtained sample. Third, data relied on self-reports which are advantageous in that participants are likely to identify with the questions and are more motivated to consider their own personalities rather than those of others (Paulhus & Vazire, 2007).

[17] This will be addressed further in Study 1b.

However, retrospective accounts of adverse event history and associated adjustment may have been influenced by tendencies to over or under-report information.

5.14.8. Implications

This study has important theoretical implications for understanding PTG among different samples of the general population who are exposed to adversity. The present studies contribute to recent literature that calls for an exploration of individual differences and commonalties in predictors of PTG (Lancaster et al., 2015), which are not duly accounted for in existing PTG models. The findings suggest that generalised models of PTG do not reflect the nuances of positive adjustment after adversity. Furthermore, the research draws attention to the role of cumulative events, which did not appear to influence PTG development although may buffer against PTS symptoms. Currently, the FDM only considers growth and processing in the aftermath of single, isolated incidents, which do not represent people who are exposed to multiple adverse events across the lifespan. Encouragingly, the present findings provide the first evidence that prior adversarial history does not necessarily affect the ability of survivors to report positive changes (Joseph et al., 2012; Tedeschi & Calhoun, 2004), unlike the PTS literature where interpersonal and frequent events are often associated with exacerbated negative symptoms (Green et al., 2000; Santiago et al., 2013). Importantly, the findings suggest that the mechanisms that underpin both PTG and PTS operate differently.

In respect of practical implications, efforts could focus on enhancing resiliency factors that predict PTG in these three populations. The present findings implicate active coping, spirituality and social support factors which may promote growth. In the case of spirituality, these findings do not imply that belief systems should be imposed or altered by clinicians; rather, these beliefs appear to be beneficial for PTG development. Collectively, the targeting of these robust coping and social support factors could promote a better quality of life as a result of improved social and occupational functioning (Hanson et al., 2010) and allow people to be in a better position to consider the positive

as well as negative aspects of their adverse experiences. Furthermore, given that the type or number of event types was unrelated to PTG, then different interventions may not be needed for different types of adverse event to support those in their growth experiences. Importantly, support should be directed towards mitigating the subjective impact on the individual cased by adverse events (Joseph & Linley, 2006).

5.14.9. Conclusion

Overall, the results across the three populations broadly support the salience of subjective interpretations in adjustment from adversity, in contrast to the objective characteristics of the event. The studies provide greater understanding of the dynamic nature of psychosocial factors. In particular, coping and social support variables remain robust predictors of PTG regardless of population or prior experiences of adversity. However, the age at serious event and PTS symptoms appear to display more nuanced relationships with PTG, which are not reflected within existing PTG frameworks.

Study 1b: Adverse event characteristics and posttraumatic growth – An investigation of mediating variables[18]

5.15. Introduction

It may be the case that the characteristics of the adverse event are less relevant compared to an individual's subjective interpretation of the event (Linley & Joseph, 2004). Study 1a suggested that event characteristics were not directly related to people's reports of PTG. However, this does not necessarily exclude the possibility of indirect associations between event characteristics and PTG through third variables.

Literature has noted that survivors of childhood, interpersonal and multiple types of adverse events may not universally experience PTG (e.g. Elderton et al., 2017; Gunst et al., 2016; Kehl et al., 2015; Kira et al., 2013; Shakespeare-Finch & Armstrong, 2010), suggesting there are other intervening variables that explain why more (or less) growth is experienced following adverse events. Given that event characteristics may differentially affect people's ability to experience PTG, there is a need to fully understand the mechanisms whereby the type, frequency and developmental timing of adverse events relate to PTG. If indirect relationships are identified between event characteristics and growth, it would imply the presence of psychological variables that may mediate outcomes and explain the mixed findings between event characteristics and PTG reported in the literature at present (see Chapter 2, sections 2.7.3.2, 2.7.3.3. and 2.7.3.4.). The rationale for the inclusion of specific mediating variables is set out in the following paragraphs.

[18] This study was published: Brooks, M., Graham-Kevan, N., Robinson, S., & Lowe, M. (2018). Trauma characteristics and posttraumatic growth: The mediating role of avoidance coping, intrusive thoughts and social support. *Psychological Trauma: Theory, Research, Practice, and Policy*.

5.15.1. Potential mediators of the relationship between event characteristics and posttraumatic growth

5.15.1.1. Intrusive thoughts

The FDM and ACPM are both primarily concerned with cognitive processes that drive PTG. A key element in these theories is the role of automatic and intrusive thoughts about the adverse event. These thoughts are often associated with the development of PTS symptoms and appear to be positively associated with growth (Stockton, Hunt, & Joseph, 2011; see Chapter 7, section 7.3. for further discussion). However, examining the cluster of PTS symptoms as one construct may in fact mask the contributions of individual symptoms towards PTG. For example, studies have indicated that other symptoms of PTS, such as hyperarousal, are largely independent of PTG (Hall, Saltzman, Canetti, & Hobfoll, 2015; Shigemoto & Poyrazli, 2013). In contrast, intrusions are thought to represent natural processing of the event, and while often distressing, can drive other cognitive processes in the search for meaning (Tedeschi & Calhoun, 2004). Literature (Helgeson, Reynolds, & Tomich, 2006) finds positive associations between intrusive thoughts and PTG, with childhood, interpersonal and multiple event types related to more intrusions (Graham-Kevan et al., 2015; Shakespeare-Finch & Armstrong, 2010). As well as directly predicting psychological outcomes, intrusive thoughts have been found to mediate relationships in relation to a variety of negative sequalae, such as between violence exposure and depression (Kliewer, Lepore, Oskin, & Johnson, 1998). It would seem, according to the FDM and the aforementioned literature, that intrusive thoughts could be critical to whether people experience PTG. However, the extent to which intrusions mediate positive outcomes, and equally, the degree to which they influence PTG depending on event characteristics, is unclear.

5.15.1.2. Coping strategies

The FDM and ACPM also acknowledge that psychosocial factors, such as coping and social support, can aid the processing of adverse events and therefore enhance

PTG (Tedeschi & Calhoun, 2004). A plethora of studies and reviews (e.g. Helgeson et al., 2006; Prati & Pietrantoni, 2009) have generally focused on adaptive forms of coping thought be associated with PTG. Specifically, spiritual and active coping methods (see Chapter 2, section 2.7.) are consistently associated with increased growth (Prati & Pietrantoni, 2009), as they can trigger a rebuilding of spiritual beliefs and reflect problem-focused attempts to understand the meaning behind the event, respectively (Walker et al., 2009). Therefore, the type or frequency of adverse events may indirectly relate to PTG through positive coping mechanisms.

Comparatively less literature has examined the role of avoidant and emotional coping strategies on PTG (see Chapter 2, section 2.7.). Avoidant coping may influence relationships between event characteristics and PTG as a result of disengaging from thoughts about the event. Some literature has found avoidant coping to positively predict PTG (London et al., 2017), thus emphasising the role of maladaptive coping in the growth process, although other studies have found an absence of any such relationship (Wild & Paivio, 2004). Likewise, emotional coping attempts have demonstrated mixed effects on adjustment after adversity (Larsen & Berenbaum, 2015; Litman, 2006). Coping is said to be flexible across situations, with ineffective strategies modified or discontinued in response to a particular stressor (Kato, 2012). For example, active coping may be a useful strategy in response to an isolated event, but not in a prolonged situation that is outside of the person's control. Thus, the nature of the event may determine which type of coping strategy can mitigate against distress, and therefore reflect the degree of PTG experienced.

5.15.1.3. Social support

The effectiveness of social support may vary according to the type of events experienced. While any adversity can be potentially distressing, interpersonal trauma, such as sexual assault and rape, is thought to be particularly difficult to disclose due to its deeply personal nature (Kılıç et al., 2016), with negative reactions upon disclosure associated with greater distress (Ullman & Peter-Hagene, 2014). Therefore, event

characteristics may influence the degree of social support received, which in turn could promote or inhibit PTG.

5.16. Aims of study

People can react differently to negative life events, and their psychological responses to the event do not always result in PTG (Linley & Joseph, 2004). Intrusive thoughts, coping and social support factors have been widely assessed as direct predictors of PTG, yet their role as potential mediators between event characteristics and growth is unknown. In addition, Study 1a might not have been sensitive enough to detect the individual impact of event characteristics on PTG, as these factors were assessed for their direct (rather than indirect) relation to PTG. Understanding the psychological processes activated in response to different types of adverse events would provide greater clarity as to the role of psychosocial factors within the FDM and ACPM models.

The study assessed the impact of three event characteristics (interpersonal event, number of event types and childhood adversity) on PTG through mediating psychosocial factors (active coping, avoidant coping, emotional coping, intrusive thoughts, social support and spirituality). The study will explore whether: (a) active coping, intrusions, social support and spirituality mediate between interpersonal event and PTG; (b) active coping, intrusive thoughts, social support and spirituality would mediate between multiple event types and PTG; (c) active coping, intrusive thoughts, social support and spirituality would mediate between childhood adversity and PTG. It is suggested that the aforementioned factors will lead to an increase in attempts to process the adverse event experienced. No hypotheses were generated for avoidant and emotional coping in three models, due to inconsistent findings (Larsen & Berenbaum, 2015; London et al., 2017; Wild & Paivio, 2004).

5.17. Method

5.17.1. Participants and procedure

The sample for Study 1b comprised the combined samples of students, violent crime survivors and trauma workers from Study 1a. A combined sample was used for four reasons. First, participants in each of the three subsamples reported a similar level of PTG,[19] the key study variable of interest, suggesting that growth can be reported regardless of life background. Second, PTG studies that combine participants from different sources are not uncommon (e.g. Schultz, Tallman, & Altmaier, 2010; Smith & Cook, 2004), as participants are all individuals who have experienced at least one adverse event. Third, a larger sample would permit the study of additional variables and multiple mediators simultaneously (Hayes, 2013). Fourth, multiple mediation models do not prevent the investigation of individual differences that would be inherent even within more homogenous samples (Saunders et al., 2016).

The newly combined sample comprised 268 self-selecting individuals from northwest England who accessed the survey via university online advertisements (37.7%), victim support services or online forums (26.5%), and professional networking websites (35.8%). The sample was predominantly female (81.3%), heterosexual (85.1%) and of White ethnicity (83.5%), with a mean age of 33.80 years (*SD* = 12.31). Around a third of participants were either single (32.2%) or dating/cohabiting (34.8%). Over one third (40.4%) of the sample were atheist, and a proportion (16.1%) reported a disability. Preliminary analysis indicated that PTG did not differ according to gender, sexuality, marital status or disability (all $p \geq .21$). Age was unrelated to PTG ($r = .05$, $p = .414$). Analysis was not conducted to assess for differences in PTG by ethnicity, as there was a large discrepancy between numbers of White (*N* = 222) and non-White (*N* = 44)[20] participants, hence this finding may not be reliable (Sears et al., 2003). Consistent with

[19] This was confirmed using a one-way analysis of variance (ANOVA), which indicated no significant differences in PTG across students, crime survivors and trauma workers [F (2, 265) = 2.20, $p = .114$, $\eta^2 = .02$].

[20] Numbers do not add up to 268 as ethnicity information was missing for two participants.

literature (Shaw et al., 2005), participants identifying as religious reported significantly more PTG (M = 27.85) than atheist (M = 21.36) participants [t (266) = 4.10, p < .001, d = .51].

Adverse history of the combined sample is presented in Table 6. As required by the study, all participants experienced at least one adverse event, although the vast majority (92.2%) reported two or more separate events. Over two-thirds (68.3%) of the sample recorded at least one interpersonal event.[21] The average age the most serious adverse event occurred was 20.36 years (SD = 11.95; range 1 to 56 years old). Most participants (22.8%) reported their severe event to be bereavement.

Table 6. *Frequency of adversity exposure in the sample.*

Adversity type	*N*	%
Accident	130	48.5
Natural disaster	26	9.7
Serious attack/threat by partner	80	29.9
Serious attack/threat by other	102	38.1
Child sexual abuse	93	34.7
Rape by partner	36	13.4
Rape by other	55	20.5
Imprisonment	24	9.0
Military conflict	15	5.6
Serious or terminal illness	72	26.9
Bereavement	140	52.2
Neglect	86	32.1
Other event	50	18.7

[21] Consistent with Study 1a, interpersonal events were considered to involve deliberately perpetrated acts by one person towards another, or where there is usually an intent to cause harm through a specific act (Mauritz et al., 2013).

5.17.2. Measures

Adverse event history. The 12-item checklist from the PDS (Foa et al., 1997; see section 5.5.2. for description) used in Study 1a recorded prior history of adverse events.

Spirituality. The 20-item BVS (King et al., 2006; see section 5.5.2. for description) measured religious and spiritual beliefs and was used in Study 1a. The internal consistency was high for Study 1b (α = .96).

Coping styles. The 28-item Brief COPE (Carver, 1997; see section 5.2.2. for description) used in Study 1a examined coping styles. While the measure has the advantage of brevity, it assesses 14 coping styles using only two items per subscale. The use of fewer than three items for a subscale can lead to difficulties in replication and stability of the measure (Raubenheimer, 2004). Therefore, principal components analysis (PCA) was undertaken to aggregate the scales to a more manageable number of coping strategies and increase the internal consistency of the Brief COPE.

The data satisfied the ratio of at least five observations per item and a fair sample size of over 200 participants (Tabachnick & Fidell, 2013). As it was assumed the coping factors would be correlated in some way, an oblique rotation using the Direct Oblimin method was conducted. The suitability of the PCA was confirmed by the Kaiser-Meyer-Olkin measure of sampling adequacy (.76) which exceeded the minimum value of .60 (Kaiser, 1974), and a significant Bartlett's test of sphericity result [χ^2 (378) = 3291.54, p < .001]. Eigenvalues of less than one and factor loadings of less than .30 were not considered significant in the analysis according to established procedures (Tabachnick & Fidell, 2013).

A scree plot was first inspected to identify the suitable number of factors to extract from the PCA, shown in Appendix IV. It revealed the presence of three viable factors, demonstrated by the flattening line after the third factor (Tabachnick & Fidell, 2013). However, inspection of scree plots alone can be regarded as a subjective process

(Hayton, Allen, & Scarpello, 2004), and so a Monte Carlo parallel analysis was run using statistical software developed by Watkins (2005) to determine the suitable number of factors. The number of extractable factors is identified based on the number of eigenvalues from the SPSS experimental data that exceed those from the parallel analysis (Watkins, 2005). In this instance, three eigenvalues factors from the data exceeded those in the randomly generated data set. Furthermore, the results from the parallel analysis were visually compared with the scree plot to determine the suitable number of factors, and three factors were found to be appropriate.

The three-factor solution cumulatively explained 41.33% of the variance in coping items. The factorised solution and item loadings is presented in Appendix V. Factor one (emotional coping; α = .82) consisted of eight items endorsing strategies that may reduce the intensity of emotions, such as venting. Factor two (avoidant coping; α = .77) featured 10 items indicating more indirect ways of coping with stress, such as disengagement, distraction and substance use. Factor three (active coping; α = .78) included 10 items that were symbolic of resourceful attempts to mitigate the effects of stress, such as acceptance, planning and positive reframing. All Cronbach alphas were appropriate and demonstrated improved reliabilities compared to Study 1a for the Brief COPE.

Social support. The 2-Way SSS (Shakespeare-Finch & Obst, 2011; (see section 5.5.2. for description) from Study 1a was used to measure perceptions of social support. The questionnaire demonstrated high internal consistency (α = .94).

Posttraumatic stress. The PTSD-8 (Hansen et al., 2010; see section 5.5.2. for description), used in Study 1a was employed to measure intrusive thoughts symptomatic of PTS. As intrusive thoughts are most strongly related to PTG processes than other dimensions of PTS (see Chapter 2, section 2.7.2.), only the four items that comprised the intrusive subscale were used. Reliability for the intrusive subscale was good (α = .86).

Posttraumatic growth. The 10-item PTGI-SF (Cann et al., 2010; see section 5.5.2. for description) was used to measure perceived positive changes from the adverse event. The measure demonstrated high internal consistency in the current study (α = .91).

5.17.3. Data analysis

First, Pearson's correlations examined the magnitude and direction of associations between key study variables (see section 5.5.3). Next, mediation analyses were conducted to determine indirect effects (*ab*) with 5000 bootstrapped samples and bias-corrected 95% confidence intervals (BCa CI) using the SPSS PROCESS macro (Hayes, 2013). In contrast to Baron and Kenny (1986), Preacher and Hayes' (2008) method is primarily concerned with the overall indirect effect rather than the significance level of each individual path in the mediation model, which may not detect all effects of the predictor (X) on the outcome variable (Y). This approach to mediation is more powerful than casual steps analysis as it does not require all paths to be significant. Confidence intervals that do not contain zero indicate a significant indirect effect. Unstandardised regression coefficients, direct and indirect effects are reported in line with current recommendations (Hayes, 2013), although completely standardised indirect effect sizes (ab_{cs}) are also provided in this study to allow for consideration of effect sizes. Effect sizes are identified as small (ab_{cs} of .01 to .08), medium (ab_{cs} of .09 to .24) or large (ab_{cs} > .25; Preacher & Kelley, 2011).

Three separate mediation analyses were conducted with interpersonal event, number of event types and childhood adversity as independent variables (see Figure 5 for visualisation).[22] Spirituality, active coping, avoidant coping, emotional coping,

[22] Structural equation modelling (SEM) was considered as an option to examine all variables within a single model. However, this would introduce unnecessary complexity into the interpretation of the findings if all independent variables and mediators were included, which may 'wash out' any effects. In addition, overly complex models would go against the parsimonious nature of SEM (Kline, 2016). As so few studies of event characteristics and PTG exist, modelling the effects of each event characteristic separately would allow their independent contribution towards PTG via the mediators to be evaluated.

intrusive thoughts and social support were entered as mediators. While the specification of the models was theoretically driven, recommendations for cross-sectional mediation analyses (Preacher & Hayes, 2004) suggest that reverse models are tested to provide support for the directionality of relationships. Within these models, event characteristics preceded PTG as the latter arises from the emotional struggle with adversity (Tedeschi & Calhoun, 2004); however, the mediator and outcome (PTG) were substituted to allow for plausible bidirectional associations. For example, while intrusions, social support and spirituality may mediate associations between event characteristics and growth, literature also indicates that increased distress, enhanced relationships and greater spirituality are also a product of PTG (Tedeschi & Calhoun, 2004). The reverse mediation analysis results and discussion are presented separately in Appendix VI.

To minimise type I errors given the number of variables in the bivariate correlational analysis, a more conservative alpha level of $p < .01$ was used. However, an alpha level of $p < .05$ was retained for both direct and indirect effects in the mediation analysis as it has paths equivalent to partial correlations. Unlike multiple regression in Study 1a, mediation analysis uses bias-corrected bootstrapping methods which increase power, and so power analysis is not required (Hayes, 2013). Furthermore, corrections to alpha values were made for directional hypotheses by halving *p* values (Field, 2013).

5.18. Results

5.18.1. Preliminary analyses

Means, standard deviations and correlations for the key study variables are presented in Table 7. Nearly all participants in the sample (96.6%) scored 1 and above on the PTGI-SF measure, suggesting at least some positive changes from their experiences. Correlational analyses indicated that event characteristics were more closely related to intrusive thoughts, rather than PTG. PTG was found to be unrelated to avoidant coping, negatively related to childhood adversity and positively associated with

active coping, emotional coping, intrusive thoughts, social support and spirituality (p < .01).

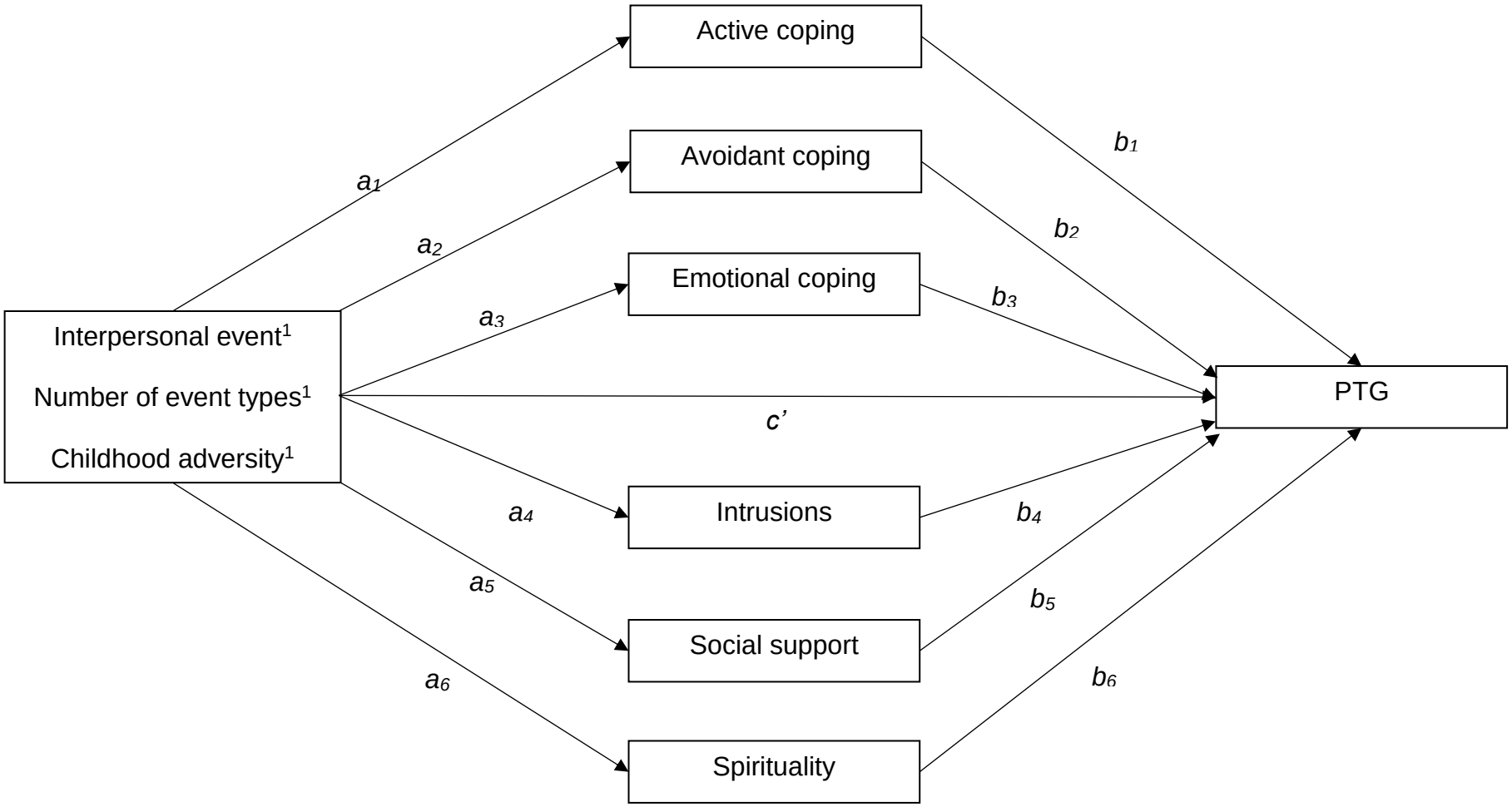

Figure 5. Multiple mediator model depicting psychosocial factors as mediators of the relationship between event characteristics and PTG.

[1]These characteristics were entered as independent variables in the three separate multiple mediation models.

Table 7. *Descriptive statistics and intercorrelations between key study variables*.

	M	*SD*	Range	1	2	3	4	5	6	7	8	9	10
1. Interpersonal event[a]	-	-	-	-									
2. Number of event types	4.03	2.48	1–13	.45***	-								
3. Childhood adversity[a]	-	-	-	.18***	.13*	-							
4. Active coping	16.14	5.80	0–26	.08	.10	-.08	-						
5. Avoidant coping	9.28	5.59	0–30	.08	.22***	.21***	.08	-					
6. Emotional coping	10.28	5.51	0–24	.06	.01	-.04	.46***	.19**	-				
7. Intrusions	6.14	3.26	0–12	.25***	.31***	.15*	.12	.50***	.19**	-			
8. Social support	76.93	19.50	16–105	-.14*	-.15*	-.13*	.22***	-.43***	.25***	-.22***	-		
9. Spirituality	37.89	21.26	0–79	.07	.12	-.11	.12*	-.05	.43***	.13*	.19**	-	
10. Posttraumatic growth	25.23	13.09	0–50	.02	.07	-.16*	.42***	-.09	.43***	.22***	.30***	.42***	-

Note. [a] Interpersonal event was dummy coded: 0 = no interpersonal event; 1 = interpersonal event. Childhood adversity was dummy coded: 0 = no childhood adversity; 1 = childhood adversity. *$p < .05$, **$p < .01$, ***$p < .001$.

5.18.2. Mediation analysis

The results of the mediation analyses are presented in Table 8. In respect of the first hypothesis, the mediation model with interpersonal event and psychosocial mediators explained 40% of the variance in PTG scores [F (7, 260) = 25.04, p < .05]. Significant direct effects (p < .05) between interpersonal event and PTG were observed for intrusive thoughts and social support only. For indirect effects, intrusions demonstrated significant positive (ab_{cs} = .07; BCa CI: [.03, .12]) and social support significant negative (ab_{cs} = -.02; BCa CI: [-.05, -.03]) indirect effects on the relationship with PTG when controlling for all other psychosocial variables.

The second mediation model with number of event types revealed few direct effects [F (7, 260) = 24.70, p < .05]. Significant direct effects (p < .05) between number of event types and PTG were found for avoidance coping, intrusive thoughts and social support. The model explained 40% of the variance in PTG scores and revealed that avoidant coping (ab_{cs} = -.04; BCa CI: [-.09, -.02]) and social support (ab_{cs} = -.02; BCa CI: [-.05, -.01]) exerted significant negative indirect effects on the relationship between number of event types and PTG. Intrusive thoughts significantly and positively mediated (ab_{cs} = .08; BCa CI: [.04, .13]) the same relationship.

Finally, the third model with childhood adversity as the independent variable explained 41% of the variance in PTG scores [F (7, 260) = 25.35, p < .05]. Significant direct effects (p < .05) were observed for avoidance coping, intrusive thoughts and social support on PTG. In terms of mediation, avoidant coping (ab_{cs} = -.04; BCa CI: [-.09, -.02]) and social support (ab_{cs} = -.02; BCa CI: [-.05, -.01]) displayed significant negative indirect effects on the association between childhood adversity and PTG, while intrusions demonstrated a positive indirect effect (ab_{cs} = .04; BCa CI: [.01, .08]).

Table 8. *Results of multiple mediation analyses examining direct and indirect effects of event characteristics on posttraumatic growth through psychosocial factors*.

Independent variable (*X*)	Mediator (*M*)	Direct effect (*c'*)			Indirect effect (*ab*)			
		b	*SE*	*p*	*b*	Boot *SE*	Lower 95% BCa	Upper 95% BCa
		Posttraumatic growth (*Y*)						
Interpersonal trauma	Active coping	1.04	.76	.171	.67	.52	-.26	1.82
	Avoidant coping	.95	.73	.194	-.48	.38	-1.42	.15
	Emotional coping	.70	.72	.332	.26	.30	-.16	1.05
	Intrusive thoughts	**1.71**	**.41**	**<.001**	**1.85**	**.58**	**.89**	**3.16**
	Social support	**-5.84**	**2.54**	**.022**	**-.44**	**.30**	**-1.30**	**-.04**
	Spirituality	3.29	2.79	.239	.52	.46	-.28	1.61
		Posttraumatic growth (*Y*)						
Number of trauma types	Active coping	.23	.14	.107	.15	.11	-.04	.40
	Avoidant coping	**.48**	**.14**	**<.001**	**-.23**	**.10**	**-.46**	**-.09**
	Emotional coping	.02	.13	.873	.01	.06	-.10	.14
	Intrusive thoughts	**.41**	**.08**	**<.001**	**.42**	**.13**	**.21**	**.71**
	Social support	**-1.18**	**.48**	**.013**	**-.10**	**.06**	**-.26**	**-.02**
	Spirituality	1.01	.52	.054	.16	.10	-.01	.39

Table 8 (continued).

Independent variable (*X*)	Mediator (*M*)	Direct effect (*c'*)			Indirect effect (*ab*)			
		b	*SE*	*p*	*b*	Boot *SE*	Lower 95% BCa	Upper 95% BCa
		Posttraumatic growth (*Y*)						
Childhood trauma	Active coping	-.96	.72	.179	-.59	.49	-1.69	.24
	Avoidant coping	**2.37**	**.68**	**.001**	**-1.06**	**.45**	**-2.21**	**-.38**
	Emotional coping	-.43	.68	.531	-.16	.28	-.84	.31
	Intrusive thoughts	**.99**	**.40**	**.009**	**1.03**	**.47**	**.28**	**2.14**
	Social support	**-5.26**	**2.39**	**.028**	**-.44**	**.29**	**-1.24**	**-.04**
	Spirituality	-4.69	2.61	.073	-.70	.44	-1.74	.00

Notes. Boot *SE* = bootstrapped standard error; 95% BCa = 95% bias-corrected confidence interval; Boldface values indicate significant effects ($p < .05$); *c'* = unstandardised direct effects of the independent variable on the dependent variable ($X \rightarrow Y$) controlling for the mediator; *ab* = unstandardised indirect effects of the independent variable on the dependent variable via the mediator ($X \rightarrow M \rightarrow Y$).

5.19. Discussion

Since the concept of PTG was postulated, research has been undertaken to explore the factors that may make growth more likely to occur. Study 1b aimed to extend the existing FDM and ACPM frameworks (Joseph et al., 2012; Tedeschi & Calhoun, 2004), which do not explicitly identify how specific coping, intrusions and social support factors result in positive change as a function of the type, frequency or developmental timing of adversity experienced. While these psychosocial factors have been traditionally explored as direct predictors of growth, the current study went further to determine indirect relationships between event characteristics and PTG. Adverse events themselves do not result in growth, and so three hypotheses were presented that anticipated that active coping, intrusive thoughts, social support and spirituality would separately explain relationships between the type, frequency and timing of adverse event, and PTG. As subjective interpretations of the event are thought to be key to psychological adjustment (Linley & Joseph, 2004), it is important to identify the mechanisms that indirectly link event characteristics to positive change.

5.19.1. Mediators of the interpersonal event and posttraumatic growth relationship

Results of the current study generally supported hypotheses made regarding the relationship between event types, psychosocial factors and PTG. Intrusive thoughts mediated the indirect relationship between interpersonal events and PTG. Interpersonal acts are generally associated with increased PTS symptoms compared to non-interpersonal events (Courtois, 2008; Santiago et al., 2013), yet intrusive thoughts may have adaptive value. Within the FDM and ACPM, intrusive thinking is conceived as a natural response to stressful experiences that are seismic enough to challenge world views (Joseph et al., 2012; Tedeschi & Calhoun, 2004). These automatic thoughts can precipitate more deliberate attempts to reassess the event, which can lead to PTG (Stockton et al., 2011). Social support also exerted indirect effects on PTG. Interpersonal events of a deeply personal nature may be particularly difficult to disclose to others,

especially if perpetrated by those in the person's immediate social environment (Kılıç et al., 2016). Yet the presence of social networks could buffer against stress (Schumm et al., 2006) or provide opportunities to adopt new perspectives associated with increased growth (Tedeschi & Calhoun, 2004). Intrusions and social support therefore appear to mediate PTG following interpersonal events.

5.19.2. Mediators of the number of event types and posttraumatic growth relationship

The present research also addressed a gap in the PTG literature in respect of the contribution of multiple event types on perceived growth. Intrusive thoughts mediated the relationship between more frequent event types and PTG. This again underlines the importance of intrusions within the PTG process as indicated in the FDM and ACPM frameworks (Stockton et al., 2011; Tedeschi & Calhoun, 2004). The relationship between multiple event types and PTG was also explained by avoidance coping. This coping strategy may be particularly adaptive in circumstances where the person may lack control over their ability to manage multiple types of stressors (Kato, 2012). However, there was no evidence to support that PTG in this sample could reflect illusory growth, as less avoidance was associated with more growth in the mediation model (Zoellner & Maercker, 2006). Furthermore, and in line with expectations, the indirect pathway through social support was again significant in this model. Multiple event types can adversely impact on interpersonal relationships through decreased trust and increased withdrawal from social situations (Cloitre et al., 2009; Courtois, 2008). However, social support can promote more effective coping strategies that encourage growth (Prati & Pietrantoni, 2009), and buffer against the impact of cumulative events (Schumm et al., 2006). Overall, multiple event types could encourage coping strategies conducive to PTG.

5.19.3. Mediators of the childhood adversity and posttraumatic growth relationship

Finally, the study also provided insight into potential mediators of PTG following childhood adversity. Consistent with the other models, intrusive thoughts mediated relationships with growth. Childhood adversity is also thought to be related to psychological adjustment in later life, leading to an increased risk of PTSD in adulthood (Courtois, 2008); however, the findings suggest that intrusive thoughts following childhood adversity are equally crucial in the development of PTG. The FDM asserts that intrusions signify cognitive processing indicative of the growth process (Tedeschi & Calhoun, 2004). Consistent with other research (London et al., 2017), childhood adversity was unrelated to PTG, although had an indirect effect via avoidance coping. Evidence indicates greater use of avoidance coping in childhood trauma survivors (Punamäki, Muhammed, & Abdulrahman, 2004; Simons, Ducette, Kirby, Stahler, & Shipley, 2003), which may arise out of a need to maintain relationships with abusive caregivers for survival purposes (Freyd, 1994). While an adaptive strategy to reduce distress, the results suggest a reduction in avoidance coping can enhance PTG following childhood adversity. This finding may imply a more constructive aspect of growth that is associated with less reliance on maladaptive strategies that perpetuate distress in the long-term (Zoellner & Maercker, 2006). Social support also exerted indirect effects on the relationship between childhood trauma and PTG. Childhood adversity may create difficulties forming social relationships that are necessary to develop additional perspectives needed for PTG (Courtois, 2008; Tedeschi & Calhoun, 2004). Intrusive thoughts, avoidant coping and social support can therefore promote PTG in childhood trauma survivors.

5.19.4. Non-significant mediators

Contrary to expectations, and some recent literature (London et al., 2017), the indirect pathways for active coping and spirituality were not significant in the three

models. This is surprising as both constructs have been shown to strongly and positively influence PTG (Prati & Pietrantoni, 2009). Some research has suggested that coping methods may be related to the wider environment (Kato, 2012). In this context, active coping attempts would be frustrated in situations where there are little opportunities to effect change. This may be relevant in cases of protracted adversity where active coping may serve little adaptive purpose and increase stress. Furthermore, emotional coping did not mediate PTG in any model. As emotional coping is intertwined with revisiting distressing memories (Litman, 2006), it may not be viewed as adaptive compared to avoidant strategies that minimise distress (Kato, 2012). However, this is not to say that emotional coping is entirely unrelated to PTG, as research on emotional regulation strategies and PTG is very limited (Larsen & Berenbaum, 2015). The items that measured this variable did not differentiate between different emotional coping strategies used by people, which could have either helpful or harmful effects on recovery (Larsen & Berenbaum, 2015). In this regard, it is possible that there may be two competing pathways where emotional strategies could differentially relate to PTG, which may explain the null finding in Study 1b. Displays of distress could highlight a need for support, while other types of emotional responses, such as increased anger and rumination, may negatively impact on social relationships. These mechanisms could either increase or decrease the likelihood of PTG, respectively.

5.19.5. Strengths and limitations

The study is not without limitations. The cross-sectional nature of this study means that causality between factors responsible for PTG cannot be strongly established, although reverse models were tested to enhance confidence in the directionality of the findings. While the models accounted for up to 41% of the variance in PTG scores, they demonstrated small effect sizes. This finding implies that other factors may mediate growth, such as the perceived severity of the event and type of rumination (García, Cova, Rincón, & Vázquez, 2015; see Study 3). Additionally, the

results do not speak as to whether *actual* growth has occurred (Zoellner & Maercker, 2006), and only reflect *perceived* PTG (see Chapter 2, section 2.6.2.1.).

5.19.5. Implications

The study highlighted how specific psychosocial factors are more or less conducive to PTG dependent upon the characteristics of the adverse event experienced. Interventions may be more responsive if clinicians are mindful of the adversity backgrounds within their clients, which provide a better indication of PTG rather than focusing on growth from a single event (Kira et al., 2013). Avoidance coping, intrusive thoughts and social support were affected by event characteristics and subsequently influenced PTG. As psychosocial factors may be context-dependent (Kato, 2012), it may be that event-specific efforts to reduce a reliance on avoidance coping, guide more effortful intrusive thought processes and identify positive social support networks could benefit PTG in those with interpersonal, multiple and childhood adversity.

5.20. Chapter summary

The current study was the first to identify how adverse event characteristics impact on specific psychosocial factors that may explain why some people report more (or less) PTG. Intrusive thoughts and social support were found to be robust mediators that explain this relationship compared to avoidance coping, which was less consistent across characteristics. It is therefore important to understand the impact of event characteristics on psychological functioning to tailor appropriate support to encourage PTG. At the same time, the quantitative findings alone may not fully explain why some people experience different levels of PTG, and so this will be explored further in Study 2.

CHAPTER SIX: The experience of posttraumatic growth – A qualitative investigation[23]

6.1. Chapter introduction

Study 1 identified mediators of relationship between event characteristics and PTG among people using objective quantitative methods. Yet by extension, this confines adverse experiences to narrow accounts that do not fully reflect the complexity of human perception. Importantly, it has been noted that not all individuals grow similarly as there is great variability among experiences (Tedeschi & Calhoun, 2004). Some people may only experience PTG in certain aspects of their life and no changes in other domains, while others may not report any growth at all. While Study 1 drew attention to the importance of psychosocial factors in psychological adjustment following adverse events, it did not fully explain why some people are likely to experience more PTG than others. Individual differences in PTG experiences can be further explored using more flexible qualitative methods (see Chapter 4, section 4.4.3).

6.1.1. Qualitative research on posttraumatic growth

While the dominant quantitative paradigm in PTG research can examine factors associated with growth, there is comparatively little research in qualitatively exploring people's *experiences* of PTG. There have been arguments for further qualitative investigations of PTG (Hefferon et al., 2009; Massey, Cameron, Ouellette, & Fine, 1998), which could provide a more holistic understanding of growth. The qualitative studies that currently exist tend to focus on growth experiences in samples exposed to a specific type of adverse event. To date, this has included military conflict (Palmer et al., 2017), child sexual abuse (Woodward & Joseph, 2003), bereavement (Davis, Wohl, & Verberg, 2007), IPV (Anderson, Renner, & Danis, 2012), incarceration (Depner et al., 2017;

[23] This study is under review: Brooks, M., Graham-Kevan, N., Robinson, S., & Lowe, M. (under review). "Finding myself again": Processes and outcomes of posttraumatic growth in survivors of cumulative trauma. *Psychology and Psychotherapy: Theory, Research, and Practice*.

Vanhooren et al., 2017) and professionals working with people exposed to adverse situations (Cohen & Collens, 2013). However, the historical focus on growth in the context of specific events does not reflect the broad range of adversity that can be experienced across the lifespan. This specific focus means it has not yet been possible to fully explore the growth perceptions of people with a diverse range of adverse experiences, which may or may not be the same as individuals who experience isolated events. Appropriately, qualitative methods can offer provide a 'trajectory of agency' (Massey et al., 1998, p. 351) that illustrates how the process of PTG unfolds over time. Qualitative evidence will help to provide greater clarity as to how some people shift from confrontations with adversity and navigate towards growth, in a process which may not be fully captured in the FDM and ACPM models. Therefore, the present study will be able explore the intra-individual experiences of people who have faced multiple types of adversity which cannot be captured through quantitative means, or is currently addressed by extant qualitative literature.

In order to understand more fully the nature of PTG, it is important to examine the context in which positive changes can occur. While the FDM and ACPM primarily acknowledge the role of cognitive processes (Joseph et al., 2012; Tedeschi & Calhoun, 2004), less attention is given to the social and environmental conditions where PTG can emanate. Qualitative evidence can, therefore, not only identify cognitive processes but provide more context by revealing distinctions within the narratives that people use to find meaning in challenging circumstances (Massey et al., 1998). It can also identify the behavioural components of growth, which are neglected by quantitative measures that only tend to focus on thoughts or feelings associated with PTG. As such, qualitative investigations can explore the wider social and environmental factors where experiences of growth occur, as well as the cognitive, emotional, psychological *and* behavioural outcomes associated with positive change. Furthermore, qualitative studies can provide more detail as to the processes and outcomes associated with PTG, thus addressing a central aim of this thesis (see Chapter 3). Interviews could reveal other critical

psychological resources which people draw upon in their growth experiences, thus informing clinical efforts to monitor or support PTG.

Existing quantitative measures of growth are largely based on a specific interpretation of PTG, as measured through the PTGI (Tedeschi & Calhoun, 1996). This measure (see Study 1, section 5.5.2. for description) asks people to rate their perceptions of change in five life domains (discussed in Chapter 2, section 2.4.) which may not necessarily reflect the way in which *all* participants themselves perceive growth. Indeed, some qualitative studies (e.g. Beck, Rivera, & Gable, 2017; Hussain & Bhushan, 2013; Shakespeare-Finch, Martinek, Tedeschi, & Calhoun, 2013) have relied on this predetermined factor structure of PTG to qualitatively examine growth, which may have excluded a wider range of growth experiences. Unlike quantitative studies, qualitative methods place no prior assumptions about relationships and outcomes in a given study (see Chapter 4, section 4.3.). Thus, using such an approach does not overlook the varied and unique set of benefits and outcomes that are associated with PTG.

6.2. Aims of study

Study 2 sought to contextualise the findings of Study 1 and prior literature by exploring the salient features of PTG among people who have experienced multiple and different types of events. In line with the thesis aims (see Chapter 3, section 3.2.), this would be achieved by addressing: (1) individual differences in perceptions of positive and negative change following adversity; and (2) identifying factors that can inhibit or facilitate PTG. As this study is exploratory in nature, no prior hypotheses were made.

6.3. Method

6.3.1. Participants

Participation for this study was only open to those who took part in Study 1 so their initial responses could be explored in greater depth. Of the 268 participants in Study 1, 166 (61.9%) agreed to be contacted in relation to potential participation in the current

study. Successful contact was made with 73 people (44.0% response rate) via email, who provided data for longitudinal purposes (see Study 4, section 9.4.). Of the 73 participants, a sub-sample of 26 attended semi-structured interviews, representing a completion rate of 35.6%.[24] This sample size exceeded the minimum number of 12 participants suggested by Guest et al. (2006) for qualitative interviews, who found that after this point, data saturation occurs as key themes and ideas are repeated in later interviews and no new knowledge is generated.

Interview participants were 17 females and nine males aged between 21 and 61 years old (*M* = 35.69; *SD* = 12.28). The sample was predominantly White (80.8%) and heterosexual (88.5%), with exactly half identifying as single (50.0%). Participants largely and nominally identified as Christian (46.2%), followed by atheist (26.9%). Eight participants (30.8%) identified as disabled. Using data gathered for Study 1, participants experienced their most serious event at around 18.23 years old (*SD* = 13.85), with an average of 16.81 years (*SD* = 15.44) since the event occurred. Twenty participants (76.9%) experienced at least one interpersonal event, and the sample reported an average of 4.38 different types (*SD* = 2.45) of event in their lifetimes. A majority of the sample (92.3%) scored 1 and above on the PTGI-SF measure, indicating growth.

The interview sample were found to be largely representative of the participants in Study 1. Inspection of demographic mean differences using chi-squares for categorical demographic variables (e.g. gender) and independent samples t-tests for continuous variables (e.g. age) with a corrected alpha of $p = .007$ (.05/7) for seven simultaneous comparisons revealed that the 26 interview participants did not significantly differ to those who were not interviewed (all $p > .05$). In addition, interviewees did not differ on demographic characteristics compared to those that did not participate (all $p > .05$).

[24] Of the 46 participants who did not attend interviews, seven (15.2%) disclosed that they did not wish to talk about their experiences and completed the questionnaires only. Two (4.4%) participants consented to interviews but these could not be arranged, and a further 37 (78.2%) participants did not respond to invitations for interview but still completed the quantitative measures for Time 2 data collection in Study 4.

Additional chi-squares and independent samples t-tests (adjusted alpha p = .007 for seven comparisons) also revealed no significant differences on key Study 1b variables (event type, frequency of events, coping styles, social support or PTG) between those who were and were not interviewed but completed questionnaires, and those who did not participate altogether (all p > .05). However, interview participants reported significantly more hyperarousal symptoms (M = 4.27) than the 47 participants who completed questionnaires only (M = 2.96), [t (71) = 2.88, p = .005, d = .68]. Table 9 displays participants' experiences of adverse events.

Table 9. *Characteristics and adverse event history of interview participants (N = 26).*

PPT number	Age	Gender	Adverse event history[25]
1	25	F	Serious illness, parental neglect
2	25	F	Natural disaster, attempted rape, physical assault, bereavement
3	24	F	Vehicle accident, serious illness, bereavement, witnessed event
4	57	M	Physical assault, threats by others, military conflict, terrorism
5	43	F	Vehicle accident, CSA, IPV, physical assault, serious illness, bereavement, neglect, witnessed event
6	26	M	CSA, vehicle accident, bereavement, neglect, occupational event
7	35	F	Witnessed vehicle accident, terrorism
8	28	F	Vehicle accident, natural disaster, bereavement
9	23	F	Sexual assaults, bereavement, neglect
10	44	F	Stalking, IPV, rape, imprisonment, bereavement, neglect
11	36	M	CSA, IPV, physical assault, rape
12	55	F	CSA, torture, accident, physical assault, natural disaster, rape, imprisonment, neglect, bereavement, witnessed event, occupational event, other event
13	26	F	Psychotic episodes, neglect, emotional abuse
14	41	F	CSA, rape, parental neglect, physical assault, bereavement
15	38	F	CSA, sexual assault, IPV, physical assault, rape, neglect, witnessed event, other event
16	21	M	Disappearance of family member, physical assault
17	25	M	Vehicle accident, physical assault, CSA, serious illness, occupational event
18	26	F	Rape, imprisonment
19	35	F	CSA, rape, imprisonment
20	58	M	Serious illness, military conflict
21	23	F	Child physical abuse, child psychological abuse, rape
22	33	M	CSA, neglect
23	38	F	IPV, rape, CSA, imprisonment, other event
24	52	M	IPV, homelessness, imprisonment, witnessed event
25	31	M	CSA, military conflict, natural disaster, rape, neglect, witnessed event, other event
26	61	F	Child physical abuse, sexual assault, death of client, IPV, physical assault, serious illness

Note. PPT = participant; F = female; M = male; CSA = child sexual abuse; IPV = intimate partner violence.

[25] *Adverse event history* refers to responses gathered using the PDS (Foa et al., 1997) measure in Study 1 and Study 2, and any additional events referenced during the interviews.

6.3.2. Measures

Posttraumatic Growth Interview Schedule (PTG Interview Schedule). The study required the construction of a semi-structured interview schedule (see Appendix VII) to explore processes and perceptions of PTG. Open-ended questions were asked so as not to confine or prime participant's responses. Questions focused on defining the nature of growth, exploring participant's history of adverse events, the process and outcomes of PTG. Supplementary questions were asked for clarification, depending on the participant's responses. At the end of the interview schedule, participants were offered the opportunity to raise other additional ideas or themes not captured in main interview.

6.3.3. Procedure

6.3.3.1. Data collection

During the recruitment phase, Study 1 participants who consented to be re-contacted were invited to attend an interview to discuss their experiences of growth.[26] Following mutually convenient arrangements, 18 participants (69.2%) attended for face-to-face interviews in a private room on the university campus. The remaining interviews were conducted through video calling software Skype (23.1%) or by telephone (7.7%) due to participants being unable to attend in-person. In total, 26 participants were interviewed, which is a larger number compared to other qualitative PTG studies (e.g. *N* = 14, Shakespeare-Finch et al., 2013), however, the researcher wanted to give all participants who volunteered a chance to take part. To assess for any demographic and Study 1 psychosocial (e.g. active coping, PTS symptoms) differences between participants according to their choice of interview medium (face-to-face, Skype or telephone), one-way analysis of variance (ANOVA) and chi-square analyses were conducted for continuous and categorical variables, respectively. They revealed that

[26] They were also invited to complete the PDS (Foa et al., 1997) and PTGI-SF (Cann et al., 2010) for Study 4.

participants did not differ on any demographic or psychosocial characteristics by their choice of interview medium (all $p > .05$).

Prior to interview, the researcher recalled the scope of the study and invited the participant to consider if they had any questions or concerns about their role. It was stressed that the participant did not have to answer any particular question and they could terminate the interview at any time without penalty.[27] Participants were given an information sheet which detailed the aims of the study and issues of consent, withdrawal and limits to confidentiality (see Appendix VII for materials). The PTG Interview Schedule was administered, with interviews lasting between 13 and 66 minutes (M = 30.39; SD = 13.71). Interviews were audio-recorded for the purposes of transcription, with participant permission, before the audio-recording was destroyed. Participants had up to one week to withdraw their comments after the interview should they choose to retract all or part of their testimony.[28] If they made any statements regarding a risk of harm to themselves or others, this information would be shared with the appropriate professionals. A £10 Amazon voucher was given to participants who attended the interviews as compensation for their time. Permission for the study was granted by the PSYSOC ethics committee at the University of Central Lancashire (see Appendix VII), and was carried out according to recognised BPS guidelines (2009).

6.3.3.2. Data analysis

In this study, thematic analysis (Braun & Clarke, 2006) was used to analyse the interview data as the processes and outcomes associated with PTG are generally unknown. In accordance with thematic analysis principles (Braun & Clarke, 2006), the researcher began by familiarising themselves with the data by reading and re-reading transcripts. Initial codes were then generated based on features within the transcripts that were grouped based on a specific code. Once the data had been collated, the codes

[27] No participant declined to answer any of the interview questions or ended the interview prematurely.
[28] No participant withdrew comments or their entire data within the week after testing.

were categorised into broader, overarching themes with appropriate sub-themes. The themes were then reviewed, such that large and diverse themes were refined and smaller themes collapsed together. The themes were then assessed for coherence in the context of the wider data set and to identify other potential themes that may have been missed from the initial coding process.

To satisfy concerns over the reliability of qualitative analysis (see Chapter 4, section 4.3.), Guba (1981) established four criteria that qualitative methods should address to improve the 'trustworthiness' of the findings. First, the researcher should establish *credibility* by adopting a well-recognised research method to analyse the data. Thematic analysis is a widely used interpretive approach in the PTG (e.g. Mapham & Hefferon, 2012; Shakespeare-Finch, Martinek, Tedeschi, & Calhoun, 2013; Woodward & Joseph, 2003) and wider psychological literature (Braun & Clarke, 2006) that aims to identify patterns in the data relevant to the objectives of the study. While similar qualitative approaches such as grounded theory and interpretative phenomenological analysis were considered, thematic analysis offers greater flexibility as it is not tied to any specific theoretical frameworks (Braun & Clarke, 2006). This was also in-keeping with the desire of the thesis to maintain a flexible approach that was driven by both theory *and* data. Furthermore, the sample size exceeded the very small numbers required of IPA (Riley et al., 2012), thus warranting thematic analysis.

Second, Guba's (1981) notion of *transferability* refers to the generalisability of the findings. True generalisability is impossible given the specific contexts in which data is obtained (Shenton, 2004), and so clear details of the sampling method and data collection procedures were provided in the method (see section 6.3.3.1.). Third, the *replicability* of the findings should be considered (Guba, 1981). In qualitative research, the changing nature of the phenomenon studied may mean that results may not be replicated easily (Shenton, 2004). To address replicability more directly, the procedures have been clearly defined in the method, data analysis provided (see section 6.4.), and limitations noted (see section 6.5.3.) to allow for future replication and independent

scrutiny. Finally, steps should be taken to ensure the views of the participants are heard, rather than those of the researcher (Guba, 1981). Therefore, quotes from all participants would be presented, including those that deviated from the final themes, as one way to improve *trustworthiness* (Cousin, 2009).

Additionally, steps were taken to ensure the reliability of the qualitative findings. When evaluating themes from semi-structured interviews, discussions took place with a member of the researcher's supervisory team to identify areas of agreement and disagreement. While there is no specific method advanced to enhance rigour in semi-structured interviewing, this study follows recommendations by Campbell, Quincy, Osserman and Pedersen (2013), who proposed steps for establishing reliability and agreement among coders. They identified two issues that should be addressed to demonstrate reliability: *unitisation* and *discriminant capability*. First, *unitisation* refers to the extent to which coders identify specific 'units' or segments of text to be coded prior to analysis (Campbell et al., 2013). If not addressed, it is difficult to determine whether the coders have coded in the same way. In cases of exploratory research, of which the current study is an example, *units of meaning* were assigned by highlighting areas that were codable, regardless of length, by the researcher. Both the researcher and the team member then coded these areas independently on five (19.2%) of the 26 transcripts, and then discussed areas of discrepancy. Following this, the remainder of the transcripts were read by the same team member, who was experienced in thematic analysis, to identify additional themes of interest which were then discussed with the researcher.[29]

Second, *discriminant capability* refers to how well coders can unambiguously categorise text into themes (Campbell et al., 2013). This can be resolved through negotiated agreements with other coders and a proportion agreement calculated. Proportion agreements are advantageous in situations with multiple themes (thus reducing chance agreements) and there is no intent to generate variables for use in

[29] Following discussion with the research team member, the 'event centrality' theme was included.

statistical analysis (Campbell et al., 2013). In the current study, the proportion agreement between the researcher and the supervisory team member was 84.2%, with values above 70% regarded as excellent indicators of reliability (Kurasaki, 2000).

6.4. Results

Three broad themes relating to *experiences of adversity*, *processing adversity* and *outcomes of adversity* (with subthemes) emerged from the analysis. Figure 6 presents a summary of the coding themes before these are discussed in detail.

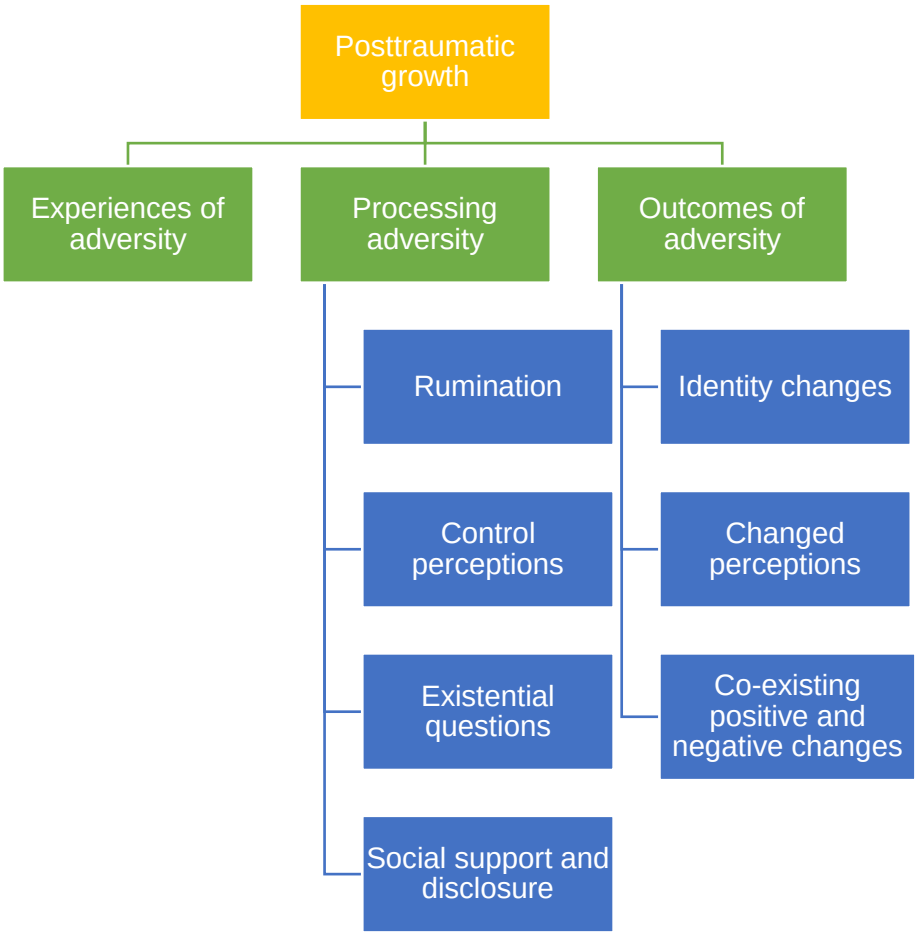

Figure 6. Emergent themes (green) and subthemes (blue) from semi-structured interviews.

6.4.1. Experiences of adversity

Experiences of adversity is concerned with the characteristics of the events that participants described. Participants in the study experienced a diverse range of adverse events, in which almost all acknowledged the significance of their early life experiences. Seven participants related details of neglect, physical and sexual abuse in childhood. The below quotes come from a male who experienced a violent same-sex relationship in adulthood (Participant 11), and a female who self-reported a diagnosis of PTSD (Participant 15), respectively:

> *I was abused from day one. My mother forced me to dress as a girl… emotionally abused me for years. During this time, I was sexually abused by my brother… rape and everything. He was physically violent towards me as well. (Participant 11)*

> *I was stuck in a forest fire and was in a building that got struck by lightning. I nearly died in an accident where I was caught between a double-decker bus and a barricade. I was almost squashed but managed to free my legs. I've also had a couple of experiences with sexual assault by my mother, and had gotten out of an abusive domestic relationship. (Participant 15)*

It was clear that the childhood experiences of some of these participants were characterised by multiple and wide-ranging adverse events. However, adversity was not purely confined to childhood. Like participant 15, nine other interviewees who reported childhood adverse events also continued to experience a high frequency of events into adulthood. While all participants had some direct experience of adverse events, there was also a degree of indirect exposure reported by participants. Events experienced indirectly included witnessing vehicle accidents, hearing of the death of a client, or significant terrorist atrocities reported in the media.

There was some discrepancy as to how participants viewed their multiple and diverse experiences. Ten participants stated that their prior adversity had a significant influence on their perception of subsequent stressors. This female participant (Participant 5) noted how her own experience of child sexual abuse had shaped the interpretation of her daughter's recent suicide attempt:

> *I walked into the hospital and I was actually on shift when I got the call. So when I arrived, I saw my daughter in an absolute mess, and I just dealt with it straight away. I didn't go to pieces – and I think dealing with all the other stuff in my life has made me more able to deal with other things that come my way. (Participant 5)*

Participant 5 felt they were emotionally prepared to deal with subsequent adverse events as their prior experiences had provided them with the psychological resources to manage the situation. In contrast, five other participants appeared less motivated to draw upon their previous experiences:

> *It's not like it doesn't bring up more traumatic symptoms for me and things like that, but it's just that I've had so many things happen, that there just comes a point where... something clicks off in your head and you can't process any more. You have no desire to fathom it. (Participant 15)*

Participant 15 appeared to be overwhelmed by their prior experiences and so they were less able to deal with future events. Individuals who reported similar experiences had seemingly given up attempts to rebuild any beliefs they previously held about themselves or the world before the adversity. Interviewees who held this view felt the nature of their experiences had influenced their PTG:

> *I would say my growth has been severely stilted. I think to grow up as you would expect a "normal" person to grow up, you expect people to by 30 to have a nice secure job, family life. I've grown up with abuse from day one, and abuse for the past 35 years of my life. It's hard to actually be grown up. (Participant 11)*

For Participant 11, the protracted nature of their adverse experiences across their lifetime had inhibited their ability to experience any growth.

6.4.2. Processing adversity

The *processing adversity* theme considers the period of cognitive and emotional processing that ensues after the adverse experience. It reveals participants' attempts to understand the impact of events. Four subthemes are described, which relate to rumination, control perceptions, existential questions and social support.

6.4.2.1. Rumination

The rumination subtheme relates to participants' focus on thoughts about aspects of their adverse experiences. Two predominant yet contrasting views emerged: first, the idea that ruminating about events inhibited the development of PTG and second, rumination was helpful to processing the adverse events, and in turn was conducive to PTG. The first prevailing view held by nine participants was that rumination was potentially harmful to the PTG journey. Intrusive thoughts were commonly reported. The below male participant (Participant 16) described the effects of injuries sustained in a mugging whilst jogging one evening:

> *I had the visual impact – the scars. Every time I looked at my knees it was one of those things that would remind me of it and it took a while, especially for the first six months. They were red the entire time and I would catch them and it would always trigger things in me. (Participant 16)*

Memories of the mugging would resurface due to the visual reminder of the initial incident. Symptoms in some individuals were severe enough to warrant a diagnosis of PTSD, as reported by 10 participants. Interviewees also related that dwelling on events fuelled negative symptoms such as low self-belief years after the event:

> *I think barriers are negative feelings. So, if I think about what stopped me growing initially, it would have been feelings of resentment going around my head. It would have been feelings of resentment, feeling bitter, being in denial about things happening. I think they were my barriers to growth, and I think they were the things you have to overcome in order to grow. (Participant 8)*

Participant 8 described how circular thought processes were barriers to her growth process. For some participants, aspects of their experiences would replay in their minds and interfere with everyday social and occupational functioning which would be difficult to control. Participant 17 also noted how their ruminative style would lead to challenges managing intense emotional states.

Four participants commented on strategies used to mitigate the effects of this intrusive type of rumination and instead aid their growth. These statements were

observed in participants who had some difficulty reconciling their experiences with their world views:

> *I always try to think positive. Even if there is 70% negative in my life, I always try to think positive, the crucial thing which is... I feel that being optimistic about events is better than always dwelling on them. I try to stay on the positive side, and I think that's why that is. (Participant 16)*

This young male participant (Participant 16) described how he used optimism to counter the distressing aspects of his experiences. Optimism and denial appeared to be significant strategies for some participants as either disposition avoided dwelling on the distressing aspects of their experiences. Others, such as Participant 2, felt they had to distance themselves from their emotions:

> *I would say I have experienced growth. I tended to cope logically, rather than emotionally with situations. I thought it was a good thing because you don't get excessively upset or breakdown over things. I didn't want to be in a place again where I was so shattered that I couldn't function. (Participant 2)*

Early attempts to disengage from aspects of the event were felt to aid this participant's PTG at a later stage. Two other participants framed avoidant and emotional numbing strategies as an adaptive response to deal with unpleasant memories of the adverse events.

The second cognitive processing subtheme was that rumination can aid positive adjustment from adverse events. Adverse experiences had disrupted or violated existing world beliefs, and there was a process to incorporate the events within existing world views to find some sense of meaning. Fifteen participants commented on deliberate attempts to contemplate their experiences:

> *Just having the processing space was good in itself. It's really helped having time to focus on the things and thought patterns that keep me stuck, and stunt my growth. I always used to be stuck in the past, from a young age, thinking about things that I'd said or done that were bad or embarrassing or hurt someone and obsessing over those, without looking to the future. (Participant 13)*

Intentional and purposeful thoughts about the event, as described by Participant 13 with psychotic episodes, afforded the opportunity to understand the impact their experiences

had upon themselves. These thoughts were driven by the individual rather than the adverse event, which helped them to make sense of their experience and facilitate the process of PTG. Deliberate thoughts were brought about by attempts to find some meaning in events that were otherwise inexplicable:

> *Talking about the attack, I suppose life is full of uncertainties, so if I have the full facts I feel better. It makes me feel safer… I understand what's going on for me, for other people in the world. I suppose things have happened previously, you question why does that happen? What is that about? Why am I here? It's hard. (Participant 7)*

Participant 7 was caught in a terrorist attack in 1993 and attempts to find meaning were somewhat protracted and unresolved for over two decades. This was quite a lengthy process for some individuals, and some had still not reached a satisfactory interpretation years after the event. For five participants, there was unease that uncovering the reasons behind their experiences could reignite previously suppressed feelings. Participant 13 weighed up the costs and benefits of finding meaning:

> *I think it would be scary to remember what happened because it would make those dark feelings resurface, possibly, but not knowing is equally disconcerting, because it means I feel I can't move on, because I don't know what happened. (Participant 13)*

Participant 13 acknowledged that deliberate attempts to understand the event were not a solely positive experience. However, two participants described their attempts to actively avoid contemplating the meaning behind their experiences as a “strength” for them. For the majority of others, the meaning making process was necessary, even if it was distressing. Most statements reflected that gaining an understanding of their adversity was beneficial for PTG:

> *For me, the number one aspect from trying to understand it all was the opportunity for learning. I know some people who have had traumatic experiences and I was there for a while too. I focused on the bad and the terrible effects, that I wasn't able to see the light at the end of the tunnel and learn from them. (Participant 14)*

Deliberate attempts to think about the event were a learning process for Participant 14 which enabled them to appraise their situation in a different way and experience PTG. Eighteen interviewees described a number of methods that helped them to process what

had happened. These involved the use of social networking sites, online forums and literature regarding spirituality or involving others who had overcame adversity. Understanding how other people had derived meaning from their personal events enabled several of the participants to do the same in their own cases.

6.4.2.2. Control perceptions

The control perceptions subtheme reflects the extent to which the experience of adverse events challenged participant's feelings of control over their recovery and future occurrences. Seventeen participant's endorsed themes of control in their disclosures. Adverse events were widely seen to challenge one's sense of control, although this appeared to vary according to the type of event experienced:

> *I was in a group of soldiers in Zimbabwe that was ambushed, and a number of us were killed. I was one of the three survivors of it, and it came to the point where I would be one of those that was killed or injured in it. That was something I could control to some extent. In the second one where I had cancer when I was in intensive care, I knew I was dying. People talked to me and I could tell I was dying. I had absolutely no control over what had happened to me - it was completely in the hands of other people. Possibly when it wasn't in the hands of other people was when I started to get better. (Participant 20)*

Participant 20 reflected that his control perceptions were increased when he felt he had command over his own recovery, as opposed to natural event or lying in the hands of other people. Increased perceptions of autonomy were thus generally seen as conducive for PTG. Of these, 11 participants stated that greater control over their lives gave them a sense of purpose about the future:

> *I think you start to learn to be an individual, as far as you start to break free from the past. Therefore, you learn to become more optimistic and less pessimistic because you are more in control of your own future, your own life. (Participant 4)*

Participant 4 described how their increased control was also associated with enhanced optimism. For other interviewees, increased control offset perceptions of helplessness and vulnerability. Interestingly, control perceptions for four individuals did not always reflect actual control over the participant's circumstances, although they appeared to sustain growth regardless:

> *I can't have him control my life again, so this is why I'm fighting back. That's why I feel like I've got to reach my targets, my goals of what I want to do before he maybe comes out and I end up going downwards again and be depressed or thoughts like I'm trying to fight to get to a certain level, before going backwards. Hopefully I won't, but it's never really going to go away. It's just like masking it off and brushing it to one side, because it will always be there to some degree. (Participant 23)*

Growth for Participant 23 was viewed as regaining a sense of control over their recovery that had previously been taken away by their partner who perpetrated physical abuse towards them. However, they acknowledged that there was a discrepancy between their perceptions of control and their feeling that the event will "never really go away".

The increased sense of autonomy that came with PTG was not welcomed by all participants. Six survivors felt "very much out of control" as a result of their experiences and remained somewhat uncomfortable years after their adverse experiences:

> *I'm very indecisive when it comes to influencing my circumstances and growth. If someone gives me a choice, it causes unease in myself because I think from childhood I wasn't really given choice. It was like I was told to do something. Sometimes, even if I did it, I was in the wrong anyway. (Participant 25)*

Participant 25 displayed some anxiety over their new-found sense of freedom following adverse events as a child and in the military. Other negative perceptions were observed among three participants, who felt they had become more "selfish" as they were focused on their own PTG at the expense of others.

6.4.2.3. Existential questions

Interviewees explored themes concerning the impact of their adversity upon their existence and religious or spiritual beliefs. For 14 participants, it was felt that a seismic event had increased their awareness of their own mortality:

> *I sit and wonder if I am pessimistic in terms of the future and how things might impact on us. It's made me think about death and all those sort of things. You know, that one day you could be okay and the next day that world, that life you live, could be completely different. (Participant 7)*

Two decades after their exposure to a terrorist attack, the event served as a reminder of Participant 7's own vulnerability and the shortness of time. Four participants additionally

reflected on wider questions of human morality. They felt that their experiences of interpersonal events had encouraged them “do the right things” by not “allowing bad experiences to turn you into a bad person”.

In addition to existential and moral re-orientations, participants commented on how their experiences of adversity had shaped views of religion and spirituality. A trichotomy of views emerged regarding the role of religion, in which participants either reported a loss, enhancement, or absence of beliefs. Participant 4 believed religion to be an impediment to his PTG process:

> *I think religion in my life has been detrimental to my thought process. My father was very dominating and would use religious connotations to beat you up with. I suppose it was useful to lay down values, but I think the power and control that comes from learning those values is a little bit too much to me. I found it quite destructive. (Participant 4)*

Participant 4’s prior negative encounters with religion through his father were detrimental to his PTG. In a similar manner, three participants spoke of a spiritual struggle and “arguments with God”, who, in their view, allowed such events to occur. Seven participants were less tolerant of religious matters, with the faith they once held in a higher deity replaced by “logical thinking”.

While 11 people questioned the role of religion, exposure to adverse events in four cases sparked an interest in a variety of faith or belief systems. Three participants who claimed no previous religious affiliation had subsequently turned to religious or spiritual texts out of curiosity and guidance:

> *It's taken real effort to be optimistic, and it's taken a lot of different looks at different spiritual understandings, because the more ways you look at something in different way, the more chance you have of getting a grasp on it. I've looked at loss from a Christian point of view, from a Buddhist point of view and from a couple of other New Age books. You get an overview of them and think, “Hey, this is bigger than my grief”. (Participant 5)*

For this survivor of sexual abuse (Participant 5), exploring a number of belief systems was part of their growth by allowing them to put their events into a wider perspective. This provided comfort for those who may have questioned their faith during the struggle

after adversity. In addition to religious texts, participation in religious communities was also beneficial for two interviewees who had renewed their “commitment to God”.

However, religion did not play a part in all participant’s accounts of growth. The absence of faith for three participants had increased their own self-efficacy to deal with adverse events without relying on external beliefs:

> *I was never religious anyway. It was the faith in myself, knowing that I could manage this, even if it's a difficult situation, I’d be able to come out of it. I have insight, I have a brain to think and feel, whatever it is... so I’ll be okay. I have more faith in myself now that does help me grow from wherever I am to wherever I want to be. (Participant 3)*

This apparent resiliency was helpful to this Participant 3’s PTG as it provided an increased capacity to manage stressors. Another participant added that his perception of positive changes was not derived from a higher deity but rather the “greater good” within other people, which was important to his recovery.

6.4.2.4. Social support and disclosure

All participants reflected on the significance of social support as part of the process of PTG. Three aspects of social support were commented on by participants: reactions to disclosing adverse events, the benefits and difficulties associated with receiving support, and the extent to which growth in the participants was corroborated by others. Twenty-one interviewees found support offered by friends, family and professionals as helpful to their growth. Participant 13 described her experiences of disclosure in therapy:

> *Therapy really just allowed me space to break down and collapse in a heap, which is what is needed in order to pick oneself up and move on. If you're just constantly trying to trundle along, you're not really dealing with things properly, you're just pushing them aside, whereas I had to face my problems. (Participant 13)*

Participant 13 believed therapy offered her the opportunity to begin to process her recent adverse experiences. The beneficial effects of disclosure afforded by a therapeutic environment were mentioned by eight participants who were currently accessing

psychological treatment. They felt therapies allowed them the necessary time to begin to reassess their experiences in a manner that was “guided and not dictated” by professionals.

Eleven participants reflected on reactions to the disclosure of their experiences. For many, the response of family members, friends and others was critical to their PTG. Participant 24, a male who experienced IPV, described a negative reaction from his family regarding his experience:

> *The family have been absolutely crap. They've doubted me and even though they're quite successful, I've not had a penny or any support really. It’s made things a lot harder than they needed to be. (Participant 24)*

He added that he was also turned away from support organisations serving people who have experienced IPV, and a ‘stigma’ towards male victims had hampered his growth. Among four other participants, there was a sense that close others had reacted insensitively to their suffering or lacked understanding of their struggle. In contrast, positive reactions to disclosure as served to provide comfort and reassurance:

> *It's been surprising really, the people who ended up helping me. It was comforting in a way to be just told, "No, you're not mad, you're just in a difficult situation and you've gotta work through it". (Participant 21)*

Disclosures that had been received positively appeared to aid PTG in six participants. It was noted that the presence and receipt of positive support had encouraged a greater openness on the part of the people who experienced the events to accept help, rather than relying on themselves to deal with the situation alone. For the remainder of participants, there was comfort in simply knowing that their social network was present if needed. However, six participants had difficulty accessing any support in the first instance. Participant 19, who experienced childhood sexual abuse, acknowledged this struggle nearly three decades after her experiences:

> *I can't accept help for the problems that I face, so this is a big barrier for me. I mean I've spoken to my GP about it and he wanted to send me for CBT, wanted to send me to a psychotherapist, wanted me to do all of these things and I can't engage with that. He wanted to put me on anti-depressants and I can't take them.*

It's like something's stopping me from getting the help that I probably need. (Participant 19)

For Participant 19, the barriers to accessing social support were related to reliance on avoidance coping and emotional numbing, which she felt prevented her from reporting any significant positive changes. Yet, difficulty accessing support was not necessarily perceived negatively. Interestingly, one participant commented that not accessing social support had only increased their feelings of autonomy, achievement and self-reliance.

Eight participants also commented on the extent to which their growth was corroborated by others. They acknowledged that their family had noticed changes within themselves, such as increasing isolation or maturity. Among five other interviewees, an interesting divergence in views of the self and others emerged:

Some people in my family would probably say that I'm negative and pessimistic. But, others say I'm the most positive person that they know. At work, they say I'm too optimistic and idealistic, but I don't agree. I am just someone who believes in ideals and we've got to try our best and not get down. (Participant 14)

This adult female (Participant 14) who presented with prolonged childhood sexual abuse noted how her perceptions of PTG differed among those around her.

6.4.3. Outcomes of adversity

The final theme of *outcomes of adversity* describes participant's experiences of their new-found PTG. Three subthemes were identified during this phase: identity changes, co-existing positive and negative changes, and changed perspectives.

6.4.3.1. Identity changes

Thirteen participants commented on how their adverse experiences had partly or fully became part of their identity and 'life story'. There was a sense among these interviewees that they were a shadow of their former self prior to the event, and attempts were made to redefine themselves:

I am in the process of becoming a new person, the person I would have been had I raised myself. A person who is not the result of my parents' weaknesses

> *and abuse, but who is quite the opposite. Strong, disciplined, caring and determined to make positive change happen to myself and the world around me. It motivates me to try and become the opposite of my parents and I see this also not only as my ultimate rebirth but also my revenge in a way. This way their power over me will one day be gone entirely and they will be nothing but a fact from the past. (Participant 14)*

Participant 14 noted that her memories of childhood abuse proved a turning point in her life. However, it was also apparent that the experiences with her parents served to become a reference point for her PTG; attempts were made to distance herself from that of her parents. Similar views were echoed in six other interviews where survivors had appeared to frame their future actions around their adverse experiences.

Among the survivors whose adversity was central to their identity, participants described attempts to "re-invent" themselves. They tended to separate their life now from that what had existed prior to the events:

> *It was a way of cutting ties with the past, cause obviously every time I heard that name, I would think of all the abuse he suffered. I think in a way, I did go to the extreme and change my name to correct my identity to help heal. In a way I did get that disconnection that worked for a while, but because I didn't deal with the crap, obviously it doesn't work for that long. (Participant 11)*

The experiences of Participant 11 were so embedded within their personality that they took steps to create a new identity for themselves as part of their PTG. Other interviewees were keen to point out they should not be defined by their symptoms or past experiences:

> *I lived in a mobile home, I just filed for bankruptcy, you know, my husband had walked out and left me with a mountain of debt. This was almost 30 years ago actually. It was essentially that I had poor functioning and now I've grown. Through that whole process I had PTSD, and so I think I am an example that PTSD doesn't have to define me. (Participant 26)*

Participant 26 linked their ability to overcome adverse experiences as a motivation for their growth which was thus central to their identity. Although the participant's disclosure endorsed some centrality, they were keen to point out that they should not be defined by their experiences. Meanwhile, another five participants felt that their experiences had negatively impacted on their own capacity to perceive any sense of identity:

> *There's identity barriers because I don't know who I am. No-one can actually tell you who you are. If I had a good upbringing back then, I might have some sense of who I am, but because I didn't have that, I have no sense of who I am. I just don't feel a part of anything at all. (Participant 12)*

Participant 12 felt that their sense of self had become somewhat subsumed by their adverse experiences. Other participants remarked that their life direction and purpose had changed or had become virtually non-existent, following the "disruptive" nature of their adverse experiences.

6.4.3.2. Changed perspectives

Twenty participants remarked at how adverse experiences had altered the way they perceived themselves and those around them. Adopting a new perspective was universally regarded as beneficial for the participants in this study as part of their PTG:

> *Something definitely feels different in so far as I don't feel beholden to seeing the world in a particular way. I tended to feel bias towards 'expecting', or preparing for unfavourable outcomes in day to day life; expecting unpleasant or very difficult things to happen. But my perspective has changed and I can assure myself there is nothing - usually, to suggest I need expect a negative outcome, and it now rarely inhibits me or causes me to choose another course of action. (Participant 22)*

Participant 22 with a history of childhood neglect remarked that they previously viewed life through a prism of unfavourable expectations about future events. However, PTG had enabled them to feel less anxious about adopting particular behaviours through a perceived fear of negative consequences. Participant 12, who was accessing support through a therapist, felt that they were no longer responsible for the adversity they had experienced, which gave them a more "positive outlook for the rest of my life". Attempts to move forward were similarly echoed by 11 interviewees whose changed perspectives were a necessary part of their PTG journey which allowed them to evaluate the positive and negative aspects of their experiences.

Nine participants noted that experiencing adverse events had led relationships to be perceived in a different light. There was a sense that having additional perspectives from other people facilitated greater empathy and understanding with others:

> *When I see people being stubborn and things like that, I give them a bit of space, because they're going to lock horns with you. I'm gonna wait for them to have a different view on things. It's given me patience, because I let them look at it a different way. If I can change things or see things from a different point of view, I can let them heal - and they can understand it too, so I have faith in other people. It does make you more at ease with your own issues if you can put another perspective on it. (Participant 5)*

Participant 5, who was sexually abused as a child, believed that through a greater understanding of oneself, they had more tolerance for opposing views. This sentiment was echoed by three other participants who felt their adverse experiences had made them less selfish and more appreciative of others. Exposure to other perspectives was also associated with positive character traits, such as patience and open-mindedness.

Eight participants felt that experiencing multiple events had enhanced their ability to develop new points of view:

> *Because I've experienced multiple events it's almost been easier. I realise it's just part of life and you can do what you want with it. I think if it had just been one event, I could have got stuck on it. I do know some people and they're like, "Oh, that one thing... it'll define myself for the rest of my life then". So the fact that I've gone through multiple experiences has helped me have more perspective. (Participant 14)*

Participant 14 believed that her acceptance of adversity as a life experience had helped her to perceive positive changes in dealing with future events. In this sense, participants who reported an acceptance of the situation were able to accommodate the uncertainty that adversity can create. Indeed, four others who experienced multiple exposures to adverse events commented that being able to look at different perspectives was potentially adaptive. For example, considering alternative ways to manage challenging events in childhood was a “survival tool”, whereas it now served a “useful” purpose to deal with subsequent events.

However, not all participant’s perspectives were significantly altered by an adverse event. Five participants spoke of PTG as a general movement towards self-improvement, rather than being triggered by a specific stressor:

> *I guess it's more about internally, about accepting me as the person that I am. I used to imagine that I could do a lot of things and thinking everything was easy when it wasn't. When I realised that, I found it really hard to accept because I was not the person I thought I was. So, thinking where I can improve is growth for me. (Participant 1)*

Participant 1, who experienced childhood neglect, construed PTG as valuing their own character strengths and weaknesses, reflecting a more general interpretation of personal growth. In some cases, pre-adverse event views of the world remained relatively unchanged:

> *I don't trust anybody, even the people I love. That sounds like a total contradiction! I maintain the expectation that the world is a really really dangerous place and I will get hurt if I'm not vigilant. (Participant 26)*

Participant 26, who experienced multiple adversities in childhood, maintained similar world views, which had remained tainted since their childhood experiences.

6.4.3.3. Co-existing positive and negative changes

All participants reported a range of co-occurring positive and negative changes since their adverse events. In terms of positive changes, relationships with friends and family had improved and there was an increased demonstration of creativity, compassion, forgiveness, gratitude, humility, openness and tolerance:

> *Learning to be able to express and assert myself interpersonally has been a bit of a challenge as an adult. It feels like an ongoing piece of work. I suspect something of this has been significant in my episodes of physical and mental illness on the negative side, and on the positive, I strangely believe it has helped me develop some skills in empathy, listening and attending that have guided and shaped me professionally. (Participant 22)*

Interestingly, six participants felt that having less trust in people was "strangely positive" as it could protect them from future harm. In addition to psychological changes, five participants described improvements in their physical health, including increased energy, frequent exercise and fewer medical aliments.

However, not all PTG changes were a positive experience. Nineteen participants reported residual negative symptoms as a direct result of their adversity. Notably, 11 of these participants reported ambivalence towards significant life events:

> *I feel like I have achieved things, but I don't think I really value my achievements. I don't really value being a nurse or a midwife as a great achievement. I don't see my marriage - I've been married for sixteen years and had five children - I don't really see any of that as an achievement. I'm sort of ambivalent and have no particular feeling towards it all. (Participant 19)*

Participant 19, who experienced familial sexual abuse, was ambivalent towards significant events in her life and presented as emotionally 'flat' during the interview. This apathy was also observed by four participants who approached situations in "neutral" or "black and white" ways, seemingly without any emotion. Among these interviews however, there was a sense of continued anxiety and suspiciousness towards others:

> *I used to be quite a sociable person, I'm not sociable now. I'm not as willing to put myself out there, so it takes me a long time to build up trust with people. I'm not myself with people, I have a wall with friendships and things like that. But, I've realised how important they are to me now. In terms of professional growth, I found that easier because I'm able to separate that out from myself in that I am able to acquire skills and develop them. My confidence has grown in that respect. (Participant 18)*

Participant 18, who experienced rape and imprisonment, described conflicting positive and negative changes in different areas of their life. Similar sentiments were reflected by 22 other participants who reflected on their experiences of a mixture of positive and negative changes in the struggle after adversity. Ten of these participants found it easier to engage in educational and occupational work as a way of coping with their personal experiences:

> *I think that I do have issues in some ways that I deal with stuff, but learning how to work around it has been amazing. Trying to tailor a career that I can do so I can work in and around my symptoms that feels less like something that I have to fight with in juxtaposition to the world and something that's just who I am. I can do that so I am employable and functional so that's good. (Participant 15)*

Participant 15 noted that being employed allowed them to separate their personal struggles from their professional duties. Another participant felt that keeping busy

provided a distraction, rather than “dealing with the demons”. Others noted that “giving something back” to people had helped themselves to perceive PTG. However, some adverse experiences were overwhelming for two participants who felt they had not experienced any growth:

> *Obviously if you are told things and have things done to you, you start to believe them, so your personal growth becomes stilted. If you're not able to have the emotional outlet, or release or anything… I did try and express myself - I did try, but it didn't work as the family kept on trying to be perfect. I was the black sheep. I think that way it was bloody hard! I wouldn’t say I've grown at all. (Participant 11)*

Participant 11 described limited opportunities to express feelings about his experiences which in turn inhibited their PTG.

6.5. Discussion

This exploratory qualitative study was the first to add greater depth and understanding to the process of PTG among a sample of people exposed to diverse and multiple adverse events. Two areas of interest were explored in greater detail in line with the overall thesis research questions: (1) individual differences in the perceptions of positive and negative changes following adversity; and (2) identifying factors that can prevent or facilitate PTG. Three prevalent themes (*experiences of adversity, processing adversity and outcomes of adversity*) emerged from the interviews that represented different aspects of the emotional struggle and growth after adverse experiences.

6.5.1. Perceptions of positive and negative changes

People reported a wide range of positive and negative changes as part of their growth, thus revealing that PTG is not a solely positive phenomenon. The three themes naturally followed clinical interpretations of adjustment following adversity, in which people seek safety, process event-related information and reconnect with others in meaningful ways (Herman, 1992). This is not to imply a strictly linear PTG process; rather, the PTG process appears to be a complex interplay of positive and negative changes, thus confirming that growth and distress are not mutually exclusive concepts,

supporting arguments within existing PTG models (Joseph et al., 2012; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). However, the study highlighted a greater need for more holistic investigations of PTG processes and outcomes that consider both positive *and* negative changes in psychological functioning, as opposed to focusing on positive changes only (e.g. Woodward & Joseph, 2003).

Study 2 not only identified a range of changes but provided greater insight into how survivors perceived their transformations, for better or worse. To further add to the complexity of the PTG process, changes could be perceived very differently among individuals. For example, greater trust in relationships was positive for some people, while a lack of trust was also viewed positively by others as it served a protective function. This may point to different aspects of growth, such that some changes (i.e. a lack of trust) are seen a defensive response to stress (Boerner, Joseph, & Regel, 2017) and others (i.e. greater trust, corroboration from others) reflect tangible positive change, as outlined in the JFM (Zoellner & Maercker, 2006). Taken together, the variability observed in people's experiences highlights the individualised and inherently subjective nature of the growth process that cannot be fully comprehended in solely quantitative research designs.

In contrast to existing qualitative literature (Guse & Hudson, 2014; Vanhooren et al., 2017; Woodward & Joseph, 2003), the study also included survivors who felt they had not grown at all. These people did not report any personal benefit from their adverse experiences nor could they find meaning in events. It is possible that the adversity itself has overwhelmed the psychological resources of the survivor (Butler et al., 2005), which inhibited any potential for PTG. Conversely, the event may not have been 'seismic' enough to a person's assumptive world (Tedeschi, 1999), therefore negating the need for growth. Although PTG appears to be a near-universal outcome, the present investigation draws attention to the fact that not everyone can experience growth.

6.5.2. Barriers and facilitators of posttraumatic growth

Study 2 qualitatively explored factors that can promote or inhibit PTG among people exposed to multiple adverse events. Existing qualitative research (Hussain & Bhushan, 2013; Shakespeare-Finch et al., 2013) tends to focus on the nature and characteristics of positive changes, rather than identifying factors that can promote or inhibit growth. Positive changes were reported regardless of the number of types of event, or the type of events experienced, supporting the results of Study 1 and models of PTG that emphasise subjective appraisals over the objective characteristics of the event (Joseph et al., 2012; Tedeschi & Calhoun, 2004). However, the current study uniquely observed that the growth process could be influenced by childhood adversity. While negative early life experiences were central to most people's experiences of change, some participants appeared to struggle with their lingering symptoms, whilst others used them as a vehicle for PTG. Childhood adversity has been associated with an 'enduring cognitive vulnerability' (Bak et al., 2005, p. 364) in which many survivors report long-term difficulties in managing emotions and poor control perceptions. For others, frequent exposures in childhood can lead to a greater sense of 'toughening' and preparedness to deal with future events (Dienstbier, 1989; Janoff-Bulman, 2004). This may be due to a 'dose-response' which implies a link between the magnitude of the event and subsequent adaptation. Therefore, individual differences in the way people process multiple types of adverse events may determine whether growth is experienced as an outcome.

The interviews revealed some individual differences in factors responsible for people's perceptions of growth, drawing greater attention to the complex processes that underpin experiences of PTG. Interviewees reported how their growth was affected by reactions from close others, societal attitudes, and the role of religion in their lives. These findings suggest that the wider social context in which individuals operate is particularly relevant to PTG development. This provides an additional perspective to understand growth processes, in which the vast majority of existing research is concerned with

individual (rather than contextual) characteristics that may lead to more or less PTG (e.g. Affleck & Tennen, 1996; Helgeson, Reynolds, & Tomich, 2006; Linley & Joseph, 2004; Prati & Pietrantoni, 2009), while extant theories (Joseph et al., 2012; Tedeschi & Calhoun, 2004) poorly describe socio-cultural factors. However, the qualitative findings compliment equally limited quantitative results in PTS literature, which report that reactions to disclosures (Ullman & Peter-Hagene, 2014), the family environment (Dekel & Monson, 2010), societal stigma (Zou et al., 2009) and social religious contexts (Walker et al., 2009) can determine negative psychological changes. Therefore, it seems that while the social context can place individuals at great vulnerability, it can also serve as a catalyst for PTG development.

Perhaps the most revealing aspect of the study was the exploration of cognitive processing involved in PTG development. The subtheme revealed that the type of rumination was particularly significant to the growth process. Survivors described event-specific intrusive thoughts that brought back reminders of their experiences, as well as more deliberate attempts to find meaning. Both forms of rumination have been implicated in the FDM and ACPM models (Joseph et al., 2012; Tedeschi & Calhoun, 2004), but until now have not been explored in depth within qualitative studies. Survivors who dwelled on aspects of their experiences in a cyclic or obsessive fashion reported more distress than individuals who engaged in direct attempts to understand events. This finding is consistent with quantitative research (Cann et al., 2010; Morris & Shakespeare-Finch, 2011; Stockton et al., 2011; Triplett et al., 2012), which distinguishes between automatic and passive forms of cognitive processing, and more intentional, reflective attempts to find meaning and revise life narratives (see Chapter 7 for discussion and further exploration in Study 3).

In addition to rumination, perceptions of control were significant to people in this study. Adverse events can pose great challenges to people's feelings of control over their lives (Frazier et al., 2011), which was reflected in the Study 2 interview disclosures. However, Study 2 also indicated that those who overcame frequent adversity also

reported more control over their present situation, and future ability to deal with events, that helped them to experience PTG. The growth literature agrees that positive changes are often accompanied by increased mastery and autonomy in one's environment (Joseph et al., 2012; Woodward & Joseph, 2003), which may be emboldened following multiple or prolonged events (Shigemoto & Poyrazli, 2013). Therefore, people who feel they have overcome numerous brushes with adversity are more likely to report greater control over their present situation and ability to process future events. Interestingly, control perceptions were not always found to correspond to actual control. Some people in the study described attempts to regain control in otherwise objectively challenging circumstances. Early research has found that individuals with severe adversity who report high control are also more distressed (Affleck, Tennen, Pfeiffer, & Fifield, 1987), suggesting that control perceptions may have an illusory quality. At the same time, literature also indicates that people who overcome adverse events may have exaggerated feelings of control (Taylor et al., 2000, explored further in Study 4b). Therefore, even though some control perceptions may not be realistic, they could still be adaptive in that they lead to enhanced PTG.

A final aspect of the PTG transformation related to the degree to which people spoke of their experiences as being a core component of their identity. The relationship between adverse events and identity has been discussed in recent literature (Berntsen & Rubin, 2007; Boals, Steward, & Schuettler, 2010; Fitzgerald, Berntsen, & Broadbridge, 2016), which has been associated with both positive and negative changes. It is possible that excessive cognitive focus on the event could lead to the event becoming more centralised, although this would require further empirical testing. Nevertheless, this was the first PTG study to qualitatively reveal the extent to which adverse events become ingrained into a survivor's identity. The findings build on prior interview research (Kuenemund et al., 2016) that acknowledges centrality, although the aforementioned study did not fully explore this aspect of positive transformation in depth. While the present study provided some insight into how identity perceptions manifest themselves

in people exposed to adversity, the process by which adverse experiences shape perceptions of identity and subsequent adjustment is still unclear.

6.5.3. Strengths and limitations

The limitations of this study are primarily confined to the qualitative methodology used. The coding, identification and organisation of themes may be susceptible to inherent bias of the researcher and the subjectivity of qualitative methods. However, steps were taken to reduce subjectivity as the researcher's supervisor also coded and identified themes. In addition, reliability and validity criteria (Campbell et al., 2013; Guba, 1981) was employed during the data analysis stage to improve the credibility of the findings (see section 6.3.3.2.).

While a sample of 26 is more than adequate for thematic analysis (Guest et al., 2006), there are longstanding concerns around the generalisability of findings in qualitative research (Shenton, 2004; Breakwell et al., 2012). In accordance with arguments by Guba (1981), true generalisability is difficult because the thematic analysis was employed to study PTG experiences among a group of survivors with cumulative adverse events. In this case, the findings may only be applicable to survivors who have experienced similar adverse events and under similar circumstances, rather than the wider population of people who experience adversity. While the goal of qualitative research is to provide rich contextualised understandings of relationships rather than to generalise (Breakwell et al., 2012), clear details of the method and conditions used to collect and interpret the data were provided (see section 6.3.). These details therefore allow other researchers to determine the transferability of these findings beyond this study to other populations reporting PTG after adversity.

Finally, it is possible that the views of all people exposed to adverse events were not captured in the study. Participants from Study 1 self-selected to take part in the qualitative follow-up. The self-selecting sample and the cathartic nature of the disclosing information within interviews means it is possible that those with a specific interest in the

topic may be overly represented in the study. However, statistical analysis (see section 6.3.3.1.) indicated that, with the exception of hyperarousal, the 26 survivors did not significantly differ on any other demographic or psychosocial characteristics, and are therefore largely representative of the original sample in Study 1.

6.5.4. Implications

The study has implications for understanding the process of PTG. It highlighted the unique and complex experiences of growth reported by survivors, and some of the psychological mechanisms which allow people to succumb or thrive following cumulative events. Theoretically, the key finding was the co-existence of distress and growth in survivor's reports, which goes against some prior literature (Kashdan & Kane, 2011; Salsman et al., 2009). It would seem that some distress is needed to encourage PTG, or vice versa. In addition, there may be a point where people may be overwhelmed by events, such that no growth can be experienced, thus qualitatively supporting ideas of a curvilinear relationship between growth and distress (Kleim & Ehlers, 2009). Although survivors' experiences are painful and distressing, clinicians and other individuals close to them need to be aware that positive gains can be reported simultaneously. This is all the more important as existing interventions may reduce the intensity of negative symptoms, but not necessarily facilitate PTG (Joseph & Linley, 2006). Clinically, the findings suggest it may be useful to focus attention on the social contexts in which growth can occur, such as a supportive home environment or therapeutic relationship as highlighted in the ACPM (Joseph et al., 2012), but rarely acknowledged elsewhere in the literature. Equally important is enhancing the role of cognitions which aid the processing of adverse experiences, which will be addressed in Chapter 7 and Study 3.

6.6. Chapter summary

This qualitative investigation was the first to draw attention to PTG processes as experienced by people with multiple and diverse adverse event histories. The PTG process is complex and individualised, encompassing a range of positive and negative

changes and their role in facilitating or inhibiting PTG development. Notably, types of rumination, the impact of adverse events on the sense of identity, and perceptions of control appeared to significantly influence the way in which survivors interpreted, processed and identified with their experiences. The way in which these cognitive factors can lead people to experience growth or distress will be examined further in Study 3, although prior to this, a brief literature review of these concepts is presented in Chapter 7.

CHAPTER SEVEN: Cognitive processing and posttraumatic growth – A literature review

7.1. Chapter introduction

Study 2 emphasised the importance of cognitive factors in the PTG experiences of individuals with a history of multiple adverse events. Specifically, types of rumination, identity and control perceptions were key to the experiences of survivors, which may explain why some people report more (or less) growth than others. Drawing upon the findings of Study 2, the current chapter reviews the emerging literature in respect of cognitive processing variables and PTG that will inform the development of Study 3. It will begin by highlighting the importance of examining cognitive variables in response to adverse events. Next, the chapter will discuss types of rumination, control perceptions, and perceived sense of identity, and their relations with PTG and PTS.

7.2. Cognitive processing and posttraumatic growth

Cognitive processing has been identified as a key factor in the development of PTG. In fact, the way people think about adverse events is regarded as an important indicator of how people are functioning in the aftermath of adverse events (Tedeschi & Calhoun, 2004). The confrontation with seismic life challenges can lead individuals to engage with existential questions about their meaning and purpose in life, the extent to which they are living to their values and goals, and review their life priorities (Martin, Tesser, & McIntosh, 1993; Roepke & Seligman, 2015; Tedeschi & Calhoun, 2004). The aforementioned cognitive processes can be further impacted by experiencing multiple types of adverse event. While studies of cognitive processing after multiple exposures are few, they suggest that more severe PTSD symptoms (Follette et al., 1996; Herman, 1992) and a sense of 'giving up' in the face of adversity, known as mental defeat (Wilker et al., 2017), can be experienced by survivors, beyond symptoms experienced by

survivors of a single adverse event. Thus, the influence of multiple types of adversity on cognitive processing may determine the level of PTG experienced.

Cognitive processing is framed in the ACPM and FDM as an integral part of an individual's attempt to rebuild world views and core beliefs following adversity that may be needed to experience PTG (Joseph et al., 2012; Tedeschi & Calhoun, 1995). However, the constructs are not well-defined in the models, and theorised relationships between cognitive factors implicated in PTG lack wider empirical validation. As Study 2 highlighted cognitions that can influence PTG processes and outcomes, further investigation is needed as to how they relate to one another to produce positive or negative outcomes during a person's struggle to understand the adverse event. Moreover, identifying cognitive pathways is crucial to understand how PTG can develop in some people, while others experience continued distress. The salient cognitive factors from Study 2 are discussed in more detail below with regard to their relationships with distress and growth.

7.3. Rumination

For some time, the term *rumination* has attracted negative connotations in the literature. Rumination has been defined as a "mode of responding to distress that involves repetitively and passively focusing on symptoms of distress and on the possible causes and consequences of these symptoms" (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, p. 400). Mikulincer (1996) broadly proposed three forms of rumination in response to perceived failure. The first type is characterised by a fixation on the causes and consequences of events, known as *state rumination*. Studies that subscribe to this view report that negative symptoms are maintained and exacerbated by self-focused thoughts. Research on depressed students found that those who dwelled on their own feelings endorsed more depressive symptoms (Nolen-Hoeksema & Morrow, 1993), suggesting that targeted thoughts can increase the saliency of the symptoms. The second rumination type is identified as *task-irrelevant rumination*. This is synonymous

with attempts to avoid or distract from thoughts about the event, which are instead directed towards unrelated events, people or goals (Mikulincer, 1996). This suggests that people may use rumination as a coping strategy to suppress negative thoughts in order to regulate emotional responses (Papageorgiou & Wells, 2001). In contrast, *action-focused rumination* is concerned with the pursuit of goals and correction of past failures (Mikulincer, 1996). It is adapted from earlier ideas (Martin et al., 1993) which argue that people engage in ruminative thought as a means to progress towards important unattained goals. Importantly, this conceptualisation of rumination is adaptive, in that rumination serves to retain information about the goal in memory and generate alternative paths to reach the goal. This is evidenced by findings that performance on cognitive tasks is enhanced in the context of the active exploration of thoughts aimed at correcting past mistakes (Ciarocco, Vohs, & Baumeister, 2010).

For some time, theorists in the PTS literature (Greenberg, 1995; Janoff-Bulman, 1992) have suggested that responses to rebuilding assumptions shattered by adverse events involve two distinct types of rumination: (1) involuntary, intrusive actions that try to accommodate new event-related information (*intrusive rumination*), and (2) more conscious and deliberate activities concerned with making sense of the event (*deliberate rumination*). Mikulincer's (1996) notion of *state rumination* is similar to the concept of intrusive rumination with a repetitive focus on the event and entailing distress, while *action-focused rumination* is alike deliberate rumination, which can be associated with positive changes to functioning. However, prior cognitive literature did not consider whether these two types of rumination relate to positive consequences, and instead focused on relations with pathological outcomes, such as PTSD and depression (e.g. Treynor, Gonzalez, & Nolen-Hoeksema, 2003). In contrast, Study 2 illustrated that not all rumination described by participants was negative (see Study 2, section 6.4.2.1.), as some actively sought to understand the meaning behind the event which helped them to experience growth. While intrusive thoughts are often considered in the context of distress (Ehlers & Clark, 2000; Horowitz, 1997), others regard intrusive thoughts as an

index of cognitive processing (Joseph, Williams, & Yule, 1995; Park, 2010). It is therefore important to assess rumination in a more neutral fashion, as opposed to conceptualising it in negative terms, to clarify its role in PTG.

The FDM and ACPM models implicate both intrusive and deliberate forms of rumination in the process of growth. As previously mentioned (see Chapter 2, section 2.6.2.1.), the nature and direction of relationships between cognitive factors in these models is largely based on knowledge generated through clinical experience. Some studies have started to assess whether intrusive and deliberate rumination are differentially related to PTS and PTG, as assumed by the FDM and ACPM (see below for discussion). However, there still remains a lack of wider empirical validation across samples, including people who experience multiple types of events. Both intrusive and deliberate rumination, and their relation to distress and growth, are discussed below.

7.3.1. Intrusive rumination

Some Study 2 participants described having cyclic thoughts about their adverse experiences which inhibited their growth. *Intrusive rumination* has been generally framed as unwanted, involuntary and repetitive thoughts that can interfere with everyday functioning. They can be difficult to control or stop, and if experienced, are upsetting or distressing (Clark & Rhyno, 2005; Nolen-Hoeksema & Morrow, 1991). Intrusions are viewed as sensory fragments of the adverse experience, in which further encounters with event-related stimuli can indicate danger (Ehlers et al., 2002). Reports of intrusive thoughts have often been associated with negative affect and changes in functioning, including depression (Nolen-Hoeksema & Morrow, 1993) and PTSD (Ehlers & Clark, 2000). This somewhat pathological view of intrusive thoughts is reflected in their inclusion within theories of PTSD development (Ehlers & Clark, 2000) and featuring among the core components of PTSD diagnostic criteria (American Psychiatric Association, 2013).

However, intrusive thoughts are regarded by other researchers as a natural and necessary response to adverse events (Horowitz, 1997; Janoff-Bulman, 1992; Joseph et al., 2012; Tedeschi & Calhoun, 2004). Intrusive rumination is argued to play a critical role in psychological adjustment by acting as a mechanism to integrate information about the adverse event with existing world beliefs and schemas. According to this view, attempts to reduce the discrepancy between event-related memories and core beliefs are a measure of 'successful' processing of adverse events (Greenberg, 1995). While a failure to integrate event-related information with existing beliefs can indicate inadequate processing of the event, the process can provide a useful indicator of the extent to which people process highly stressful experiences (Park, 2010). Thus, intrusive thoughts could reflect cognitive processing of adverse events, rather than being indicative of disorder.

Although postulated by the FDM over a decade ago, intrusive rumination has been empirically implicated in the process of PTG in some extant literature recently. This is a relatively recent development, as a growing body of work (Dekel et al., 2012; Jin et al., 2014; Kunst, Winkel, & Bogaerts, 2010a; Shakespeare-Finch & Lurie-Beck, 2014) considers intrusive thoughts within the context of PTSD and their relation to PTG. Both PTS and PTG are possible by-products from the emotional struggle with adverse events and may be related in some way (see Chapter 2, section 2.7.2.). It was on this basis that Study 1a was conducted to test this relationship from the outset, thereby examining one of the central research questions in this thesis (see Chapter 3). However, it may also be of value to assess ruminative thoughts in a manner that does not imply symptoms of PTS or other pathology, so as to identify the extent to which the *content* of people's thoughts can lead more (or less) PTG. Morris and Shakespeare-Finch (2011) examined growth among people diagnosed with a variety of cancers and found that intrusive rumination was strongly and positively correlated with PTG (r = .63). Meanwhile, Taku, Cann, Calhoun and Tedeschi (2009) also found that intrusive rumination was positively related to growth (r = .25). This suggests that intrusive rumination may play a role in people's experiences of positive change in a manner that is distinct from PTS symptoms.

However, the relationship between intrusive rumination and PTG is not always clear cut; some research finds that intrusive rumination is unrelated to PTG (Stockton et al., 2011). Stockton and colleagues (2011) reported that intrusive rumination was positively related to more deliberate attempts to think about the event, which in turn was associated with increased growth. It is suggested that intrusive rumination may serve to keep the event in mind and motivate further cognitive processing that can lead to PTG at a later stage (Taku et al., 2009). Therefore, intrusive rumination alone may not be sufficient enough to trigger PTG, hence more research is needed.

7.3.2. Deliberate rumination

Intrusive thoughts may precede more effortful cognitive activity that is required to promote growth. Indeed, some Study 2 participants provided accounts of voluntary and intentional attempts to understand events and their implications. The FDM and ACPM both make reference to active attempts to understand the meaning and implications of adversity, known as *deliberate rumination*. Compared to the potentially distressing nature of intrusive rumination, deliberate rumination is framed in both models as a purposeful and intentional form of thinking that is likely related to PTG (Joseph et al., 2012; Tedeschi & Calhoun, 2004). For example, Taku and colleagues (2009) found that deliberate rumination was the strongest determinant of growth, over and above the effects of intrusive rumination. This finding suggests that not all ruminative content is negative, as previously thought (Nolen-Hoeksema & Morrow, 1993; Wänke & Schmid, 1996). Other research has focused on relationships between intrusive and deliberate forms of rumination. In their model of PTG cognitive processes, intrusive rumination demonstrated a moderately positive relationship (β = .43) with deliberate rumination, using the Event-Related Rumination Inventory (Triplett, Tedeschi, Cann, Calhoun, & Reeve, 2012; described in Study 3, section 8.4.2.). This would offer support to the FDM and ACPM frameworks which argue that intrusive rumination is a precursor to more deliberate attempts to contemplate and better understand the situation (Joseph et al., 2012; Tedeschi & Calhoun, 2004). In many ways, both intrusive and deliberate

rumination are construed as adaptive, with intrusive forms serving as a catalyst for more problem-focused and deliberate attempts to engage with the stressor.

While extant empirical studies have largely found that deliberate rumination is positively related to PTG, this is not always consistent and may be due to difficulties in measuring this concept. Taku and Oshio (2015) reported that deliberate rumination was only associated with five of the 21 items on the PTGI measure of growth, suggesting that other variables (such as perceived control and event centrality discussed in sections 7.4. and 7.5.) may influence the degree of PTG reported, which were not accounted for in their study. In addition, studies of deliberate rumination are primarily confined to specific samples, such as cancer patients (Cohen & Numa, 2011; Hirooka, Fukahori, Taku, Togari, & Ogawa, 2017), or students (Taku et al., 2009), and so whether the positive relationship of deliberate rumination to PTG is robust across other types of event is largely unknown. As previously argued (see Chapter 2, section 2.7.3.2.), the focus on a specific type of event does not always account for the multiple types of events that people can experience in their lifetime. Study 2 participants reported deliberate rumination following a variety of experiences, rather than one single event. Furthermore, other PTG studies have used unvalidated measures of cognitive processing to assess deliberate rumination. Salsman and colleagues (2009) used four-items from a self-constructed scale to measure cognitive rehearsal processes with only adequate reliability (Cronbach's $\alpha = .69$), which may not be sufficient enough for more comprehensive investigations of cognitive processing factors. Consequently, there is a need to examine the role of deliberate rumination in the context of other cognitive variables among a broader spectrum of adverse events using validated measures.

As discussed, intrusive and deliberate forms of rumination have been identified in theoretical PTG models and have recently started to receive more systematic empirical attention in the literature (e.g. Cárdenas, Arnoso, & Faúndez, 2016; Stockton et al., 2011; Taku et al., 2009). The distinction between the two forms of rumination is important because they have been shown to exert different effects on psychological adjustment in

the aftermath of adverse events. In turn, this may explain why some people are more (or less) likely to report PTG and PTS than others. However, the cognitive processing that occurs following adverse events is recognised to be far more complex than being solely attributable to rumination alone (Lancaster, Klein, Nadia, Szabo, & Mogerman, 2015; Tedeschi & Calhoun, 2004; Triplett et al., 2012). This was illustrated within the themes of Study 2, where participants not only described rumination processes, but also the impact of multiple types of adverse events on their sense of autonomy and identity. Given this finding, there is a need to examine other cognitive factors that help to explain adjustment following adverse events.

7.4. Perceived control

Another central theme within the Study 2 interviews was that of perceived control, which appears to have been significantly challenged by survivor's adverse experiences. Control perceptions are important as humans are intrinsically motivated to exert autonomy and competency in their environment (Ryan & Deci, 2000). However, there appears to be no explicit discussion of control perceptions within the PTG literature (discussed later in this section), compared to the psychosocial factors that have received more attention and were subsequently the focus of Study 1. Over 100 conceptualisations of control exist in the literature (see Skinner, 1996) which have been organised into categories including *objective control* and *subjective control*. *Objective control* refers to *actual* control a person has in an event, whereas *subjective control* relates to the extent to which individual *perceives* that their behaviour can influence the outcome of a situation (Frazier, Berman, & Steward, 2002). Perceived controllability is more closely associated with later adjustment compared to objective controllability, and the two concepts may not necessarily align (Foa, Zinbarg, & Rothbaum, 1992). For example, two people witness a family bereavement due to a terminal illness, which could be construed as an objectively uncontrollable event. One person may view the experience as controllable, and another as uncontrollable. The focus is therefore on individual differences in the *perception* of the situation which may explain adjustment after adverse events.

Perceived control is also a relevant construct in the study of PTS. Theories of PTSD development (Ehlers & Clark, 2000) suggest that events that are viewed as uncontrollable are more likely to lead to PTSD than those that are viewed as controllable. Adverse events can challenge individual perceptions of control over one's life and environment. People may respond with attempts to regain control over their situation (Frazier & Caston, 2015), or resign themselves in a sense of helplessness (Mikulincer, 1996). Therefore, the way in which the survivor attributes control perceptions could be a good indicator of subsequent psychological adjustment (Joseph, Brewin, Yule, & Williams, 1991).

One aspect of perceived control that has received less attention in the literature is the temporal dimension. This dimension proposes that past, present and future perceptions of control (described below) have different relations with psychological adjustment (Frazier et al., 2012). As highlighted in Skinner's (1996) review, research has instead considered behavioural and cognitive control typologies. There have been calls for more investigations into temporal aspects of human psychology more generally, with Zimbardo and Boyd (1999) concluding that "few other psychological variables are capable of exerting such a powerful and pervasive impact on the behaviour of individuals" (p. 1284).

In the realm of adverse events, the temporal dimension is often implicit in discussions of adjustment and recovery. Scholars (Taylor, 1983) have advocated that adaptation from adversity can involve a search for meaning (i.e. 'What caused the event to happen?'), attempts to regain mastery (i.e. 'How can I manage the event now?') and illusory processes (see Chapter 2, section 2.6.2.1.; i.e. 'How can I feel good about myself going forward?'). These reflect a past, present and future orientation of adjustment after adverse events, which are not explicitly recognised in PTSD (Ehlers & Clark, 2000) or PTG (Joseph et al., 2012; Tedeschi & Calhoun, 2004) models. Similar sentiments were echoed in Study 2 interviews, with participants noting attempts to exert control over their recovery (present control), and a sense they could manage future stressors (future

control). Thus, a focus on temporal aspects of control can offer new insight into positive as well as negative psychological adaptation from threatening life events. Furthermore, control perceptions have been studied exclusively within the PTS literature (Foa et al., 1992; Frazier et al., 2004), and so their contribution to PTG is unknown.

The study of temporal control also has relevance to understanding the *quality* of PTG experienced, one of the wider aims of the thesis (see Chapter 3, section 3.2.). The JFM (Maercker & Zoellner, 2004) and other theorists (Taylor, 1983; Taylor & Brown, 1988) argue that PTG can entail exaggerated perceptions of control, at least in the short-term. According to this view, it is not uncommon for people to display illusions of control in situations that have occurred simply by chance. If people expect a particular outcome to occur and this does occur, people may overestimate their role in achieving this outcome even if the event was actually out of their control (Nadelhoffer & Matveeva, 2009; Taylor & Brown, 1988). Thus, if increased perceptions of control are positively associated with distress, this may indicate that control perceptions are not entirely associated with improved well-being as usually framed (Frazier et al., 2002). Furthermore, positive associations between growth and perceived control may also reflect a distorted perception of self-enhancement that may not reflect actual control over the situation. On the contrary, individuals who have high control perceptions may not necessarily have the impetus to experience PTG as they already possess such characteristics. To date, these questions have not yet received empirical attention and would further help to elucidate the PTG process.

According to the framework proposed by Frazier and colleagues (2002), perceived control can be understood in terms of *past* (i.e. 'Could I have prevented the event occurring?'), *present* (i.e. 'What can I do about the situation now?') and *future control* (i.e. 'Can I prevent this in the future?'), all of which exert differential effects on adjustment following adverse events. *Past control* refers to whether a person feels they had control over an event. This dimension is generally unrelated to adjustment or associated with increased distress. A study of control perceptions across bereaved

persons and sexual assault survivors found no relationship between control and distress (Frazier et al., 2004). Meanwhile, survivors of a shipping disaster who made more internalised attributions also reported more intrusive symptoms and depression (Joseph et al., 1991). Attempts to exert control over essentially uncontrollable adverse events in the past may therefore not be beneficial or necessary for PTG. However, *present* and *future control* appear to relate more closely to adjustment.

7.4.1. Present control

Present control is concerned with how people try to maintain control over a current aspect of an event (Frazier, et al., 2002). Research has consistently confirmed that *present control* is associated with better adjustment. In a study of female sexual assault survivors, present control (construed as control over one's recovery) was negatively related to PTSD symptoms (Ullman & Peter-Hagene, 2014). This echoes findings from earlier studies of sexual assault survivors and bereaved persons (Frazier et al., 2004), and people with heart problems (Moser et al., 2009), all suggesting that greater perceptions of *present control* are related to less distress, depression and anxiety. Thus, *present control* may be adaptive as it focuses one's attention on controllable factors in an otherwise uncontrollable situation, with associated improvements in well-being. Indeed, Study 2 participants who reported more control also disclosed more optimistic views and self-esteem. The PTG literature speaks of positive growth with themes of mastery, autonomy and control, which may be lost in immediate aftermath of adverse events (Joseph et al., 2012; Taylor, 1983). As *present control* appears to exert strong and beneficial effects on psychological functioning it is likely also related to PTG, although this requires quantitative study to confirm the qualitative findings observed in Study 2.

7.4.2. Future control

Finally, *future control* refers to the extent to which an individual believes they have control over an event reoccurring (Frazier, et al., 2002). *Future control* has

demonstrated mixed relations with adjustment in the literature. In some studies, a forward-looking temporal orientation has been associated with improved perceptions of hope and fewer depressive symptoms among women who experienced intimate partner violence (Clements et al., 2004), and lower PTSD symptoms among survivors of sexual assault (Frazier et al., 2004). Other studies using cancer patients (Carver et al., 2000) and a more diverse range of events (Frazier et al., 2012) find no association between *future control* and adjustment. To add to this complex picture, another study using undergraduates exposed to a wide range of adverse events found that *future control* was positively correlated with more event-related distress (Frazier & Caston, 2015). It is difficult to draw conclusions from these studies however, as they used inconsistent measures to capture future perceived control, or relied on single-item measures. The qualitative findings in Study 2 revealed great depth to people's experiences of control and growth. However, there is equally a clear need to use empirically-validated measures that could help simplify relationships between perceived control and PTG observed in Study 2, and clarify associations between perceived control and PTS given mixed findings in the literature. It may be that future control is positively related to PTG, such that overcoming previous adversity will reinforce perceptions that future events are also more controllable. At present, this possibility has not been quantitatively explored and requires further investigation.

7.5. Event centrality

Many participants' statements in Study 2 reflected the integration of personal adversity into their life story. While Study 2 did not wish to speculate on prevalent themes prior to interviewing participants, the extent to which adverse events shaped personal narratives as a strong theme was surprising, and hence this concept is now being explored in further detail for Study 3. *Event centrality* is understood as the degree to which people exposed to an adverse event define themselves in part or exclusively as someone who has experienced adversity (Berntsen & Rubin, 2006). The extent to which an event has become central to a person's identity has gained interest as a focus of

study in recent years in the PTS literature (e.g. Bernard, Whittles, Kertz, & Burke, 2015; Boelen, 2012; Fitzgerald, Berntsen, & Broadbridge, 2016).

According to Berntsen and Rubin (2006), event centrality can be characterised by three aspects. First, adverse events can serve as an 'anchoring point' which contain vivid memories that can invoke intense feelings (Pillemer, 2001). For example, some Study 2 participants spoke of "getting back" at their abuser as a means to achieve PTG. These memories can then serve to tie the event to long-term goals and serve as a reference point for everyday inferences, although this can interfere with psychological functioning. As adverse events are highly accessible in memory, they may generate a sense of serious threat, resulting in intrusive thoughts, worries and precautionary measures, as identified in PTSD models (e.g. Ehlers & Clark, 2000). In this manner, people may also overestimate the risk of being exposed to similar adverse events in the future, whether or not any perceived danger is grounded in reality (Berntsen & Rubin, 2006).

Second, adverse events can serve as a turning point in an individual's life story (Berntsen & Rubin, 2006). It is the memories of significant life events, rather than the events themselves, that can alter or redirect the life course or plan (Pillemer, 2001). Early transitional theories (Hopson, 1982) speculated that events such as births, first jobs, marriage and death, would enable the pursuit of new goals and life choices. These events may therefore be viewed as the end of one 'chapter', and the beginning of another. Indeed, participants in Study 2 often drew distinctions between their 'old' and 'new' selves after the adversity. As memories of adverse events are salient and highly accessible, they can be considered as causal agents in the life story (Berntsen & Rubin, 2006). However, viewing events in this way can lead some people to interpret all subsequent events with reference to their adverse experiences, and ignore other possible explanations (Berntsen & Rubin, 2007).

Third and finally, adverse events can become a key component of a person's identity (Berntsen & Rubin, 2006). Identity is argued to take the form of a life story which comprises an individual's interactions with the world and in turn provides meaning and purpose (McAdams, 2008). Thus, if a particular event is viewed as a turning point in an individual's life story, it is likely to define their identity. Interpreting the adverse event as central to one's identity may lead to the development of a negative global, stable and internal attributional style. This attributional style is characterised by self-blame, helplessness across a wide variety of situations as opposed to the specific event, and low self-esteem (Seligman, Abramson, Semmel, & Von Baeyer, 1979), and has been implicated in PTSD development (Janoff-Bulman, 1992). Some Study 2 participants reported that their adverse events had effectively subsumed their own personality, illustrating the extent to which adverse events can become engrained in an individual's sense of self-identity.

To date, the vast majority of studies that have considered event centrality have done so in the context of PTS. Existing research indicates that returning military servicemen and women (Brown, Antonius, Kramer, Root, & Hirst, 2010), survivors of terrorism (Blix, Solberg, & Heir, 2014) and sexual assault (Robinaugh & McNally, 2011) who perceive their experiences as more central to their identity also report more PTS symptoms. Centrality does have some grounding as a concept in its own right, as studies have shown it can positively predict PTS independently of other symptoms, such as depression and dissociation (Brown et al., 2010). Study 2 participants also spoke of how their prior adverse events had led to the difficulties they were now experiencing. However, the mechanisms by which event centrality leads to distress are still poorly understood.

While event centrality appears to be a key factor in psychological adjustment following adverse events, few studies have examined relationships with positive outcomes, such as PTG. Recent evidence finds that PTG and PTS are *both* uniquely predicted by event centrality. Groleau, Calhoun, Cann and Tedeschi (2013) found that

event centrality was positively related to growth and distress among undergraduate students reporting a range of adverse events. The findings have been replicated in other samples of undergraduates (Barton, Boals, & Knowles, 2013), stroke survivors (Kuenemund et al., 2016), and people exposed to a terrorist attack (Blix, Birkeland, Hansen, & Heir, 2015), suggesting that growth and distress are related but conceptually distinct outcomes. Some Study 2 participants also reported that their sense of identity had succumbed to their experiences, while others drew upon prior events to motivate themselves "to do better" in life. Event centrality has also been shown to relate to PTG outcomes when controlling for the nature of the event, coping styles and depression (Boals & Schuettler, 2011). Thus, adverse events are critical to identity formation and can serve as a lens with which to frame current and future events. However, knowledge is limited in respect of the extent to which event centrality is associated with other cognitive variables such as rumination, which has demonstrated relationships with PTG and PTS (see section 7.3.). As such, there is a need to expand knowledge in respect of the circumstances in which event centrality can lead to growth and distress.

7.6. Chapter summary

This chapter discussed the cognitive concepts of rumination, perceived control and event centrality which emerged as strong themes in Study 2 interviews. As demonstrated in this review, the constructs are generally well-established in the PTS literature but remain a relatively recent addition to our understanding of PTG. While studies have separately linked rumination, perceived control and event centrality to positive and negative outcomes following adverse events, the pathways by which these variables are associated with growth and distress remain unclear. It is therefore necessary to continue to expand literature in respect of cognitive processing and PTG through further systematic investigations. Study 3 will therefore outline the rationale for assessing relationships between rumination, perceived control and event centrality by discussing how these cognitive variables can interact with one another to result in PTS or PTG.

CHAPTER EIGHT: Rumination, event centrality and perceived control as predictors of posttraumatic growth and distress – The Cognitive Growth and Stress model[30]

8.1. Chapter introduction

Study 2 revealed great depth and complexity to the experience of growth among survivors of multiple types of adverse events, noting that distress was intertwined with the experience of PTG. It would therefore seem appropriate to further explore relationships among cognitive variables identified in that study that may highlight differential pathways towards PTG and PTS. Cognitive approaches to the processing of adverse events have received significant attention in the PTS literature (e.g. Brewin & Holmes, 2003; Ehlers & Clark, 2000), as subjective appraisals are thought to play a key role in the way events influence subsequent psychological adjustment. By comparison, attempts to model causal pathways of cognitive processing to explain positive psychological change after adversity are less well-developed. Building upon the interview findings from Study 2, Study 3 will develop a model to explain and simplify complex relationships between salient cognitive factors to illustrate pathways towards growth and distress after adversity.

Models have started to map pathways towards growth and distress, representing positive and negative outcomes from adverse events, of varying scope and complexity. For example, one study has traced the entire process of PTG outlined in the FDM, from the initial disruption of core beliefs, to meaning making and subsequent life satisfaction (Triplett et al., 2012). Recently, an integrated model was developed (Lancaster et al., 2015) that identified shared and unique predictors of PTG and PTS, suggesting that

[30] This study was published: Brooks, M., Graham-Kevan, N., Lowe, M., & Robinson, S. (2017). Rumination, event centrality and perceived control as predictors of posttraumatic growth and distress: The Cognitive Growth and Stress model. *British Journal of Clinical Psychology, 56*, 286-302.

growth and distress may be determined by multiple cognitive processes. However, the aforementioned models are limited in several respects. First, the Triplett et al. (2012) and Lancaster et al. (2015) models are based on data provided by undergraduate samples, which may not reflect the overall life experiences of many people exposed to adverse events. Second, the two models rely on path analysis, which does not control for measurement error in the variables and thus limits conclusions about the constructs being measured (Kline, 2016). Furthermore, the Triplett et al. (2012) and Lancaster et al. (2015) models do not account for other cognitive variables associated with psychological adjustment after adversity, such as event centrality and control perceptions which Study 2 found to be critical in survivors' PTG experiences. There is a need to conduct more sophisticated analysis of cognitive processing factors implicated in the process of growth and distress.

8.2. The proposed cognitive model

This study expands upon the FDM (Tedeschi & Calhoun, 2004) and ACPM theories (Joseph et al., 2012), and existing research (Lancaster et al., 2015; Triplett et al., 2012) by incorporating cognitive constructs into a model to explain PTG and PTS (see Figure 7). The model, termed the Cognitive Growth and Stress (CGAS) model, depicts relationships between intrusive and deliberate rumination, event centrality, and present and future perceptions of control.[31] In doing so, this chapter explores interrelationships between theoretically-derived growth concepts as well as those rarely explored in the PTG literature. The rationale for the direction of relationships in the model is described in section 8.2.1.

[31] The model originally intended to include event characteristics (childhood adversity, interpersonal event and multiple types of events) to follow-up findings from studies 1 and 2 by assessing cognitive pathways from event characteristics to distress and growth. However, including more variables would introduce additional complexity into the analysis and interpretation of the findings, which goes against the parsimonious nature of SEM (Kline, 2016). When the variables were added, the model demonstrated extremely poor fit, which is common in models with many variables (Kline, 2016). In this case, it is recommended to remove variables that contribute little variance or demonstrate non-significant relationships in the model (Byrne, 2016). Furthermore, they did not display significant relationships wither other variables in the model and were thus removed.

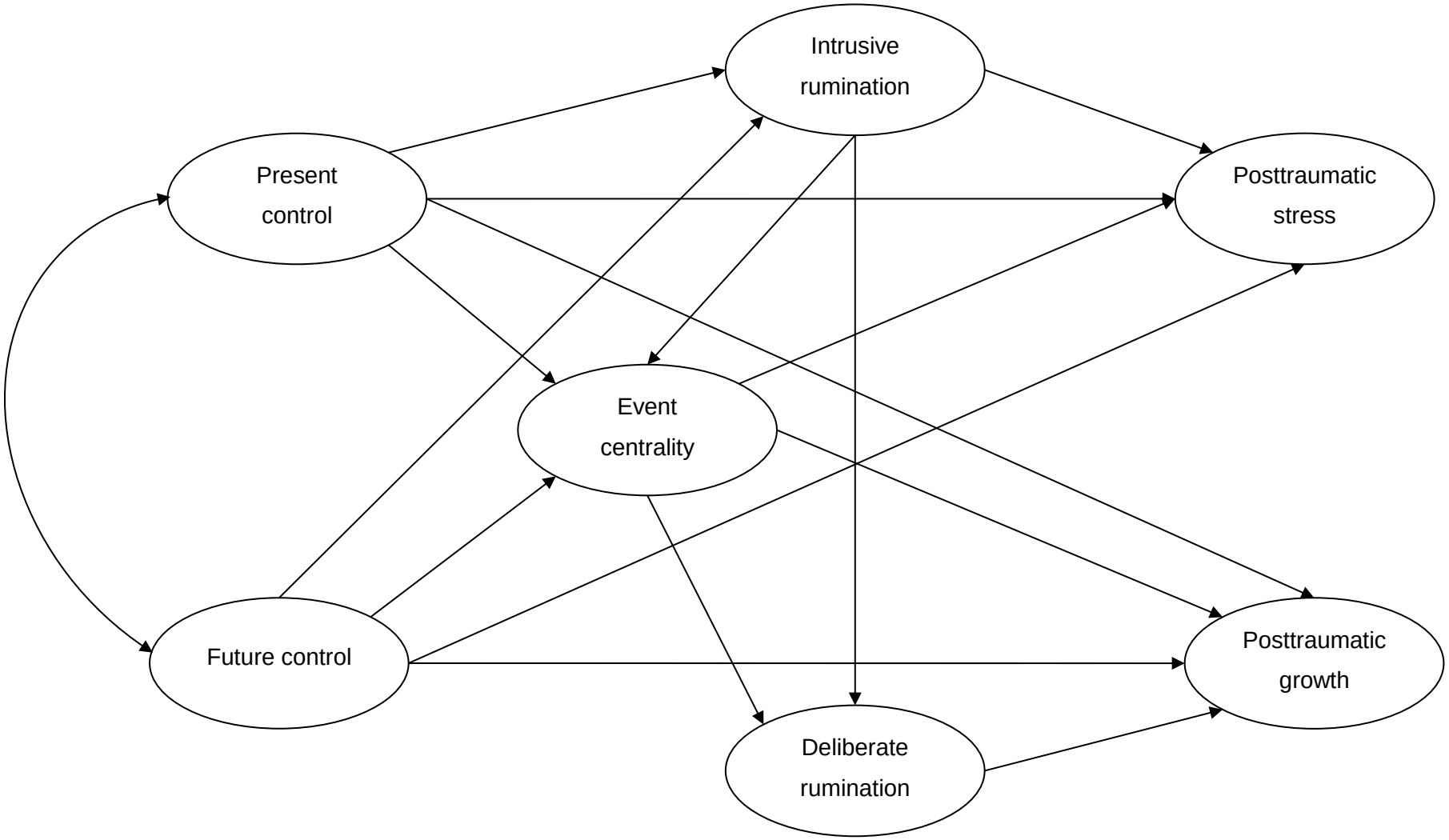

Figure 7. Hypothesised Cognitive Growth and Stress model.

8.2.1. Relationships between rumination, event centrality, perceived control, posttraumatic growth and posttraumatic stress

The proposed CGAS model will simplify complex relationships among cognitive factors responsible for growth and distress. There is little research on relationships between rumination and perceived control, although rumination could occur due to an absence of control (Wänke & Schmid, 1996). It may be that the less control people feel over current and over potential future events, the more they tend to ruminate. Ruminative processes can trigger PTS symptoms, but also deliberate attempts to understand the meaning of the adverse event. Conversely, survivors with higher control perceptions are less likely to experience intrusive rumination or PTG, as they may be less challenged by adverse events (Tedeschi & Calhoun, 2004).

The CGAS model posits relationships between event centrality and rumination. Evidence indicates that centrality is closely aligned with rehearsal and ruminative processes that are focused on negative and self-relevant aspects of the event (Boals & Schuettler, 2011; Nolen-Hoeksema et al., 2008). In other words, allowing the event to become central to one's identity leads to a constant rehearsal of memories related to the event over time, which can strengthen their emotional intensity. Meanwhile, rumination is argued to have an adaptive quality, depending on the context (Bonanno, Pat-Horenczyk, & Noll, 2011; Kato, 2012). For example, the extent to which an adverse event becomes fundamental to one's identity may influence rumination adaptiveness. The CGAS model theorises that central events motivate a shift from distressing thoughts to more deliberate forms of rumination that bring about positive shifts in world view and attribute meaning to experiences (Berntsen & Rubin, 2006). Specifically, increased levels of intrusive rumination lead to the event becoming part of a survivor's identity through rehearsal processes, which set in motion cognitive processing associated with the development of both PTG and PTS. While distressing, highly central events may be processed in more meaningful ways, due to their relative importance to the individual.

The CGAS model also specifies relationships between centrality and control perceptions that are largely unexamined in the literature. Highly central events result from significant challenges to control perceptions that lead a person to focus on aspects of their life that may be explained by the adversity (Boals & Schuettler, 2011). Attributional theories (Seligman et al., 1979) posit that uncontrollable views of the event aftermath arise as a result of internalised, stable and global attributions. Such attributional styles mean that survivors with low control perceptions experience memories of the event as being ingrained within their self-identity. This is reflected in the CGAS model, which proposes that both present and future control perceptions are negatively related to event centrality. The degree to which current and future events are perceived to be controllable, and their subsequent impact on one's sense of identity, may explain differential outcomes after adversity.

8.3. Aims of study

The CGAS model expands existing PTG theories (Joseph et al., 2012; Tedeschi & Calhoun, 2004) by identifying cognitive pathways towards PTG and PTS through relationships between rumination, event centrality, and control factors. It is expected that present and future control are positively associated to one another as they fall within the temporal dimension of control. As the experience of adversity can challenge control perceptions, present and future control will negatively predict event centrality as the adversity becomes assimilated into one's self-identity. It is also expected that a lack of present and future control will predict intrusive rumination. Increased intrusive thoughts will then positively predict centrality as the event becomes internalised, which then leads to deliberate rumination. Based on existing literature, it is hypothesised that intrusive rumination will positively predict PTS and initiate more deliberate forms of rumination, which will positively predict PTG. Finally, as growth may reflect attempts to regain mastery and control, both present and future control are hypothesised to positively predict PTG, and therefore negatively predict PTS.

8.4. Method

8.4.1. Participants and procedure

Given that previous research (Linley & Joseph, 2004; Ozer, Best, Lipsey, & Weiss, 2008) and studies 1 and 2 in this thesis show that PTG and PTS can be reported across a range of events and populations, the current study required adults with at least one adverse event to participate. Participants were a self-selecting sample of 250 people (74.4% female) exposed to at least one adverse event, recruited via university-wide online bulletins (36.4%), victim services (32.8%) and professional networks (30.8%) from northwest England.[32] The mean age of participants was 35.21 years (*SD* = 13.41), ranging from 16 to 79 years. The majority of the sample were heterosexual (83.2%) and White (88.0%), with less than half identifying as religious (48.0%). Nearly two-thirds of participants were single or dating (64.9%). While all participants had at least one prior exposure to an adverse event, the majority (82.5%) experienced more than one event and three-quarters of the sample (75.2%) experienced an interpersonal event.[33] Demographic and adversarial exposure characteristics for the participants is presented in Table 10.

The study procedure was identical to that outlined in Study 1 (see section 5.5.1.). As with Study 1, participants were invited to nominate one specific adverse event of their choice and respond according to their symptoms on a range of measures within the past two weeks. The study received institutional ethics approval from the University of Central Lancashire (see Appendix IX).

[32] PTG was not significantly different across the sampling sources [F (2, 247) = .40, p = .697, η^2 = .00].

[33] Consistent with Study 1, interpersonal acts were classed as a serious attack or threat(s), sexual assault, sexual abuse and rape, military conflict, and neglect.

Table 10*. Sample and adverse event exposure characteristics*.

Characteristic	*M*	*SD*	Range
Age at serious event (years)	20.21	12.01	1 – 57
Time since serious event (years)	15.00	13.83	1 – 61
Number of event types	3.73	2.49	1 – 9
		N	%
Event type			
Accident		116	46.4
Natural disaster		22	8.8
Serious attack/threat by partner		69	27.6
Serious attack/threat by other		112	44.8
Child sexual abuse		74	29.6
Rape by partner		31	12.4
Rape by other		37	14.8
Imprisonment		21	8.4
Military conflict		19	7.6
Serious illness		57	22.8
Bereavement		121	48.4
Neglect		69	27.6
Other event		58	23.2

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8.4.2. Measures

Adverse experiences. The 12-item checklist from the PDS (Foa et al., 1997), described within Study 1 (section 5.5.2.), was used to measure adverse event history.

Event centrality. The Centrality of Events Scale (CES; Berntsen & Rubin, 2006) is a measure of the extent to which an individual feels a particular event has become part of their identity. The short version used in this study demonstrates similar reliability to the full 20-item version (Berntsen & Rubin, 2006) and consists of seven items rated on a scale from 0 (totally disagree) to 4 (totally agree). Example items include, “I feel the event has become part of my identity”, and “This event has permanently changed

my life". Higher scores on the CES suggest the event is more central to the survivor's life story. The CES demonstrated high reliability in the current study (α = .92).

Rumination. Intrusive and deliberate rumination was measured using the Event Related Rumination Inventory (ERRI; Cann et al., 2011). Intrusive thoughts are assessed by 10 items regarding unwanted thoughts about the event, such as "I could not keep images or thoughts about the event from entering my mind". Ten additional items measure deliberate attempts by a survivor to understand the event, with items such as, "I thought about whether I have learned anything as a result of my experience". For both subscales, participants rate the extent to which they agree with the statements on a scale from 0 (not at all) to 3 (often), with higher scores endorsing more ruminative tendencies. The ERRI has been shown to display good construct validity (Cann et al., 2011). Reliability for the ERRI intrusive (α = .96) and deliberate (α = .93) subscales was high in the current study.

Perceived control. The Perceived Control Over Stressful Events Scale (PCOSES; Frazier et al., 2011) is a 17-item questionnaire that assesses temporal aspects of control regarding a specific adverse event. The measure has three subscales of past, present and future control, rated on a scale from 0 (strongly disagree) to 3 (strongly agree), with higher scores on any given subscale reflecting greater perceived control. As past control is generally unrelated to adjustment (see Chapter 7, section 7.4.), only the present and future subscales were used in this study. Items include, "How I deal with this event is now under my control" (present control) and "I have no control over whether a similar event happens again" (future control). On the present and future control subscales, a total of six items are reverse coded, such that values of 0 are assigned to *strongly agree* and 3 to *strongly disagree*. The PCOSES demonstrates good validity, test-retest reliability and internal consistency (Frazier et al., 2011), which was replicated for the present (α = .79) and future control (α = .80) subscales in this study.

Posttraumatic growth. The 10-item PTGI-SF (Cann et al., 2010; see Study 1, section 5.5.2. for description) was used to measure perceived positive changes from the adverse event. The measure demonstrated high internal consistency in the current study (α = .87).

Posttraumatic stress. The 8-item PTSD-8 (Hansen et al., 2010), described in section 5.5.2. of Study 1, was used to measure PTS symptoms. Initially, the overall scale demonstrated unacceptable reliability (α = .38), however, the removal of two intrusive items[34] greatly improved consistency (α = .90). The six-item version was thus used for the remaining analyses.

Demographic information was also obtained to ascertain sample characteristics. Copies of the measures used in the current study are provided in Appendix X.

8.4.3. Data analysis

Structural equation modelling (SEM) was used to analyse the seven variables of intrusive rumination, deliberate rumination, centrality, present control, future control, PTS and PTG. Typically, SEM models should be parsimonious as possible, balancing the need to explain complex phenomenon on theoretical grounds with statistical fit indices (Byrne, 2016). SEM has advantages over path analysis techniques. The main benefit of using SEM methodology is that it allows the modelling of multiple unobserved (or *latent*) variables and observed (*indicator*) variables, allowing the researcher to evaluate the measurement and structural model separately (Byrne, 2016). In doing so, the model corrects for measurement error in the observed variables, unlike path analysis. Furthermore, SEM was deemed appropriate for the present study as it requires sample sizes of at least 200 participants to produce meaningful findings (Kline, 2016).

[34] The two items removed were item 2: “Feelings as though the event is happening again” and item 3: “Repeated nightmares about the event”.

Hypotheses were examined in four phases, using SPSS (version 23) and AMOS (version 23) with maximum likelihood estimation. The first phase consisted of assumption testing to ensure the data met the expectations of SEM analysis (see section 8.5.1.). The second phase evaluated the measurement model (see section 8.5.2.) through confirmatory factor analysis (CFA) according to established procedures (Kline, 2016).[35] During the CFA, the relationship between the latent variables and their indicators was examined using several model fit indices described below. Intrusive rumination, deliberate rumination, event centrality, present control, future control, PTG and PTS were represented by latent constructs, with items from the measures serving as indicators. The unobservable latent variables were conceptualised according to the sample realisation interpretation (Bollen, 2002), a flexible and inclusive definition considering such variables as not fully present, yet estimated from information within the data. Within the second phase, steps were taken to improve model fit by assessing reliability and validity issues, removing low loading items and correlating theoretically-related error terms, described below.

Reliability and validity was assessed in the measurement model using recognised criteria (Fornell & Larcker, 1981; Hair, Black, Babin, & Anderson, 2010). Internal reliability was assessed using Composite Reliability (CR) in place of Cronbach's α, the latter of which can underestimate reliability in SEM models (Fornell & Larcker, 1981). However, CR can be interpreted similarly to Cronbach's α, while it takes into account the different loadings of the indicators on the latent variable; values above .70 indicate good reliability. Convergent validity was examined using the Average Variance Extracted (AVE), which determines the extent to which the indicator variables represent the latent construct; values should ideally exceed .50 (Fornell & Larcker, 1981). Discriminant validity was

[35] In some cases, data for SEM may undergo an exploratory factor analysis (EFA) to establish the factor structure, which is then validated in CFA (Anderson & Gerbing, 1988). However, the study variables were captured using measures already validated among populations exposed to adversity, including accidents, physical and sexual assault, military conflict and medical problems (Berntsen & Rubin, 2006; Cann et al., 2010, 2011; Frazier et al., 2011). In these circumstances, it was not necessary to conduct an EFA of the data as the structure of the scales was already pre-determined (J. C. Anderson & Gerbing, 1988).

assessed by the Maximum Shared Variance (MSV). MSV values should fall below that of the AVE, indicating that the constructs are empirically distinct (Hair et al., 2010). Indicators loading greater than .60 were considered to represent the latent factor well (Kline, 2016). The indicators of the latent variables were not aggregated or parcelled, as it was desirable to produce a model as close to the collected data as possible (Little, Rhemtulla, Gibson, & Schoemann, 2013). One further approach to improve model fit is to correlate pairs of error terms. This method is considered appropriate providing there is a theoretical justification in the data to do so (Bagozzi & Yi, 1988; Little et al., 2013).

Third, the structural model was considered to determine the strength and direction of relationships between the seven latent variables (see sections 8.5.4. and 8.5.5.). It was evaluated using several fit indices recommended in SEM guidelines (Hu & Bentler, 1999; Kline, 2016). The chi-square (χ^2) was computed as a goodness of fit measure, where a non-significant result indicates a good fitting model. However, it is sensitive to sample size in large samples and so the chi-square to degrees of freedom ratio (χ^2/df ratio), Akaike Information Criterion (AIC), Comparative Fit Index (CFI), Tucker-Lewis index (TLI), Root Mean Square Error of Approximation (RMSEA) and Standardised Root Mean Square Residual (SRMR) were calculated. The χ^2/df ratio is less likely to make type I errors, with a value of less than 2 representing good model fit (Hair et al., 2010). The AIC compares the parsimony of the model relative to other models, with smaller values desirable (Kline, 2016).

The CFI, TLI, RMSEA and SRMR are advantageous in that they are less influenced by sample size and model complexity. The CFI and TLI test the assumption that all latent variables in the model are uncorrelated, on a scale of 0 (extremely poor model fit) to 1 (being excellent model fit); values for CFI and TLI should exceed .90 and ideally lie “close to .95” (p. 27), indicating that the model is a good representation of the data (Hu & Bentler, 1999). The RMSEA value is rated on a scale from 0 (excellent model fit) to 1 (extremely poor model fit), with values lower than .06 and confidence intervals

below .08 considered desirable (Hu & Bentler, 1999). Finally, the Standardised Root Mean Square Residual (SRMR) is a measure of the difference between the predicted and observed correlations in the data. A SRMR value below .08 is considered to represent good model fit (Hu & Bentler, 1999). In the fourth and final step, mediation analysis was conducted (see section 8.5.6.) to determine the presence of indirect effects within the model, using bootstrapping and bias-corrected confidence intervals (Hayes, 2013; see Study 1, section 5.18.3.).

Prior to the statistical testing, power analysis was undertaken to determine the appropriate sample size needed to find a significant result and reduce type II (false negative) errors (Cohen, 1988). Literature has suggested that rules of thumb for SEM are not always reliable indicators of sample size, which instead needs to considered relative to the model properties (Wolf, Harrington, Clark, & Miller, 2013). *A priori* power analyses conducted using online power calculator software (version 4) by Soper (2016)[36] indicated that a minimum sample of 170 participants would be needed to detect significant medium effects ($r \geq .30$; $p < .05$) using SEM with 80% power and seven latent variables. Furthermore, corrections to alpha values were made for directional hypotheses by halving *p* values (Field, 2013).

8.5. Results

8.5.1. Data screening

Prior to the inferential analysis, data screening procedures were undertaken to determine suitability for SEM analysis. No erroneous or invalid entries were identified across the data set. Missing values analysis (Little, 1988) indicated that the data were missing completely at random, [χ^2 (183) = 153.76, p = .843]. Missing values comprised no more than 1.2% of these data on the variables of interest, and were observed on the

[36] Version 3 of G*Power (used in Study 1, section 5.5.3.) currently has no facility to calculate power for SEM. However, Soper's (2016) online calculator is based on an algorithm by Westland (2010) who developed power analysis calculations for SEM.

PTGI-SF (*N* = 1), ERRI (*N* = 1) and PCOSES (*N* = 1) scales. There was no more than one missing item per case overall and no more than one missing items on any subscale. Missing values were replaced using Expectation-Maximisation techniques which are appropriate for situations with less than 5% missing data, as it provides better parameter estimates (Tabachnick & Fidell, 2013). Data were inspected for outliers and normality. Outliers were only found for the upper (*N* = 2) and lower (*N* = 6) ends of the present control variable distribution, however there were no extreme outliers and therefore all outliers were retained. In addition, no multivariate outliers were identified using Malahonbis and Cook's distance procedures which led to the variable being retained untransformed (Tabachnick & Fidell, 2013).

Shapiro-Wilk tests indicated that all variables aside from present control were found to be non-normal. Inspection of histograms and calculation of *Z* ratios revealed that skewness and kurtosis values for all variables (reported in Table 11) apart from event centrality fell within accepted thresholds for normality (Kline, 2016). The event centrality demonstrated a negative skew (*Z* = 5.64), however the variable was not transformed as it widely observed that adversarial events do become central to one's identity (Barton et al., 2013; Berntsen & Rubin, 2006; Boals et al., 2010). In respect of SEM assumptions (Byrne, 2016; Kline, 2016), deviation from linearity tests indicated that all relationships between variables were linear (all $p > .05$).

8.5.2. Preliminary analyses

Descriptive statistics and correlations among the CGAS model factors are presented in Table 11, *after* item removal in the SEM analysis.[37][38] Nearly all participants (98.0%) reported some growth on the PTGI-SF measure, indicated by a score of 1 and above. Tolerance and VIF values indicated no violations of multicollinearity (Tabachnick & Fidell, 2013). PTG was positively related to deliberate

[37] Descriptive statistics and correlations among variables *prior* to item removal are presented in Appendix XI for comparison.
[38] Additional correlational analysis including event characteristics was conducted in Appendix XII.

rumination, centrality, present control, and future control. PTS was positively related to event centrality, in the hypothesised direction, along with intrusive and deliberate rumination. Event centrality negatively correlated with present control. Both present and future control were positively associated with one another. While present control was negatively related to PTS, intrusive and deliberate rumination, future control was associated with PTG only. The target PTG and PTS variables were unrelated.

Table 11*. Descriptive data and correlations between variables in the final structural model after item removal (N = 250).*

Variable	*M*	*SD*	Min.	Max.	Skewness	Kurtosis	1	2	3	4	5	6	7
1. Event centrality	18.78	7.76	0	28	-.87	-.15	-						
2. Intrusive rumination	13.72	9.42	0	30	.10	-1.26	.58***	-					
3. Deliberate rumination	11.51	8.06	0	27	.19	-1.15	.48***	.62***	-				
4. Present control	6.28	2.76	0	12	-.07	-.32	-.35***	-.40***	-.11	-			
5. Future control	6.42	3.22	0	12	-.21	-.59	-.01	.00	.07	.22**	-		
6. Posttraumatic stress	8.11	5.57	0	18	.11	-1.22	.50***	.73***	.10	-.37***	.05	-	
7. Posttraumatic growth	19.95	9.77	0	40	-.10	-.78	.25***	.04	.20**	.20**	.24***	.02	-

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

8.5.3. Analysis of the measurement model

Baseline model (Model 1)

The model fit statistics for the baseline model (reported in Table 12 along with further models) revealed it to be a poor fit to the data, with CFI and TLI values below acceptable cut-offs (< .90). As part of the CFA, measurement properties were first examined with reliability and validity statistics, reported for the final model in Table 13. Inspection of the initial CFA in the baseline model (prior to any modifications) revealed the seven latent constructs to have excellent reliability, with all CR values exceeding .70. In respect of discriminant validity, the latent variables were well-represented by their indicators with AVE values above .50; however, the present control (AVE in baseline model = .38) and PTG (AVE in baseline model = .40) were poorly represented. However, other indicators suggested the latent variables were empirically distinct, with MSV values falling below those of the AVE for all seven latent variables and the square root of the AVE exceeding all correlations between latent variables.

Table 12. *Summary of fit indices for models tested.*

Model	df	χ^2	χ^2/df	AIC	CFI	TLI	SRMR	RMSEA	RMSEA 90% CI	
									Low	High
1. Initial baseline model	1415	2417.23***	1.71	2667.23	.89	.88	.08	.05	.05	.06
2. Low loading items removed	1112	1906.40***	1.71	2132.40	.90	.90	.08	.05	.05	.06
3. Appropriate error terms correlated	1106	1728.72***	1.56	1966.72	.93	.92	.07	.05	.05	.06
4. ERRI deliberate item removed	1059	1617.09***	1.53	1851.09	.93	.93	.07	.05	.04	.05
5. Intrusive PTSD-8 items removed	926	1431.17***	1.55	1649.17	.93	.93	.07	.05	.04	.05
6. Non-significant paths removed[1]	929	1424.73***	1.53	1646.57	.93	.93	.07	.05	.04	.05

Note. *** $p < .001$. [1] The PTSD-8 intrusive items were re-introduced in this model as paths remained unchanged.

Table 13. *CFA reliability and validity statistics for the seven latent variables in the final model.*

Variable	CR	AVE	MSV	√ AVE
1. Event centrality	.92	.61	.36	.78
2. Intrusive rumination	.96	.71	.70	.84
3. Deliberate rumination	.93	.58	.41	.76
4. Present control	.73	.43	.22	.65
5. Future control	.80	.50	.10	.71
6. Posttraumatic stress	.89	.58	.70	.76
7. Posttraumatic growth	.86	.45	.08	.67

Note. CR = composite reliability; AVE = average variance extracted; MSV = maximum shared variance; √ AVE = square root of the AVE.

Removal of low loading items (Model 2)

To explore the discrepant findings further, the indicator loadings of the present control and PTG latent variables were inspected to determine further improvements to the discriminant validity of the constructs. The PCOSES (Frazier et al., 2011) and PTGI-SF (Cann et al., 2010), which measure control perceptions and PTG respectively, are relatively new measures and limited validation studies exist, and so the convergent validity of the present control and PTG latent factors was improved by removing indicators of low loading (< .50). Four items (items 3, 7, 9 and 13) on the present control latent variable and two items on the PTG latent variable (items 4 and 8) were removed, leaving the latent factors with more than the required minimum of three indicators for SEM analyses.[39] The new AVE scores for the present control and PTG variables were still below but closer to the .05 cut-off; however, AVE is known a strictly conservative

[39] No obvious reason was found for the low loading items on the present control variable, although their wording may have been ambiguous to some participants (see Appendix X for PCOSES measure items). The two low loading items on the PTG measured spiritual or religious beliefs (see Appendix III for PTGI-SF measure items). This aspect of growth may be less relevant in the UK sample where this study took place, as literature suggests European samples are more secular (Calhoun et al., 2010).

measure of convergent validity (Malhotra & Dash, 2011). The remaining indicators for the seven latent variables strongly loaded on to their latent variables (all at $p < .001$), suggesting they were well-represented. Factor loadings of the indicators on the latent variables are presented separately in Table 14; the lowest factor loading was .60 on the present control, future control and PTG variables, and the highest was .91 on the intrusive rumination variable. The model now possessed acceptable reliability and validity. The removal of weak factor loadings in this second model greatly improved the CFI, TLI and SRMR values, while the χ^2/df and RMSEA values indicated an acceptable model.

Table 14. *CFA factor loadings in the final measurement model.*

Latent variable (and no. of indicators)	Item number	Factor loading
Event centrality (7)	1	.77
	2	.79
	3	.82
	4	.80
	5	.86
	6	.72
	7	.73
Intrusive rumination (10)	1	.85
	2	.89
	3	.87
	4	.91
	5	.91
	6	.77
	7	.79
	8	.86
	9	.77
	10	.85
Deliberate rumination (10)	1	.81
	2	.80
	3	.74
	4	.83
	5	.76
	7	.73
	8	.69
	9	.75
	10	.77
Present control (4)	2	.60
	5	.62
	11	.74
	16	.60
Future control (4)	6	.67
	10	.75
	14	.81
	17	.60
Posttraumatic growth (8)	1	.66
	2	.72
	3	.78
	5	.62
	6	.66
	7	.62
	9	.72
	10	.60
Posttraumatic stress (6)	1	.83
	3	.69
	4	.85
	5	.72
	6	.70
	8	.76

Note. Item numbers correspond to the original item number on the scale.

Appropriate error terms correlated (Model 3)

While the second model had improved fit statistics, further refinements were made to the measurement model to improve parsimony and model fit. Inspection of modification indices revealed that two pairs of error terms on the PTG latent construct could be correlated. The PTG items corresponding to the pairs of error terms were sufficiently close in meaning to explain the covariance, and thus correlating the terms was reasonable in keeping with the sample realisation interpretation of latent variables (Bollen, 2002). One pair of error terms consisted of two items reflecting 'personal strength', and a further pair corresponded to the theme of 'relating to others'. In addition, two error terms on the ERRI deliberate rumination subscale were correlated, as these both reflected intentional attempts to think about the event. Correlating the error terms revealed a model that more accurately reflected the data, with improved χ^2/df, AIC, CFI and TLI indices.

ERRI deliberate item removed (Model 4)

In the fourth model, modification indices for regression weights suggested that item six on the ERRI deliberate rumination subscale and item six on the CES centrality measure were predictive of one another. It is desirable to have 'clean' indicators in SEM, such that they should not predict items loading onto other latent variables within the model (Kline, 2016). Specifically, the modification indices showed that removing one of these indicators would reduce the chi-square and enhance the model fit, indicated by large values (28.24 for ERRI item six predicting CES item six, and 27.14 for CES item six predicting ERRI item six) for the modification index.[40] To simplify interpretation of the model, the item on the ERRI was removed as this demonstrated most improvement to model fit in respect of improved AIC, CFI, and RMSEA confidence intervals.

[40] There is no 'cut-off' point or threshold to consider the removal of items, although larger absolute modification index values are desirable as they improve model fit significantly. As per SEM guidelines (Kline, 2016), the removal of items should be determined on theoretical as well as statistical grounds.

Furthermore, the deliberate rumination latent variable had nine other indicators compared to six indicators for centrality.

8.5.4. Analysis of the structural model

The next step involved examining model fit indices once the theorised relationships between the latent variables had been specified. The following modifications were made to the structural model (i.e. the model with paths included between latent variables) to determine if further improvements could be made to model fit and parsimony.

Intrusive PTSD-8 items removed (Model 5)

As observed in other studies (Triplett et al., 2012), it was expected that the intrusive items on the PTSD-8 scale would be confounded with the ERRI intrusive subscale. The fifth model was run with only the avoidant and hyperarousal items on the PTSD-8. This model revealed similar fit indices to model four, with no significant changes to paths and relationships between latent variables.

Non-significant paths removed (Model 6)

In the sixth model, non-significant paths were removed between future control and event centrality, future control and PTS, and between deliberate rumination and PTG, in the interests of parsimony. Removal of these paths lowered the AIC index, indicating a better fitting model. Therefore, the sixth model was deemed the best fitting model, based upon the consideration of all fit indices. The χ^2/df, SRMR and RMSEA values indicated good model fit, while the AIC was improved compared to prior models. The CFI and TLI indices fell just below the .95 cut-off indicated by Hu and Bentler (1999), although they remained above the .90 value to be considered an acceptable model. In addition, minimal modifications were made to ensure model was as representative of the original data as possible. No further modifications were made to paths within the model as this would compromise the confirmatory (rather than exploratory) nature of SEM

(Byrne, 2016; Kline, 2016). The structural model is presented in Figure 8 with standardised co-efficients.

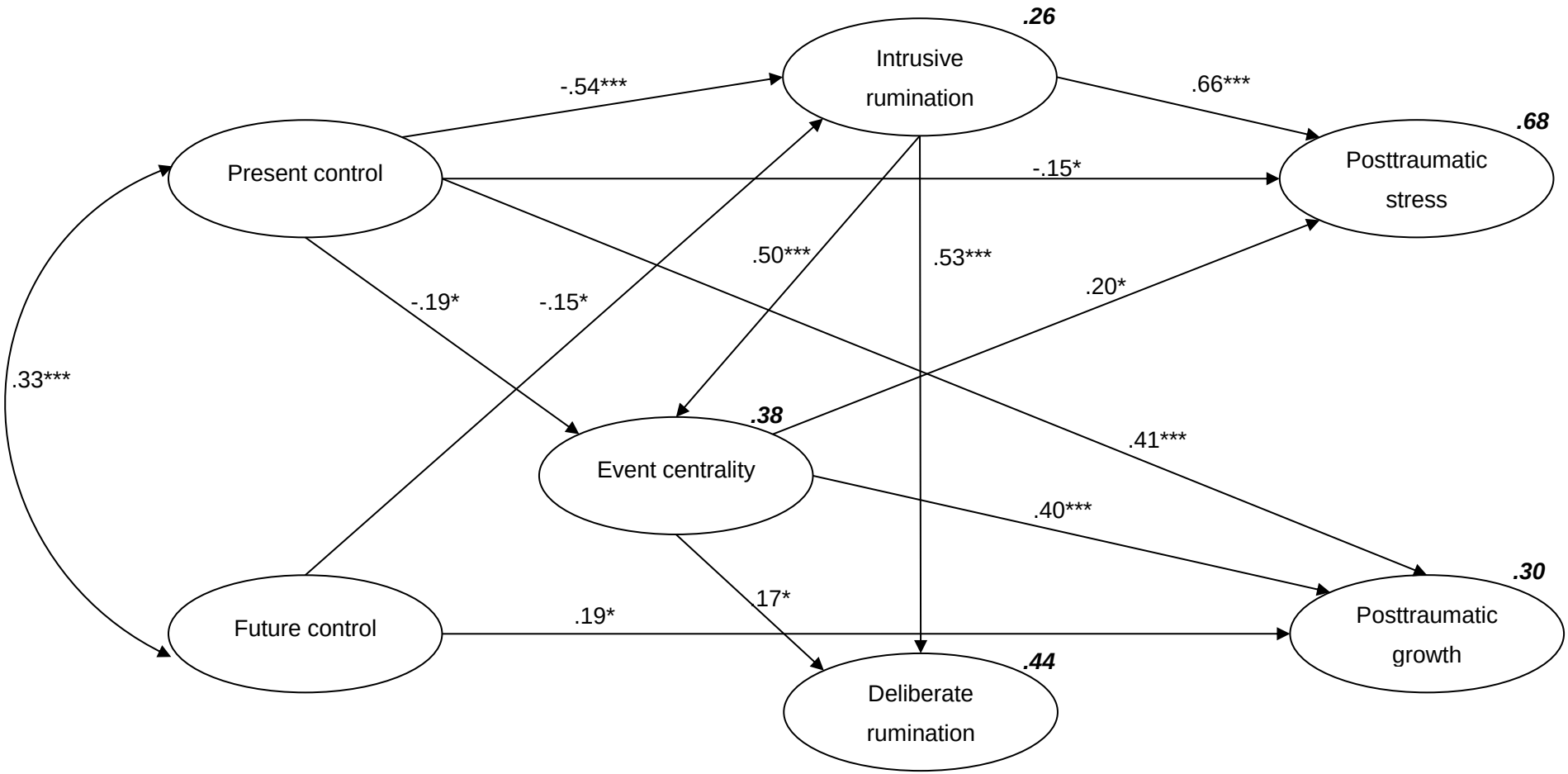

Figure 8. Standardised solution for the final CGAS model.

R^2 for each endogenous variable is shown in ***bold italics***. Observed variables, error terms and non-significant paths are not included for simplicity.

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

8.5.5. Relationships between latent variables in the final model

Following the aforementioned refinements to the model, steps were taken to understand the nature and strength of hypothesised relationships between latent variables in the structural model, presented in Figure 8. Overall, the final model accounted for 30% of the variance in PTG and 68% of the variance in PTS across the sample. In line with the hypothesis, both present and future control factors were positively related to one another. Present control positively predicted PTG and negatively predicted intrusive rumination and event centrality. Compared to present control, future control exerted weaker effects in the model. Consistent with the hypothesis, future control positively predicted PTG, and negatively predicted intrusive rumination. Intrusive rumination was a positive predictor of PTS and deliberate rumination; however, deliberate rumination did not predict PTG as expected. In line with the hypotheses, event centrality was a positive predictor of PTG, PTS and deliberate rumination, and was strongly and positively predicted by intrusive rumination and negatively predicted by present control.

8.5.6. Mediation analyses

Analysis of indirect effects using the Preacher and Hayes (2008) method utilised in Study 1 (section 5.18.3.) indicated that intrusive rumination mediated the negative association between present control and event centrality (ab_{cs} = -.27; BCa CI: -.40, -.18), and the negative relationship between present control and PTS (ab_{cs} = -.37; BCa CI: -.52, -.26). Event centrality also mediated the positive relationship between intrusive and deliberate rumination (ab_{cs} = .10; BCa CI: .04, .19) and the positive association between intrusive rumination and PTS (ab_{cs} = .04; BCa CI: .01, .11). All mediation analyses therefore demonstrated small to large indirect effects.

8.6. Discussion

This chapter presents the CGAS model of pathways towards growth and distress in its first developmental phase. While rumination, centrality and control are key determinants of psychological adjustment after adversity (Frazier & Caston, 2015; Groleau et al., 2013; Morris & Shakespeare-Finch, 2011), this study differs from existing models by drawing these concepts together into one framework. Notably, the model identified the most appropriate relationships between cognitive processing variables. In line with other research (Dekel et al., 2011), the study suggested that PTG and PTS are both possible outcomes after adversity that arise through distinct processes. The overlap in the determinants of adjustment indicates that some degree of distress is a necessary part of the process of PTG, but the non-significant correlation between PTG and PTS reveals that an absence of distress does not necessarily equate to higher growth, or vice-versa (Tedeschi & Calhoun, 2004).

The findings offer support to elements of the FDM and ACPM. Increased intrusive ruminations were associated with heightened distress, even after controlling for intrusive aspects of PTS. These intrusive thoughts preceded more deliberate attempts to contemplate the wider significance of the event, consistent with the idea that the content of the rumination can determine psychological outcomes (Stockton et al., 2011). Contrary to expectations, deliberate rumination was positively associated with, but did not predict, PTG. It is acknowledged that PTG is a function of the degree to which the survivor is cognitively engaged with the event (Tedeschi & Calhoun, 2004). Research suggests that deliberate rumination alone only serves to reassess the event, while positive reappraisal involves a reorientation necessary for growth to occur (Cárdenas et al., 2016). Therefore, some survivors in this study were possibly able to contemplate some good in the event, but had not yet experienced positive shifts in world view that enabled the reconstruction of new meaning.

Findings confirmed that event centrality robustly predicted growth and distress (Allbaugh, Wright, & Folger, 2016; Groleau et al., 2013). Notably, the CGAS model went further to observe the ability of centrality to mediate between types of rumination, and

between intrusive rumination and PTS. This finding is supported in recent literature that views centrality as a facilitator of other cognitive processes after adversity, in part due to the increased accessibility of salient memories (Fitzgerald et al., 2016; Lancaster et al., 2015). Centralised events create internal, stable and global attributions, enabling the survivor to believe their adversity is related to their own personal characteristics, leading to distress (Berntsen & Rubin, 2006). The current research, however, suggests that centrality can have adaptive effects on psychological adjustment, by motivating more constructive forms of rumination and providing a context from which control perceptions are increased. This is important as literature (Ehlers & Clark, 2000) has traditionally viewed intrusions as reflecting an inability to process the adverse experience, thus perpetuating PTS symptoms, rather than an event that has become overly central to one's identity which may lead to PTG.

A unique contribution of the CGAS model to the understanding of cognitive processing after adversity was the inclusion of control perceptions that are currently lacking in other PTS and PTG models (e.g. Ehlers & Clark, 2000; Tedeschi & Calhoun, 2004; Joseph et al., 2012). Generally, present control perceptions were more strongly related to other modelled variables than future control. Indeed, of all three temporal domains, present control is most closely associated with adjustment (Frazier et al., 2011), suggesting that survivors were primarily concerned with their current response to the event, rather than taking preventative steps to avoid reoccurrence. However, both present and future control positively predicted PTG, consistent with a forward-looking orientation that is typical of growth (Frazier & Caston, 2015). Positive transformation is therefore experienced when the survivor regains control over their recovery, associated with increased mastery and self-efficacy within the growth process (Tedeschi & Calhoun, 2004).

8.6.1. Strengths and limitations

While the findings contribute to the understanding of cognitive processing after adversity, the study is not without limitation. Even though SEM has statistical advantages, the cross-sectional design means that true causal directionality cannot be determined. Additionally, it is recognised that not all theoretically viable paths were estimated, although the model was parsimonious and aligned with SEM principles (Kline, 2016). Finally, while fit indices exceeded those in other published studies (e.g. Triplett et al., 2012), the CFI and TLI values lacked robustness relative to existing criteria (Hu & Bentler, 1999), thus caution is required when interpreting the findings. Nevertheless, acceptable variance in PTG and PTS was revealed, considering the diverse population and types of events included.

8.6.2. Implications

The CGAS model assumes that individual differences in cognitions are crucial to positive development following negative life events. It was the first model to unify rumination, event centrality, and control perceptions into a single framework to explain the psychological mechanisms that lead to PTG and PTS. This was achieved using SEM techniques that go beyond the methodologies used in prior research (Lancaster et al., 2015; Triplett et al., 2012). The findings suggest that the FDM and ACPM may not capture all cognitive factors that are critical to growth and distress. As a relatively new concept, little was known about event centrality, while control perceptions were poorly integrated into the PTG literature. However, the CGAS model found that centrality and control, along with rumination, had good explanatory power in terms of disentangling the complex mechanisms that may determine why some people report more (or less) growth and distress than others. Furthermore, the CGAS model is advantageous in its applicability to a diverse range of adverse events. Existing models normally focus on one specific type of adversity, such as cognitive processing and PTG following cancer (e.g. Morris & Shakespeare-Finch, 2011), or are limited by their reliance on undergraduate

samples (Lancaster et al., 2015; Triplett et al., 2012). Study 3 extends existing findings to people exposed to different types of adverse events, yet confirm the conclusions of other recent PTG and PTS studies (e.g. Groleau et al., 2013; Lancaster et al., 2015; Triplett et al., 2012), thus providing rigor to the findings.

In addition to theoretical contributions, the CGAS model can result in important therapeutic implications. It encourages practitioners to recognise that adjustment after adversity is neither solely positive nor negative, and that rumination, event centrality and control perceptions, are additional factors to consider in survivors of multiple adverse events. The CGAS model encourages practitioners to consider the positive and negative aspects of rumination, event centrality and perceived control beyond any existing framework, and their ability to enhance people's PTG or lead to distress. On this basis, it may be of value to target specific cognitions that enhance control perceptions as part of the rebuilding of the assumptive world (Janoff-Bulman, 1992) and guide survivors towards more constructive ruminative processes that help them to understanding the meaning behind their experiences. It may also be beneficial for practitioners to be aware of central event valence in the narratives of survivors, which has the potential to lead to both growthful and distressing outcomes.

8.7. Chapter summary

The CGAS model provides greater understanding as to the pathways and cognitive processes involved in the development of PTG and PTS. Study 3 further identifies unique relationships between control perceptions, ruminative types and event centrality that lead to growth and which are poorly described in existing PTG theory and models. The study findings emphasise that cognitive responses to adversity are complex, entailing both positive and negative sequelae that are differentially related to growth and distress.

CHAPTER NINE: Study 4: Trajectories of posttraumatic growth – A longitudinal investigation

9.1. Chapter introduction

Study 4 will extend the cross-sectional findings of studies 1, 2 and 3 by exploring the factors that influence how PTG changes over time. A brief review of the longitudinal PTG literature is presented before the empirical studies. Study 4 is comprised of two separate but related studies which both aim to identify factors that can influence changes in PTG over time. Study 4a will examine whether the characteristics of the adverse event and experiencing further adverse events can determine the amount of PTG reported, alongside intrusive thoughts which have demonstrated robust relationships with growth previously in this thesis (see studies 1b and 3). Next, Study 4b will further explore whether people report different levels of PTG over time, and assess whether an individual's disclosures at an earlier timepoint can indicate the quality of PTG experienced over an 18-month period.

Study 4a: The impact of event characteristics and intrusive thoughts on posttraumatic growth over time

9.2. Longitudinal research on posttraumatic growth

PTG is recognised to be a temporal construct, which is assumed to change over time (Tedeschi & Calhoun, 2004), however, this is not always acknowledged or measured appropriately in existing literature. Generally, there are scant longitudinal investigations of PTG. The majority of existing literature is based on cross-sectional studies which provide only a brief snapshot of growth at any given point, and make it difficult to causally infer, with confidence, that the adverse event was indeed the catalyst for positive change. According to Calhoun and Tedeschi (2004), PTG is argued to be a slow and gradual process, although they do not develop this argument further. In fact, the brief time-frames used to assess growth in some longitudinal studies (e.g. six months, Kleim & Ehlers, 2009; three months, Salsman et al., 2009) mean that conclusions are tentative at best. The limited longitudinal investigations therefore inhibit an understanding of the factors that can influence long-term changes in growth. As such, there is a need for more research on growth trajectories over a longer timeframe.

9.2.1. Temporal relationships between posttraumatic growth and distress

As already outlined earlier in this thesis (see Chapter 2, section 2.7.2.), a central concern within the literature is the association between growth and distress, both of which represent tangible outcomes following adverse life events. A small number of longitudinal studies have empirically tested this claim, reporting mixed results. Earlier research tends to find that growth can predict subsequent PTS, as observed among breast cancer survivors five to eight years post-surgery (Lechner et al., 2006) and soldiers returning from Iraq five and 15 months after their deployment (Engelhard, Lommen, & Sijbrandij, 2015). However, some longitudinal studies of cancer survivors (Salsman et al., 2009; Sears et al., 2003) find that PTS symptoms are unrelated to

subsequent PTG a year after diagnosis, against the assumptions of the FDM and ACPM. The mixed findings may be explained by the use of unstandardised measures in some studies (Frazier et al., 2001; Salsman et al., 2009; Sears et al., 2003) Furthermore, even though the FDM and ACPM both suggest that some degree of distress is necessary in order to experience growth (Calhoun & Tedeschi, 2004; Joseph et al., 2012), this theoretical assumption is surprisingly rarely tested, with the exception of some recent studies. Dekel and colleagues (2012) found that Israeli prisoners of war with PTSD reported higher PTG at 12 and 17 years after the initial baseline assessment than those without PTSD. In addition, hurricane survivors reporting more PTS symptoms one and three years after the event also reported more growth than those who with fewer PTS symptoms (Lowe et al., 2013). Meanwhile, Blix and colleagues (2016) reported more nuanced findings in their study of 240 people exposed to a terrorist bombing. While higher levels of PTS were associated with more PTG 22 months after the attack, the relationship between PTS and PTG declined between 10 and 22 months after the bombing, and was non-significant thereafter. Conflicting findings between PTS and PTG may be explained by non-linear relationships that have been explored in a few cross-sectional studies (see Chapter 2, section 2.7.2 for discussion), but this has not yet been extended to longitudinal research. Given these inconsistences in existing research, further longitudinal investigations are needed to establish the temporal nature of the relationship between growth and distress.

9.2.2. Intrusive thoughts and long-term posttraumatic growth

Of all factors associated with PTG (see Chapter 2, section 2.7. and Chapter 7 for discussion of factors) intrusive thoughts are thought to most accurately represent cognitive processing of the adverse event (Cann et al., 2011; Joseph et al., 2012; Park, 2010; Tedeschi & Calhoun, 2004). Intrusions are highlighted in the FDM and ACPM as the central catalyst of psychological efforts to understand the implications of adversity (see Study 1b, section 5.15.1.1.), and have demonstrated the largest effect sizes as correlates of PTG compared to psychosocial factors in other research (Helgeson et al.,

2006). This thesis has so far shown that intrusive thoughts were the strongest mediating factor between adverse event characteristics and PTG, demonstrated by the largest standardised effect sizes in Study 1 (see Study 1, section 5.18.2.), and as a mediator of other cognitive processes conducive of growth in Study 3 (see Study 3, section 8.5.6.). Thus, intrusive thoughts are not only critical to the triggering of subsequent cognitive processes, but in the maintenance of distress and other efforts necessary for PTG to occur. While intrusive thoughts may be an indicator of the cognitive processing needed to experience PTG, this is not routinely explored in existing PTG longitudinal research. Studies tend to focus on PTSD symptoms more generally (Dekel et al., 2012; Lowe et al., 2013), consistent with conceptualisations of PTS as a marker of distress (see Chapter 7, section 7.3.), which potentially mask the effects of intrusive thoughts. Understanding temporal relationships between PTG and intrusive thoughts may inform more holistic clinical efforts to help survivors recover after adverse events.

9.2.3. Event characteristics on long-term posttraumatic growth

9.2.3.1. Impact of multiple event types on long-term posttraumatic growth

While the impact of multiple types of events on the experience of PTG was explored in studies 1 and 2, and some limited cross-sectional research already discussed (Kira et al., 2013; Kılıç et al., 2016; see Chapter 2, see section 2.7.3.2.), there are equally few longitudinal investigations that control for multiple adverse exposures. Longitudinal studies are needed as they can establish how PTG may change not only after one adverse event, but subsequent events a person may experience. The limited longitudinal studies that account for multiple exposure tend to report mixed findings, such that PTG increases (Kunst et al., 2010a) or remains constant regardless of multiple events (Marshall, Frazier, Frankfurt, & Kuijer, 2015). This suggests that overcoming multiple types of events may embolden some individuals to learn life lessons that prepare them for the future. These findings are not addressed by the FDM, which posits that growth may occur after a period of 'reflection' following a single adverse event only (Tedeschi &

Calhoun, 2004). This model therefore does not offer any insight into PTG following multiple types of events. However, other literature (Valdez & Lilly, 2015) argues that the experience of multiple types of events should theoretically inhibit cognitive processing, because attempts to accommodate new information about an adverse event are thwarted by the experience of further adverse events. In their study of survivors of intimate partner violence, Valedz and Lilly (2015) found that those repeatedly exposed to the same type of violence experienced less growth than those who were not revictimised in the one-year study period. This suggests that experiencing subsequent adverse events may inhibit or 'reset' PTG processes because survivors are not able to reconstruct their world views, although the study did not specifically address PTG following *different* types of events. However, survivors of the 2004 Asian tsunami (Boxing Day tsunami) reported higher PTG if they experienced a combination of bereavements, illness or injury, and life threat in the six years following the disaster, compared to those who experienced one of these events alone (Michélsen, Therup-Svedenlöf, Backheden, & Schulman, 2017). While the PTG literature cannot fully explain how growth changes following different types of events, PTS research has shown that intrusive thoughts can increase following multiple exposures to different adverse events (Follette et al., 1996; Kilpatrick et al., 2013). This finding implies intrusions can play a role in the aftermath of multiple types of adversity (and the experience of further events), although it is unclear whether intrusive thoughts in this context are an indicator of cognitive processing of the event, a marker of distress, or both.

9.2.3.2. Impact of event type on long-term posttraumatic growth

Longitudinal research that explores how the type of adversity can influence longer-term changes in PTG are extremely limited. The direction of the findings in the available studies suggest that those with interpersonal events can report PTG, in line with cross-sectional literature (see Chapter 2, section 2.7.3.3.). For example, 87.0% of intimate partner violence survivors in one study reported increased PTG over a one-year period if they had not been revictimised (Valdez & Lilly, 2015). Growth in a sample of

assault survivors was lower at around 60.0%, six months after the incident (Kleim & Ehlers, 2009), although they did not control for exposure to other adverse events during the study period. This suggests that interpersonal events may be the source of challenges to individual's assumptive world that motivates PTG in some survivors, and inhibits growth in others. However, the role of intrusive thoughts was not specifically assessed in any of the aforementioned investigations, which could provide an indicator of the perceived severity of the incident that explains discrepancies among studies. In addition, the aforementioned research is limited by small sample sizes (e.g. 23 women in the Valdez and Lilly (2015) study), hence more research with larger samples is needed. Moreover, these studies largely focus on people exposed to interpersonal events, which means it is not possible to directly assess whether long-term growth differs from people experiencing non-interpersonal events. Thus, current research cannot yet fully explain why growth over time differs according to the type of events experienced.

9.2.4. Quality of posttraumatic growth over time

Another aspect of empirical inquiry lacking in the longitudinal literature is the *quality* of growth experienced over time. As previously noted (see Chapter 2, section 2.6.2.1.), PTG may be characterised as a coping strategy and/or reflect actual positive change. However, the extent to which the quality of growth changes over time is relatively unknown, as existing studies (e.g. Danhauer et al., 2015; Michélsen et al., 2017) do not discuss the quality of PTG as a potential explanation for changes in growth over time. The JFM argues that growth in the short-term may reflect a coping strategy in response to distress, while PTG in the longer-term may indicate *actual* positive change (Zoellner & Maercker, 2006). Indeed, some studies have found that long-term changes in PTG might reflect the quality of growth experienced. Marshall and colleagues (2015) reported that PTG was stable in their earthquake survivor sample both three and 12 months after their baseline measurement, despite subsequent adverse events occurring during the study period. This finding contradicts the FDM assumption that growth should increase over time, ideally reflecting the positive improvements in well-being gained from the

adverse experience (Tedeschi & Calhoun, 2004). Rather, stable PTG over time may provide a short-term defence mechanism that allows the survivor to detach from the psychological pain of their experiences (Zoellner & Maercker, 2006).

Interestingly, and as previously noted (see section 9.2.1.), some research has found that PTG is associated with more distress over time (Engelhard et al., 2015; Lechner et al., 2006). For example, a study of 1,613 civilians exposed to war and conflict (Hall et al., 2015) revealed that PTG can increase PTS symptoms over a 12-month period, but PTG in itself does not lead to reduced PTS symptom severity. Similarly, Lahav, Solmon and Levin (2016) examined the relationship between growth and distress in wives of ex-prisoners of war 30 and 38 years after the Yom Kippur War. They found that increased growth was related to more distress and poorer perceived health during the eight-year assessment period. Together, these findings appear to support an interpretation that perceived long-term PTG with co-occurring distress may reflect a coping strategy, similar to repression or denial, as outlined in the JFM (Zoellner & Maercker, 2006). According to this argument, if PTG were to represent actual changes in well-being, it would be expected to lead to a reduction in distress over time (Frazier et al., 2009). Therefore, temporal relationships between growth and distress may offer some insight into the quality or nature of growth experienced.

As previously noted (sections 9.2.3.1. and 9.2.3.2.), longitudinal PTG studies that control for the number or type of subsequent exposures with adverse events are few. In doing so, it is unclear how the quality of growth changes as a function of experiencing further adverse events. Some researchers (Lahav et al., 2016) argue that PTG in protracted situations where multiple adversities may occur could reflect a coping strategy. In this situation, survivors may engage in an intense defensive effort to detach themselves from the pain of their emotional experiences, in an attempt to minimise cognitive dissonance (Blix et al., 2013). Cognitive dissonance refers to situations involving conflicting attitudes, beliefs and behaviours which can lead to feelings of discomfort (Festinger, 1962). According to this explanation, people who experience

multiple events may face great challenges in attempting to restore the sense of meaning from adverse events. As a result, survivors may compensate for the negative effects of adversity by perceiving PTG. These explanations require further empirical support from the growth literature, and so research is needed to examine how multiple types of events (and further adverse events) can impact on the quality of PTG.

9.3. Aims of study

Study 4a will draw upon advanced statistical methods in order to explore the relationship between growth and intrusive thoughts over time. Extant methods for longitudinal analysis primarily rely on traditional generalised linear methods such as ANOVA, which are particularly limited with repeat data.[41] Therefore, more sophisticated techniques, such as growth curve modelling (GCM; see section 9.4.3. for discussion[42]), are suggested as a powerful alternative to assess individual trends over time (Curran, Obeidat, & Losardo, 2010; Shek & Ma, 2011). Such techniques can model trajectories of PTG both between and within individuals over time, whilst also accounting for the influence of covariates (i.e. event characteristics and intrusive thoughts) on these trajectories (Hesser, 2015). The study is therefore novel in its application of GCM techniques within the PTG literature to progress the study of long-term positive changes.

The overall purpose of Study 4a is to examine the extent to which event characteristics (interpersonal event, number of event types, exposure to further events) and intrusive thoughts can determine the level of PTG reported over time. Due to lack of literature and mixed findings regarding the impact of event characteristics on longitudinal PTG trajectories, no directional hypotheses were made in relation to event characteristics. However, as studies 1, 2 and 3 showed that event characteristics

[41] ANOVA approaches only estimate fixed effects and assume homogeneity of variance in the population, unlike GCM which models fixed and random effects (DeLucia & Pitts, 2006).
[42] GCM is a form of multilevel modelling, also known as *hierarchical linear modelling*, *linear mixed effects modelling*, *mixed effects modelling* or *random coefficients modelling* in the literature (Hesser, 2015).

demonstrated weaker effects on PTG compared to intrusive thoughts, it was expected that intrusions would exert greater effects on growth over time.

9.4. Method

9.4.1. Participants and procedure

Two-hundred and sixty-eight participants from Study 1 completed measures of PTG, PTS and adverse event history that provided Time 1 (T1) data. Of these participants, 102 (38.1%) declined to engage with further data collection after T1, and thus the remaining 166 (61.9%) respondents who agreed to be contacted were invited to provide follow-up data at Time 2 (T2) six months' later. Of these 166, 73 participants from T1 provided data at T2, representing a response rate of 27.2% (43.9%; excluding those who originally declined to be contacted after T1).[43] After six months at Time 3 (T3), the 73 participants were again invited to provide data for analysis. Fifty of these participants volunteered data while the remainder did not reply, giving a response rate of 68.5%. Six months later, attempts were made to contact the 50 participants at T3 to provide data at Time 4 (T4). Forty-two participants completed the measures of interest at T4, representing 84% of the T3 and 15.7% of the original T1 sample at the final (T4) follow-up. T1 to T4 thus spanned 18 months. The representativeness of the sample at each time point is examined in section 9.5.3. The process of participants through the longitudinal study is summarised in Figure 9*,* with demographic information and adverse event history for the sample at each time point presented in Table 15.

[43] The remaining participants did not complete the study and were not required to provide a reason for their decision.

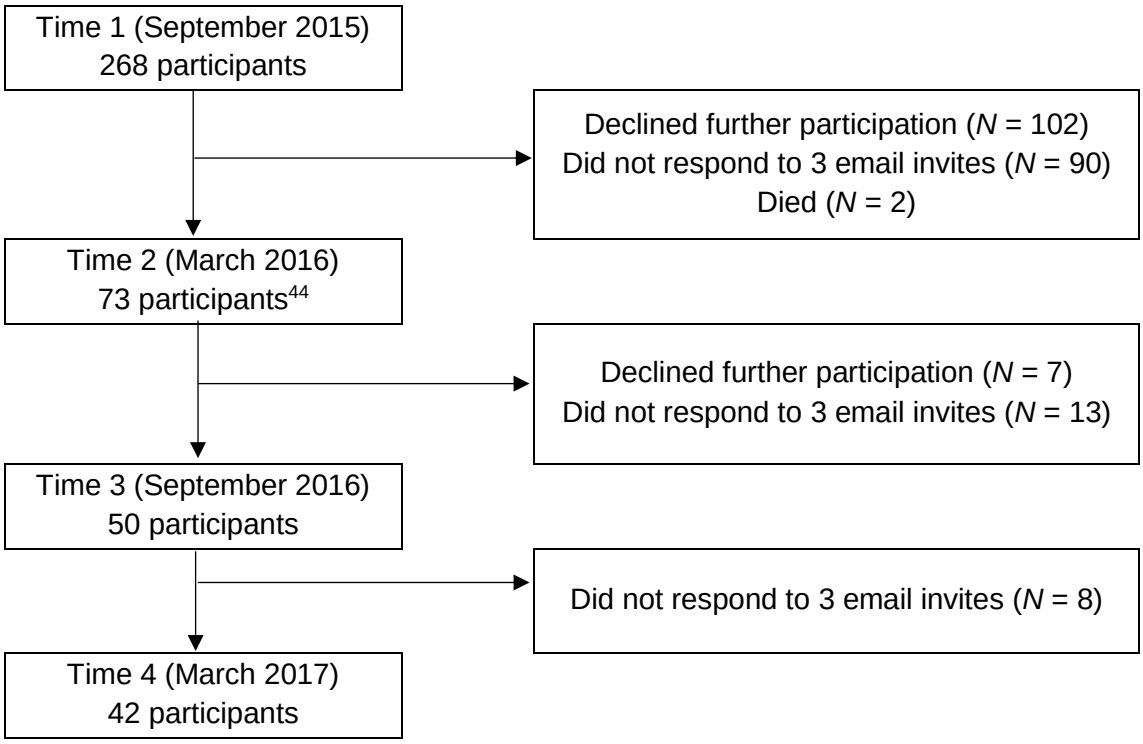

Figure 9. Flow of participants through Study 4a.

It was noted that between 12.0% and 18.7% of events across the four time points within Table 15 were marked as 'other events' by participants on the PDS checklist. Although most participants (77.1%) did not disclose the nature of events on the questionnaire, the remainder indicated suicide attempts, drowning, homelessness, bullying at work, harassment and children being removed from their care as adverse events.

[44] 26 of these participants also gave interviews for Study 2.

Table 15. *Sample characteristics and adverse event exposure across four time points.*

	Time 1 (*N* = 268)			Time 2 (*N* = 73)			Time 3 (*N* = 50)			Time 4 (*N* = 42)		
Characteristic	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Age (years)	33.81	12.54	16 – 69	34.80	12.92	16 – 68	35.40	13.16	16 – 68	36.02	13.45	17 – 69
		N	%		*N*	%		*N*	%		*N*	%
Female gender		214	79.9		55	75.3		36	72.0		30	71.4
Marital status												
Single		90	33.6		40	54.8		18	36.0		17	40.5
Dating/Cohabiting		91	34.0		26	35.6		19	38.0		14	33.4
Married		58	21.6		8	11.0		5	10.0		6	14.3
Separated/Widowed		29	10.8		8	11.0		7	14.0		5	11.9
Heterosexual orientation		227	84.7		59	80.8		38	76.0		31	73.8
White ethnicity		222	83.5		64	87.7		38	76.0		32	76.2
Religious belief		109	40.7		46	63.0		27	54.0		24	57.1
Disabled		45	16.8		18	25.0		12	24.0		2	4.8
Experienced event		268	100.0		40	54.8		17	34.0		20	47.6
Event type												
Accident		131	48.9		10	13.7		7	14.0		1	2.4
Natural disaster		26	9.7		2	2.7		0	0.0		1	2.4
Serious attack/threat		138	51.2		8	11.0		9	18.0		5	11.9
Sexual assault/rape		76	28.4		1	1.4		3	6.0		1	2.4
Child sexual abuse		92	34.3		0	0.0		0	0.0		0	0.0
Military conflict		15	5.6		2	2.7		1	2.0		0	0.0
Serious illness		73	27.2		8	11.0		5	10.0		7	16.7
Bereavement		142	53.0		3	4.1		4	8.0		7	16.7
Neglect		87	32.5		4	5.5		3	6.0		3	7.1
Other event		50	18.7		10	13.7		6	12.0		7	16.7

9.4.2. Measures

Adverse event history. The 12-item checklist from the PDS (Foa et al., 1997; see Study 1, section 5.5.2. for description) used in prior studies within this thesis recorded prior history of adverse events. At T1, adverse event history was obtained for all participants (see Study 1, section 5.5.2.), including event types and frequency. At T2, T3 and T4, the wording of the measure was adapted to capture further adversarial exposures in the past six months since the last time point, and the nature of those events (see Appendix XIII). Therefore, the adapted PDS read: "Have you experienced a traumatic event within the past six months?" and if so, invited participants to record the number of events in the past six months.

Intrusive thoughts. The PTSD-8 (Hansen et al., 2010; see Study 1, section 5.5.2. for description), used in prior studies throughout this thesis, was employed to measure eight symptoms of PTS. Intrusive thoughts were measured at T1, T3 and T4,[45] using the four items that corresponded to the intrusive subscale of the measure. The intrusive subscale demonstrated high internal consistency at all time points (T1 α = .91; T3 α = .94; T4 α = .95).

Posttraumatic growth. The PTGI-SF (Cann et al., 2010; see Study 1, section 5.5.2. for description) is a measure of 10 perceived positive changes after adverse events. The PTGI-SF demonstrated good to high reliability at the four time points (T1 α = .91; T2 α = .88; T3 α = .88; T4 α = .94).

9.4.3. Data analysis

[45] PTS symptoms were not measured at T2 for three reasons; first, participants opted to take part in a one-hour interview and it was thus felt that completing additional questionnaires would place greater demands on their time. Second, the interviews were framed as exploring positive changes, and so the addition of PTS measure was not felt appropriate. Third, for GCM with few time points, researchers must aim for a parsimonious model and so it not always necessary to capture the maximum amount of measures at each time point, thus reducing model complexity (MacCallum & Kim, 2015).

Participation attrition or dropout in longitudinal PTG studies is common (e.g. Dekel et al., 2012; Hall, et al., 2015), and may occur for reasons such as death, change of contact details, demands on time or simple refusal to participate any further (Galea & Tracy, 2007). While participant attrition in itself is not an indicator of bias, it is necessary to establish the representativeness of the remaining sample to reveal any differences between those who did and did not dropout of the study (Galea & Tracy, 2007).

To address the research questions of interest, a series of logistic regressions were first conducted to establish whether participants who dropped out differed on any demographic or psychological characteristics which may bias the study findings. Logistic regression is used to predict discrete outcomes from a set of continuous or categorical variables. It is advantageous over similar methods such as discriminant function analysis, in that it does not assume normality of predictors, equal variances within a group or any linear relationship between the predictors and dependent variable (Tabachnick & Fidell, 2013). However, it does assume a linear relationship between any continuous predictor and the logit of the outcome variable (Field, 2013).

The fit of logistic model to the data can be evaluated using the Hosmer and Lemeshow (H-L) test, where non-significant *p* values are desirable (Tabachnick & Fidell, 2013). Unlike linear regression, there is no analogous R^2 value that explains the variance in the dependent variable accounted for by the predictors, and as such as any use of pseudo-R^2 is currently discouraged (Tabachnick & Fidell, 2013). However, Hosmer, Lemeshow and Sturdivant (2013) recommend the R_L^2 statistic which measures how much the badness of fit improves as a result of including predictors into the model. Values closer to one indicate the model predicts the outcome variable perfectly, while values closer to zero suggest the predictors are very poor at predicting the outcome. Finally, logistic regression provides odds ratio (OR) statistics and associated 95% CIs; OR values greater than one indicate that the outcome is more likely to occur when the predictor increases, while OR values below one suggest the outcome is less likely (Field,

2013). Significant predictors should also have lower and upper values for the 95% CI which do not include zero.

Growth curve modelling

Following the logistic regression, growth curve modelling (GCM) was employed to determine trajectories of PTG in participants over an 18-month period from September 2015 to March 2017. GCM approaches can be used with repeated measures data to assess change over time, and are extremely flexible with longitudinal data sets which are often characterised by missing data, unequal spacing of intervals between time points and non-normal data (Tabachnick & Fidell, 2013). It is therefore possible to model a growth curve based on the original sample regardless of participant dropout.[46] GCM also has additional advantages in detecting meaningful differences with small to moderate sample sizes as low as 50 participants, and the ability to model non-linear trajectories with three or more time points (Hesser, 2015). While GCM takes into account individual variability, parsimonious models are preferred to explain trends (Tabachnick & Fidell, 2013).

GCM is an advanced statistical method with numerous terminology associated with the technique. As a form of multilevel model, GCM assumes that data is organised hierarchically in the real-world. For example, responses to a questionnaire (*level one*) are nested within the individual (*level two*; Field, 2013). The level one model describes variation within the individual, including their initial measure at the first-time point (*intercept*) and rate of change over time (*slope*). The level two model explores how the rate of change varies across individuals. In GCM, the intercept and/or slope are either *fixed* or *random* (Field, 2013). A *fixed* intercept and/or slope means that the initial status and rates of change for individuals are the same and not allowed to vary, unlike a *random* intercept and/or slope.

[46] If the data were analysed using ANOVA approaches, listwise deletion procedures would mean only complete data for 42 participants could be used.

GCM, as a form of multilevel model, includes the measurement of *fixed* and *random effects*, although clear definitions are hard to find due to varying interpretations in the literature (Field, 2013). Generally, and for the purpose of this analysis, *fixed effects* refer to the conditions in the experiment that a researcher is primarily interested in; for example, explanatory variables that explain any given effect in the sample. This means that the results can only be generalised to situations outside of the experiment where similar levels of the independent variable exist. *Random effects*[47] are used if the variable is argued to represent a small subset of all possible values that exist, such as a sample of people from a larger population. This allows the researcher to generalise beyond the conditions within the study, but will usually lead to larger standard errors (*SE*) which are less powerful. The modelling of fixed and random effects is particularly advantageous over traditional ANOVA-based approaches, which only estimate fixed effects and assume homogeneity of variance in the population (DeLucia & Pitts, 2006).

In accordance with other literature (DeLucia & Pitts, 2006), the GCM analysis followed three phases: (1) preliminary examination of raw PTG growth trajectories for randomly selected participants; (2) identifying an appropriate specification for the model (e.g. linear, quadratic trend, and whether to fix slopes and intercepts or allow them to randomly vary); and (3) adding covariates or predictors to the model that might explain variability in PTG trajectories. Alongside this, model fit will be evaluated by comparing the difference in the deviance (also known as -2 log likelihood; -2LL). *Deviance* is a measure of the 'badness of fit' and follows a chi-square distribution, and thus lower values of -2LL are desirable (Tabachnick & Fidell, 2013). AIC and Bayesian Information Criterion (BIC) values are also informative when comparing subsequent models, as they account for model complexity and sample size; lower values of AIC and BIC are preferred (Tabachnick & Fidell, 2013). Finally, the amount of variance in the dependent variable explained by the models will be calculated using the intraclass correlation coefficient (ICC), while the proportion of reduction in variance (PRV) assesses how much of the

[47] Also known as *variance components* in the literature (Peugh & Enders, 2005).

variance has been accounted for by the addition of new predictors (Peugh, 2010; Shek & Ma, 2011). Finally, as the study is exploratory in nature, no alpha corrections were applied (Field, 2013).

9.5. Results

9.5.1. Data screening of T2, T3 and T4 data

Data screening procedures had already been undertaken for data at T1 and are not repeated here (see Study 1, section 5.6.1.). However, T2 (number of event types, PTG), T3 (number of event types, intrusive thoughts, PTG) and T4 data (number of event types, intrusive thoughts, PTG) was examined for deviations from normality, data entry errors, missing values and outliers. Shapiro-Wilk tests indicated that T2, T3 and T4 PTG were all normally distributed (all $p \geq .124$). The T2, T3 and T4 number of event types variables were all significantly negatively skewed (all $p < .05$). The T3 and T4 PTS intrusions variables were also non-normal, demonstrating positive skew (all $p < .001$). Inspection of the data suggested that 44 people experienced another event at T2, T3 or T4, while six of the 42 individuals at T4 reported events at every time point, which may account for such a discrepancy. The variables were not transformed in order to maintain the integrity of the data (Tabachnick & Fidell, 2013).

No missing data or data entry errors were identified at T2, T3 or T4 on the variables of interest. While GCM can handle missing data, it is important that the data are at least missing completely at random for the longitudinal measures of interest (Tabachnick & Fidell, 2013). Tests of the variables using missing values analysis (Little, 1988) suggested that values were missing completely at random [χ^2 (37) = 35.70, p = .530]. Using box and whisker plots, no outliers were detected on any T2 variables, or the T3 and T4 PTS intrusions and PTG variables. Six univariate outliers were detected at the upper end of the T3 number of event types variable, and a further two at the upper end of the distribution for the T4 number of event types variable. No extreme or

multivariate outliers were detected using Malahonbis and Cook's distance procedures, and so no further action was taken.

9.5.2. Preliminary analyses

Descriptive and correlational analysis for PTG across the four time points is presented in Table 16. PTG at T3 was not related to growth at T1, T2 or T4. T1, T2 and T4 PTG were all positively correlated with one another. PTG means were similar across the four time points, although T1 PTG was significantly higher than T2 PTG [t (72) = 4.35, $p < .001$, $d = .16$]. At T4, and consistent with prior studies in this thesis, the vast majority of participants (97.6%) scored 1 and above on the PTGI-SF measure, indicating at least some positive changes had been experienced following their adverse events.

PTS intrusions were more closely related to event characteristics compared to PTG and decreased over time, with T1 PTS intrusions significantly higher than at T3 [t (49) = 3.88, $p < .001$, $d = .48$] and T4 [t (41) = 5.76, $p < .001$, $d = .73$]. Forty-four people (16.4%) in the sample experienced a further event at any of the four time points. Additional t-tests suggested that those who experienced another event at any time point did not differ in PTG (all $p \geq .305$, d ranges between .04 and .33), although they reported significantly higher PTS intrusions at T1, T3 and T4 (all $p \leq .005$, d ranges between .66 and 1.20).

Table 16. *Descriptive and correlational statistics for longitudinal variables (T1 N = 268; T2 N = 73; T3 N = 50; T4 N = 42).*

Variable	M	SD	Range	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 interpersonal event	.68	.47	0 – 1	-														
2. T2 interpersonal event	.27	.45	0 – 1	.28*	-													
3. T3 interpersonal event	.08	.27	0 – 1	.18	.04	-												
4. T4 interpersonal event	.60	.50	0 – 1	.23	.00	.06	-											
5. T1 number of event types	4.03	2.47	1 – 14	.45***	.24*	.30*	.27	-										
6. T2 number of event types	.99	.93	0 – 5	.31**	.74***	.09	.13	.40***	-									
7. T3 number of event types	.40	.81	0 – 3	.15	.13	.50***	-.02	.17	.23	-								
8. T4 number of event types	.88	.85	0 – 5	.27	.20	.10	.46*	.44**	.25	.26	-							
9. T1 intrusive thoughts	6.11	3.26	0 – 12	.25***	.18	.21	.41	.30**	.20	.20	.50**	-						
10. T3 intrusive thoughts	4.58	3.70	0 – 12	.37**	.40**	.18	.36	.34*	.31*	.31*	.53***	.63***	-					
11. T4 intrusive thoughts	3.83	3.46	0 – 12	.47**	.21	.26	.45*	.62***	.29	.27	.61***	.66***	.76***	-				
12. T1 PTG	25.36	13.00	0 – 50	.02	.03	.10	.21	.06	.02	.13	.16	.20**	.26	.24	-			
13. T2 PTG	21.85	10.50	0 – 50	.14	.14	.26	.38	.22	.14	.16	.12	.14	.19	.30	.44***	-		
14. T3 PTG	23.86	10.97	0 – 42	-.20	.06	-.04	.24	-.19	.25	.09	.04	.00	.07	-.03	.21	.24	-	
15. T4 PTG	22.64	12.49	0 – 50	-.09	-.20	.16	.21	.29	-.05	.13	.30	.10	.30	.57***	.41**	.47**	.29	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Interpersonal event variables were dummy coded: 0 = no interpersonal event; 1 = interpersonal event.

9.5.3. Analysis of participant attrition and sample representativeness

A series of logistic regressions were conducted using the 'enter' method on SPSS (version 23.0) to explore potential reasons for drop out at any time point over the course of the study. To avoid overfitting the model by including too many predictors relative to sample size (Tabachnick & Fidell, 2013), separate logistic regressions were carried out with demographic predictors in one model and psychological variables in a separate model for each time point. Participant dropout was dummy coded (0 = no dropout; 1 = participant dropped out) and included as the criterion variable. Overall, six separate logistic regressions were conducted with the following predictors of dropout: (1) T1 demographics (age, gender, ethnicity, sexuality, marital status, religion and disability); (2) T1 measures (interpersonal event, number of event types, age at serious event, time since event, spirituality, active coping, avoidant coping, emotional coping, PTS symptoms, social support, PTG); (3) T2 demographics; (4) T2 measures (interpersonal event, number of events experienced in six months, number of event types, PTG); (5) T3 demographics; (6) T3 measures (interpersonal event, number of events experienced in six months, number of event types, PTS symptoms, centrality, intrusive and deliberate rumination, present and future control, PTG).

When T1 demographic factors were entered as predictors of T2 dropout, the resulting model was a good fit [*H-L* $\chi^2(8) = 9.30$, $p = .318$], however no single variable predicted dropout (all variables $p \geq .120$, $R_L^2 = .06$, OR values close to 1 and 95% CI including zero). Similarly, the second model with T1 psychological measures also fit the data well [*H-L* $\chi^2(8) = 8.36$, $p = .400$], although the predictors poorly explained dropout (all variables $p \geq .170$, $R_L^2 = .04$, OR values close to 1 and 95% CI including zero).

In respect of predictors of T3 attrition, a good model emerged [*H-L* $\chi^2(8) = 9.06$, $p = .337$] and revealed that females were six times more likely to dropout [OR = 6.73; 95% CI: 1.26, 36.06), $p = .026$], which may be expected given that around three-quarters of the sample were female. An acceptable model was also obtained when identifying T2

psychological predictors of T3 dropout [*H-L* $\chi^2(8) = 13.04$, $p = .111$]. Results indicated that participants who dropped out did not differ in respect of adversarial exposure, frequency or PTG over the six-month period between T2 and T3 (all variables $p \geq .073$, $R_L^2 = .08$, OR values close to 1 and 95% CI including zero).

Finally, an exploration of T3 predictors of T4 dropout revealed a good model [*H-L* $\chi^2(8) = 8.73$, $p = .365$] that established no differences on any demographic variables between those who remained or left the study (all variables $p \geq .324$, $R_L^2 = .06$, OR values close to 1 and 95% CI including zero). Additionally, a well-fitting model [*H-L* $\chi^2(8) = 7.80$, $p = .453$] indicated that participant retention at T4 could not be explained by any T1 variables (all variables $p \geq .314$, $R_L^2 = .07$, OR values close to 1 and 95% CI including zero). As previously noted, the dropout of females at T3 appeared to have some impact on the gender-balance in the final sample. While the percentages in Table 15 indicated that the proportion of females had gradually decreased from T1 (79.9% at T1 to 71.4% at T4), the ratio of male to females actually increased over time, ranging from 27:107 at T1 (25.2% when expressed as a percentage), 18:55 at T2 (32.7%), 7:18 at T3 (38.9%), and 2:5 at T4 (40.0%).[48]

9.5.4. Growth curve modelling

GCM was conducted to assess changes in PTG over time for the sample, using SPSS (version 23.0) with maximum likelihood estimation. To guide the GCM analysis, a common approach is to plot mean trajectories for a small number of randomly selected participants in the sample (DeLucia & Pitts, 2006). Figure 10 displays the raw score trajectories for 10 individual participants selected at random from the sample.[49]

[48] The ratios are expressed in their simplest form, or lowest possible term.
[49] To limit any potential bias from the researcher, cases were identified using Excel command ["=RAND ( )"] which selects cases at random from the data.

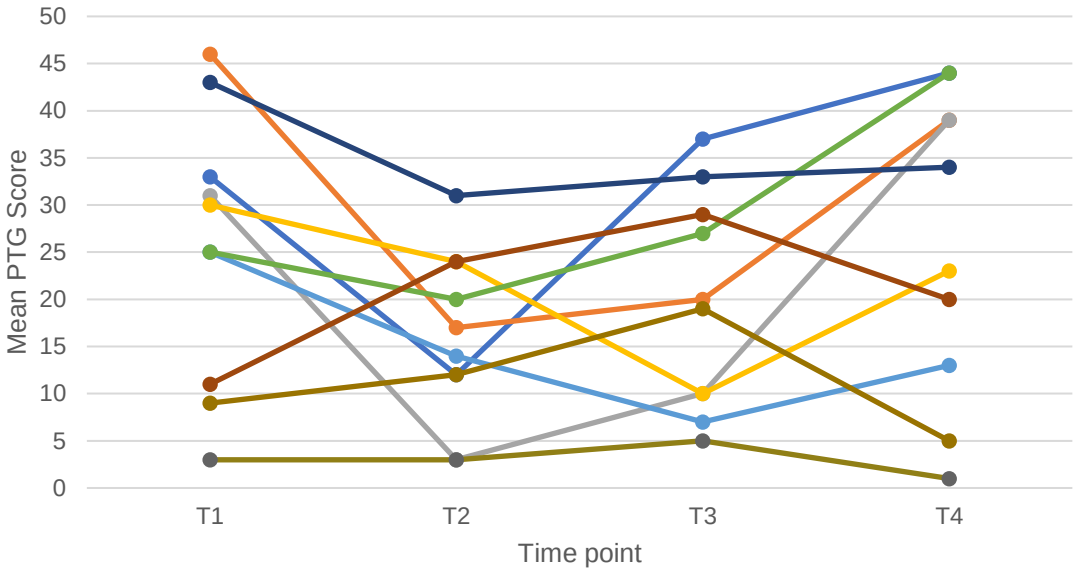

Figure 10. Raw data for 10 participants selected at random from the sample. Each line represents a participant.

Figure 10 indicates that initial PTG scores varied among participants. There is variability in how growth changes over time; some individual's PTG appears to increase over time, while this decreases for some participants, and the trajectory of others remains relatively stable. Some of the trajectories appear to display a quadratic (U-shaped) trend, which may fit the data better than a linear trend. GCM allows the variability in initial scores and rates of change to be modelled. Based on these observations, the decision was made to include a model with random intercepts that better reflected the data, allowing participants to have varying initial PTG scores (Peugh, 2010). Furthermore, an unstructured covariance was used for all subsequent analysis, as it does not assume that covariance conforms to a systematic pattern (Field, 2013).

A series of models (A to D) of increasing complexity were tested according to procedures demonstrated in other studies (DeLucia & Pitts, 2006; Peugh & Enders, 2005), with summary statistics at each stage presented in Table 17. It is suggested that

under certain circumstances,[50] researchers should consider whether to centre continuous predictor variables to aid the interpretation of the intercept, by subtracting the mean from the variable (Peugh, 2010). Therefore, time was centred at the first-time point (e.g. T1 = 0, T2 = 1, T3 = 2, T4 = 3) in order to interpret the intercept as the initial mean PTG value in each model (Shek & Ma, 2011). However, the continuous level one predictors (number of event types, PTS intrusions) were not centred, as their zero values were meaningful and in range of the data set (e.g. a score of zero on the number of event types variable can be interpreted as not having experienced any types of adverse event; Peugh, 2010).

Unconditional means model (Model A)

Model A (unconditional means model) is a baseline model with random effects and no predictors. It assesses the mean PTG variable and the amount of variation in PTG scores that is attributed to interindividual differences, with no other predictors included. Random intercepts were selected as Figure 10 indicated heterogeneity in initial PTG scores at T1, and thus the model would allow individual trajectories to vary. This model indicated significant variability both between ($p < .001$) and within individuals ($p < .001$), with 40% of the variance in PTG scores due to interindividual differences. As the variance was above 25%, this indicated that GCM procedures would perform better than traditional ANOVA (Shek & Ma, 2011)[51], and thus further analysis was warranted.

Unconditional linear growth model (Model B)

In model B (unconditional linear growth model), individual variation in PTG growth rates was examined with time entered as a covariate. This model assumes the rate of growth remains constant for individuals in a linear fashion. The model reduced the PRV by 5% and explained 44% of the overall variability in PTG, although Model B was not a

[50] This can include reducing multicollinearity, examining interactions between level one and level two variables, to make zero values meaningful, or if level two variables are of primary interest (Field, 2013), which were not applicable here.

[51] If the ICC falls below 25%, GCM analyses are not needed as they would show similar results when estimating fixed effects in ANOVA (Shek & Ma, 2011).

significant improvement upon Model A [χ^2 (3) = 4.81, p = .186]. Furthermore, the linear trend was not significant (p = .079) and indicated that slopes did not vary between individuals (p = .712). However, the significant intercept (p < .001) indicated that initial PTG values were not the same for all participants, also evidenced by Figure 10, and thus the decision to include random intercepts was justified (Peugh & Enders, 2005).

Unconditional quadratic growth model (Model C)

Model C assessed whether rates of change in PTG may be better explained using a higher-order polynomial. Four measurements were taken, which permits the examination of an unconditional quadratic growth curve model (Tabachnick & Fidell, 2013). This model assesses whether the data were better represented using a U-shaped trajectory, which allows for acceleration or deceleration of PTG over time. Results revealed that Model C reduced the unexplained variance from Model B by 4%, and therefore explained 47% of the within and between-person variability in PTG over time. There were significant variations in the initial status, linear and quadratic trajectories among participants (all $p \leq .047$). The linear effect was negative (p = .015) but then positive in terms of quadratic growth (p = .047), suggesting that PTG declined initially for the sample, although decelerated. The slopes for all participants remained similar (p = .680). As the quadratic model demonstrated improved model fit over the linear Model B [χ^2 (1) = 3.88, p = .048], the former was retained in subsequent analysis.

Unconditional quadratic growth model with predictors (Model D)

As model A indicated heterogeneity in PTG scores, covariates were added in model D in order to explain such variability (Peugh & Enders, 2005). Event characteristics (experienced event, interpersonal event, number of event types) and intrusive thoughts were simultaneously entered as predictors to test their effect on the intercept and slope of the PTG growth trajectory. The predictors were treated as fixed

effects, as previous models had indicated that the rates of change for participants were similar, indicated by non-significant slopes.[52]

When controlling for these variables, model D indicated that the rate of change in PTG initially increased but subsequently decreased, indicated by positive linear and negative quadratic trends, although only the latter was significant (p = .018). Intrusive thoughts exhibited significant effects on the initial status (p = .001), linear (p = .004) and quadratic slope changes in PTG (p = .001), with negative and positive effects on the linear and quadratic slopes, respectively. Non-significant event characteristics were retained to control for their effects, suggesting that those who experienced further events, more frequent and interpersonal events had similar PTG to those who did not. The resulting model was a significant improvement on Model C [χ^2 (12) = 593.69, p < .001], reducing the variance by a further 8% and therefore accounting for a 26% reduction in variation in PTG scores over time compared to Model A. Model D also explained over half (56%) of the within and between-person variability in PTG scores over time. Based on improved fit statistics, Model D was deemed the final model. The predicted average PTG trajectories that account for the effect of the predictor variables is presented in

Figure *11*.[53] Generally, PTG increased between T1 and T2, before declining afterwards and dropping more sharply between T3 and T4.

[52] While it would be intuitive to model all predictors as random effects (i.e. therefore assuming the value of each predictor varies according to every individual rather than remaining constant), it can introduce computational difficulties, overfitting and complexity into the model, which should be parsimonious (McCoach & Kaniskan, 2010). When the individual predictors were included in Model D as random effects, the models failed to converge and so remained as fixed effects.
[53] Graphs of growth curves for the non-significant variables can be found in Appendix XIV.

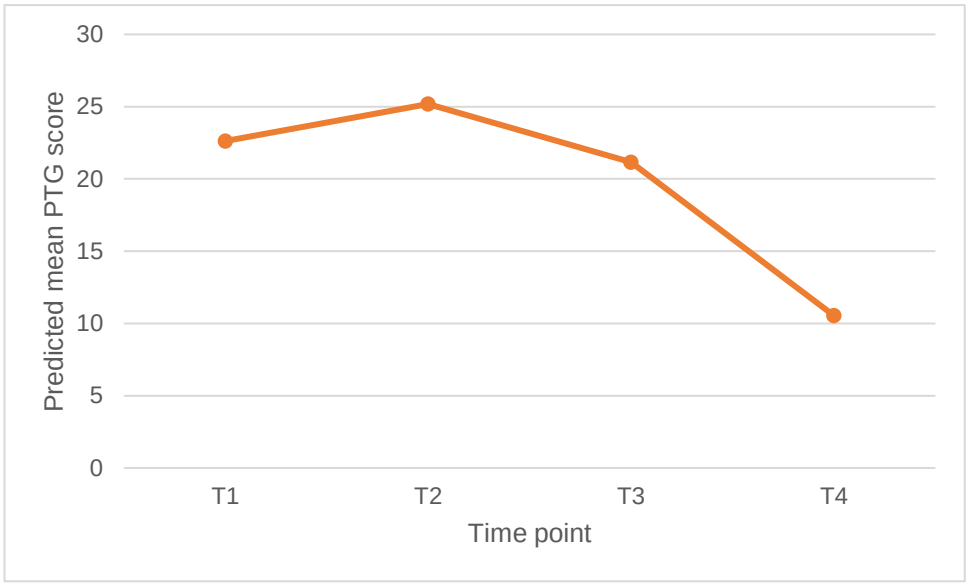

Figure 11. Influence of intrusive thoughts on predicted PTG growth trajectory over time, controlling for event characteristics.[54]

9.5.5. Results summary

In summary, logistic regressions indicated that the T2, T3, and T4 data remained generally representative of the original sample at T1. Mean values indicated that PTG remained generally stable, however, taking event characteristics and intrusive thoughts into account, GCM suggested greater variability around mean PTG at the initial status. A quadratic trend fit the data best, displaying an inverted 'U' shape. Intrusive thoughts alone significantly predicted change in PTG over time, while event characteristics were unrelated to the growth trajectory. The models tested subsequently accounted for a greater proportion in the reduction of residual variance over time, and over half of the variability in PTG scores.

[54] These are predicted mean values suggested by the model. The graph was plotted with the aid of an Excel algorithm provided by researchers in this area (C. Ma, personal communication, 24 April 2017).

Table 17. *Parameter estimates (and standard errors) of individual growth curves for each model tested*.

Variable	Model A[a]	Model B	Model C	Model D[c d]
		Fixed effects		
Intercept				
Initial status	24.51 (.70)***	24.93 (.76)***	25.23 (.78)***	21.81 (2.85)***
Experienced further event[b]				-3.17 (2.04)
Interpersonal event[b]				1.81 (1.86)
Number of event types				.14 (.34)
Intrusive thoughts				.82 (.25)**
Linear slope				
Initial status		-.95 (.53)	-4.09 (1.65)*	7.99 (5.10)
Experienced further event[b]				.85 (6.14)
Interpersonal event[b]				.22 (6.31)
Number of event types				1.32 (2.91)
Intrusive thoughts				-2.15 (.72)**
Quadratic slope				
Initial status			1.17 (.56)*	-4.27 (1.77)*
Experienced further event[b]				.09 (2.30)
Interpersonal event[b]				1.09 (2.30)
Number of event types				-.54 (1.03)
Intrusive thoughts				.98 (.27)**

		Random effects		
Residual (within)	94.83 (10.80)***	90.02 (12.37)***	86.58 (11.85)***	69.60 (10.84)***
Level 2				
Intercept (between)	62.54 (14.51)***	71.91 (18.02)***	75.65 (17.73)***	88.92 (16.13)***
Slope		2.15 (5.84)	2.30 (5.58)	1.81 (5.68)
		Fit statistics		
Deviance (-2LL)	3380.96	3377.18	3373.30	2779.61
AIC	3386.96	3389.18	3387.30	2818.61
BIC	3399.19	3413.60	3415.79	2891.39
df	3	6	7	19
		Variance explained		
ICC	40	44	47	56
PRV	-	5	4	8

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; ICC = Intraclass correlation coefficient; PRV = Proportion reduction in variance. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

[a] Model A = unconditional means model; Model B = unconditional linear growth model; Model C = unconditional linear and quadratic growth model; Model D = unconditional linear and quadratic growth model with added experienced further event(s), interpersonal event, number of event types and PTS intrusions as predictors.

[b] Reference categories are those who experienced further events, and those who experienced an interpersonal event.

[c] Age, gender and ethnicity were included in a subsequent model as controls, but were a poorer fit and therefore removed.

[d] As other characteristics of PTS (American Psychiatric Association, 2013), avoidance and hyperarousal were also included as predictors, however these were non-significant.

9.6. Discussion

This longitudinal study was the first to explore how people's perceptions of PTG changed as a function of exposure to multiple types of events and intrusive thoughts over an 18-month period. Using sophisticated GCM techniques, the key finding was that people's long-term perceptions of PTG were influenced by the presence and intensity of intrusive thoughts, rather than the type or frequency of events experienced. This is broadly supportive of the FDM and ACPM (Joseph et al., 2012; Tedeschi & Calhoun, 2004) and the findings of previous chapters in this thesis that suggest growth emerges as a result of an emotional struggle to come to terms with events, rather than sole exposure to adversity itself.

9.6.1. Curvilinear relationships between intrusions and posttraumatic growth

An inverted-U curvilinear trajectory was observed between intrusive thoughts and PTG, such that growth was lower at the beginning and end of the study period. Curvilinear relationships may illustrate the cognitive processing of events over time. The aftermath of adverse events can lead to distress, marked by increased intrusive thoughts and a period of cognitive processing where experiences can be meaningfully interpreted (Cann et al., 2011; Stockton et al., 2011). Average growth then decreased in the trajectory, which may reflect that the initial crisis has passed with information about the event being accommodated into an individual's schemas and assumptive world, in line with the ACPM (Joseph et al., 2012; Tedeschi & Calhoun, 2004). The findings are consistent with studies that report inverted-U relationships between PTG and PTS symptoms (Kleim & Ehlers, 2009; Lechner et al., 2006; Levine et al., 2009; Taku et al., 2015), although this study went further to specifically identify intrusive symptoms as the key aspect of PTS that drives the process of PTG in people over time.

The findings call into question assumptions that PTG remains relatively constant over time (Linley & Joseph, 2004; Marshall et al., 2015). Rather, the current study suggests that the trajectory can change over time, displaying a quadratic rather than

linear effect. As PTG seems to be an idiosyncratic experience, it is surprising that existing studies do not accommodate the possibility of such variation in growth trajectories (e.g. Danhauer et al., 2015). For example, inspection of mean PTG levels at the four time points found these to be similar, thus implying a near-linear trend. However, relying on analysis of means alone disregards the influence of other factors on PTG trajectory. As this study has shown, PTG over time was curvilinear when accounting for intrusive thoughts, which may arise as the survivor disengages from previously held world views and interprets the meaning and significance of their experiences (Tedeschi & Calhoun, 2004).

9.6.2. Event characteristics and long-term posttraumatic growth

Earlier longitudinal literature has not explicitly accounted for event characteristics when evaluating their subjective impact on the individual (e.g. Dekel et al., 2012; Frazier et al., 2004). As hypothesised, the PTG trajectory identified within the sample did not appear to be influenced by the frequency or type of events experienced, nor the experience of subsequent events during the study period. The findings support those observed in in other cross-sectional literature (e.g. Morris & Shakespeare-Finch, 2011; Stockton, Hunt, & Joseph, 2011) that confirms the importance of intrusive thoughts in determining adjustment outcomes (Morris & Shakespeare-Finch, 2011; Stockton et al., 2011). Furthermore, the findings are also consistent with the results of cross-sectional studies 1 and 3, such that event characteristics exerted weak effects on the level of growth reported. Thus, the assumption that subjective interpretations of the event are more important for growth compared to the objective characteristics of the event (Joseph et al., 2012; Tedeschi & Calhoun, 2004) appears to be supported in a longitudinal as well as cross-sectional context.

Interestingly, while distress was higher among people who experienced subsequent adverse events, PTG remained similar regardless of exposure. The findings are contrary to arguments that PTG may be inhibited after multiple adverse events

(Tedeschi & Calhoun, 2004; Valdez & Lilly, 2015), yet offer support to other studies that find no such effect (Marshall et al., 2015). This may point to a cumulative impact of multiple adversity and a diminishing dose-response, such that subsequent events are not necessarily perceived as seismic enough to alter growth in any significant way. In this manner, the nature or frequency of events may become less important compared to the way in which survivors are engaged in cognitive processing to maintain coherence and reduce distress, despite challenging circumstances (Veronese et al., 2017). This explanation would appear consistent with the FDM and cognitive dissonance interpretations which imply that survivors use PTG as a means to compensate against distress (Blix et al., 2013). Thus, growth in the context of multiple event types may represent an illusory strategy.

Alongside the finding that multiple event types (and subsequent experiences of adversity) did not significantly contribute to the average PTG trajectory, the type of event equally did not explain long-term changes in PTG. Unlike previous research (Kleim & Ehlers, 2009; Valdez & Lilly, 2015), this study was advantageous in that it had a large sample to explore whether the type of event influenced PTG over time. However, Study 4a suggests that the subjective impact of the adverse experience is likely more important in explaining growth trajectories (Joseph et al., 2012; Tedeschi & Calhoun, 2004), regardless of whether the event is classed as interpersonal or non-interpersonal.

9.6.3. Changing quality of long-term posttraumatic growth

The findings contribute to the debate on the function of PTG over time (see section 9.2.4.). It is argued that a reduction in PTG over time may signify its illusory quality (Zoellner & Maercker, 2006; see Chapter 2, section 2.6.2.1.), whereas constructive growth should lead to increased PTG over time and a reduction in negative symptoms. The finding that the average PTG trajectory decreased slightly over time could suggest that growth may be an attempt to mitigate against distress from intrusive thoughts, which too declined over the 18-month period. In the aftermath of adversity,

people may experience a euphoric reaction that is not necessarily grounded in reality (Calhoun & Tedeschi, 2004), and thus PTG in the short-term may represent a self-enhancing cognitive bias (Zoellner & Maercker, 2006). This may be represented by the increase in PTG from T1 to T2. A 'psychological preparedness' can emerge in which people become more attuned to the potential for negative life events to occur based on their past experiences (Janoff-Bulman, 2004). In turn, this reduces demands on cognitive processing and the risk of developing adverse psychological consequences in the future should further events materialise. This may be illustrated by the fact that PTG remained relatively stable between T2 and T3, while mean intrusion values decreased (see Table 16). PTG can, therefore, potentially buffer against stress in populations that not only experience isolated events (Kleim & Ehlers, 2009), but in those likely to experience more frequent adversity. For example, this can include survivors of intimate partner violence (Kunst et al., 2010), those living in areas prone to earthquakes (Marshall et al., 2015), or residing in conflict zones (Veronese et al., 2017). The findings therefore contribute towards knowledge of the function that PTG serves in the context of multiple adverse events.

9.6.4. Strengths and limitations

Although GCM analysis can handle missing values and variables collected at a different number of time points, data sets with as few missing values as possible are preferable (Curran et al., 2010). Yet, the statistical analysis is advantageous in that it does not require the deletion of incomplete participant data, thus estimates are not biased by removing those who dropped out. Additionally, while the variables accounted for a 26% reduction in the variance of PTG scores over time, there remained unexplained variance in the final model. As suggested by Study 2, the experience of PTG is highly individualised. Additional covariates could include the measurement of coping, cognitive and emotional responses pre-event and at regular time points which may also inform changes in growth trajectories over time and explain variability in PTG scores (Jayawickreme & Blackie, 2014).

While the T4 sample remained largely representative of the sample at T1 in terms of demographic and psychosocial characteristics (see section 9.5.3.) with the exception of female dropout, there were qualitative differences in terms of the distribution of adverse events across time points. For instance, nearly half of the T1 sample (48.9%) reported accidents at T1, yet this fell to 2.4% at T4, while child sexual abuse was not reported at all in T2, T3 and T4. While these differences are expected given that some events such as child sexual abuse are inherently age-dependent (Ogle et al., 2013), the changing distribution over time may have confounded attempts to examine the role of event characteristics on longer-term PTG trajectories, particularly as the type of event experienced can impact on PTS symptoms differentially (see Chapter 2, section 2.7.3.3.) However, this limitation should be considered in the context of existing research (Linley & Joseph, 2004) and previous studies in this thesis that increasingly indicate that growth can be reported regardless of the nature or frequency of adverse events.

Finally, the study measured PTG at four time points over an 18-month period which, although longer than other longitudinal studies in this area (e.g. Kleim & Ehlers, 2009; Salsman et al., 2009; Valdez & Lilly, 2015), limited analysis to quadratic trends. It is therefore not possible to determine how PTG is sustained beyond this point. However, additional time points may allow growth to be explained by cubic (S-shaped) trends that fluctuate over time. In addition, the data only provide an indication of PTG change over an 18-month period *following* an encounter with an adverse event, or events. The findings acknowledge great variation in PTG at T1, but because T1 data was collected retrospectively after the sample had already experienced adversity, the initial measurement PTG is not necessarily the 'starting point' for people's growth in the sample. Indeed, adverse events prior to this study may have already triggered PTG processes that were captured here.

9.6.5. Implications

Addressing a key aim of the thesis as a whole (see Chapter 3, section 3.2.), the key implication of this study is the contribution of knowledge on the relationship between growth and distress. It would appear that PTG and PTS are intertwined as individuals attempt to reconcile with their experiences, and may not be sustained over time. The relationship does not appear to be linear as previously suggested (Danhauer et al., 2013; Lowe et al., 2013), and is resistant to adverse event characteristics. This may provide clarity to cross-sectional studies that have reported mixed findings in the literature (see Chapter 2, section 2.7.2.). Furthermore, while event characteristics did not directly contribute towards variability in PTG over time, the fact that growth remained relatively stable despite further adverse events may reflect a coping strategy in the face of overwhelming threat.

The clinical implications of this study would suggest that practitioners should focus on intrusive thoughts as an indicator of the extent to which individuals are experiencing PTG, as opposed to the nature of the events experienced. Specifically, the distress associated with intrusive thoughts should not be mistaken as a failure to process the event; rather, practitioners should monitor and support survivors as they work through their experience. However, practitioners may also be mindful of increased PTG in the aftermath of adverse events which may signify coping attempts if accompanied by continued distress, at least in the short-term. Given that growth gradually tended to decrease over time, it may be that in the long-term, growth cannot be sustained for some people.

9.6.6. Conclusion

The results of Study 4a support the idea that changes in PTG over time are more strongly determined by the subjective impact on the individual via intrusive thoughts, as opposed to the objective characteristics of the event. Furthermore, the relationship between growth and intrusions is likely curvilinear, and may change over time, perhaps

due to the illusory and constructive sides of PTG. However, this study also identified a sizeable proportion of variance that was not explained by the event-related and intrusive factors alone. Therefore, Study 4b will draw upon a wider range of cognitive and psychosocial variables and qualitative data that may explain variability in PTG trajectories over time.

Study 4b: Trajectories of posttraumatic growth – A mixed-method analysis

9.7. Introduction

The findings of Study 4a showed that people's average PTG trajectory over an 18-month period was strongly predicted by intrusive thoughts, rather than the characteristics of adverse event or subsequent events. However, the study also found variability and individual differences that were not explained by event characteristics or intrusive thoughts alone. Further analysis is therefore warranted to explore the characteristics of individuals that might explain such variability (Tabachnick & Fidell, 2013). Moreover, while recent longitudinal studies have considered average PTG trajectories in different samples (Danhauer et al., 2013, 2015; Dekel et al., 2012), they only provide general findings in the sense that they do not draw distinctions between different levels of PTG that may be reported by survivors over time (see section 9.5.4., Figure 10). Study 4b will therefore extend the findings of Study 4a to explore whether people can report different trajectories of growth over time.

9.7.1. Trajectories of posttraumatic growth

As noted in section 9.2., studies have started to examine the progression of PTG over time. Existing longitudinal research suggests that different trajectories of PTG can be reported. In their study of women with breast cancer over 18 months, Danhauer and colleagues (2015) identified six different PTG trajectories, three of which were moderate to high and stable, two were consistently low to moderate, and one which started off with a low level of PTG that gradually increased over time. Meanwhile, longitudinal studies of earthquake survivors (Marshall et al., 2015) and military veterans (Tsai & Pietrzak, 2017) reported three different trajectories which either increased, decreased or remained consistent over a two and four-year period, respectively. Thus, while time is a prerequisite, alone it is not sufficient to facilitate growth.

Within PTG frameworks, it is noted that growth is a developmental construct that can be influenced by a range of psychosocial and cognitive variables which could enhance or reduce growth (Joseph et al., 2012; Tedeschi & Calhoun, 2004) and the effects of these are likely to play out over time. Indeed, some studies have started to explore factors that can differentiate between different trajectories of PTG, although they are few in number. The trajectories in the Danhauer and colleagues (2015) study described previously were found to differ according to the perceived severity of the illness, active coping strategies, and social support, with lower levels of stressor intrusiveness, coping and social support in the lower PTG trajectory. In the study of military veterans (Tsai & Pietrzak, 2017), greater gratitude, purpose in life, spirituality and PTS symptoms predicted membership of the high PTG trajectory. These findings appear consistent with emerging literature that argues that a greater endorsement of simultaneous positive and negative symptoms is associated with higher growth trajectories over time (Michélsen et al., 2017; Pat-Horenczyk et al., 2016), while those who report fewer negative effects experience the least PTG (Morgan & Desmarais, 2017). While Study 4a considered only intrusive thoughts due to their role in processing the event, it is likely that PTG trajectories are influenced by a wide range of cognitive and psychosocial factors.

To add further complexity to the above findings, distinctions can be drawn among survivors who maintain a stable PTG trajectory, compared to those whose growth is more variable over time. One study of military veterans revealed that 48.1% of the sample maintained a similar level of PTG over a two-year period (Tsai, Sippel, Mota, Southwick, & Pietrzak, 2016). They found that those who maintained PTG levels were more altruistic, spiritual and had experienced multiple types of adverse events during the study period, compared to survivors whose PTG declined. It may be that the multiple events in this instance could act to sustain the process of reconfiguring world views. Together, these studies imply that the temporal course of PTG is heterogeneous, in which some people's growth is more constant than others whose growth may fade. It is likely that

individual differences, and the psychological resources the person draws upon, may be critical to determining PTG trajectories.

9.7.2. Factors associated with long-term constructive and illusory posttraumatic growth

As well as differentiating between the levels of growth people can report over time, recent research (Pat-Horenczyk et al., 2015) has called for trajectories to be distinguished by the quality of PTG experienced. Specifically, there is a need to identify factors associated with the illusory, self-deceptive side of PTG, primarily consisting of avoidant strategies (Maercker & Zoellner, 2004; Taylor, 1983), and those aligned with the constructive aspect, measured by *actual* behaviour change and cognitive engagement with adverse event-related thoughts (Zoellner & Maercker, 2006). The distinction between the quality of growth is important as it would provide a context to earlier findings (e.g. Tsai et al., 2016) that some PTG trajectories are changeable and others remain constant. Indeed, the focus on average trajectories in Study 4a helped to quantify the impact of intrusive thoughts on growth over 18 months, but it is limited in its scope to provide a more comprehensive examination of long-term changes in PTG. A more nuanced approach which distinguishes between the quality of PTG in addition to the levels of growth reported can add more insight into the processes and outcomes associated with PTG. Study 4b will therefore address this gap in the literature by exploring the validity of PTG in any identified trajectories.

9.7.3. Application of mixed-method approaches to posttraumatic growth trajectories

It is common for longitudinal PTG studies to examine numerical data to explore trajectories. With the exception of recent PTG research on stroke survivors (Kuenemund et al., 2016), sex offenders (Vanhooren et al., 2017) and midwives (Beck et al., 2017), few studies simultaneously collect qualitative data in addition to quantitative data in a mixed-methods design. Combining both quantitative and qualitative data in the current

study would enrich the findings by incorporating multiple perspectives, thereby contextualising the PTG data further (Creswell, 2014; see Chapter 4, section 4.4. for discussion of mixed-methods). However, the mixed-method studies already discussed were cross-sectional, meaning that they were unable to assess whether qualitative data provided at an earlier time point could provide some indication of growth trajectories in the longer-term. This could have potential clinical utility so that support can be put in place to encourage or raise awareness of PTG themes that may (or may not) be apparent within individual disclosures, if they continue on the same adjustment trajectory.

Mixed method approaches could offer insight into the quality and validity of PTG. Existing longitudinal studies (e.g. Danhauer et al., 2015; Dekel et al., 2012) provide general findings in that they only consider average trajectories of PTG, rather than quality of PTG which may speak more about the characteristics of growth experienced. In addition, while Study 4a provided some insight into relationships between PTG, intrusive thoughts and the quality of PTG, it lacked qualitative supporting evidence. Despite being proposed over a decade ago, the JFM (see Chapter 2, section 2.6.2.1.) has received limited empirical attention. So when quantitative and qualitative data corroborate one another, this may provide evidence for the constructive aspect of PTG that is positively associated with transformational changes in an individual's life being present (Zoellner & Maercker, 2006). In this instance, reports of growth are reflected in significant psychological improvements to everyday functioning, which are over and above that which existed prior to the adverse event, including closer relationships with people and a new life philosophy. However, should the quantitative and qualitative evidence diverge, this could suggest that PTG may be a positive illusion or an adaptive attempt to manage distress (Zoellner & Maercker, 2006). For example, people may say they have grown, but provide little evidence of behavioural change or cognitive attempts to engage with the stressor (Hobfoll et al., 2007).

9.8. Aims of study

Consistent with the overall aims of the thesis (see Chapter 3, section 3.2.), the purpose of Study 4b is twofold: (1) to examine whether there are subsets of individuals who experience different levels of PTG over time; and (2) to examine the extent to which quantitative and qualitative data provided at different time points can indicate the quality of PTG people will experience after an 18-month period. This will be achieved by combining both quantitative data from all previous studies (T1 to T4) and qualitative data provided by participants from Study 2 (T2). As this is a preliminary and exploratory investigation, no specific hypotheses were made.

9.9. Methods

9.9.1. Research design

The study adopted a concurrent triangulation design, depicted in Figure 12, which treats both quantitative and qualitative data equally to address the research questions of interest (Creswell, 2014). According to this approach, both types of data are collected separately and analysed independently, but are not interpreted together until both data sets are complete. The purpose of this concurrent design is to eventually merge the data to compare similarities and differences (Creswell, 2014). Additionally, areas of 'silence' can also be analysed, where qualitative or quantitative data are provided to address a theme, but no corresponding data is available from the other (qualitative or quantitative) method (Farmer, Robinson, Elliott, & Eyles, 2006).

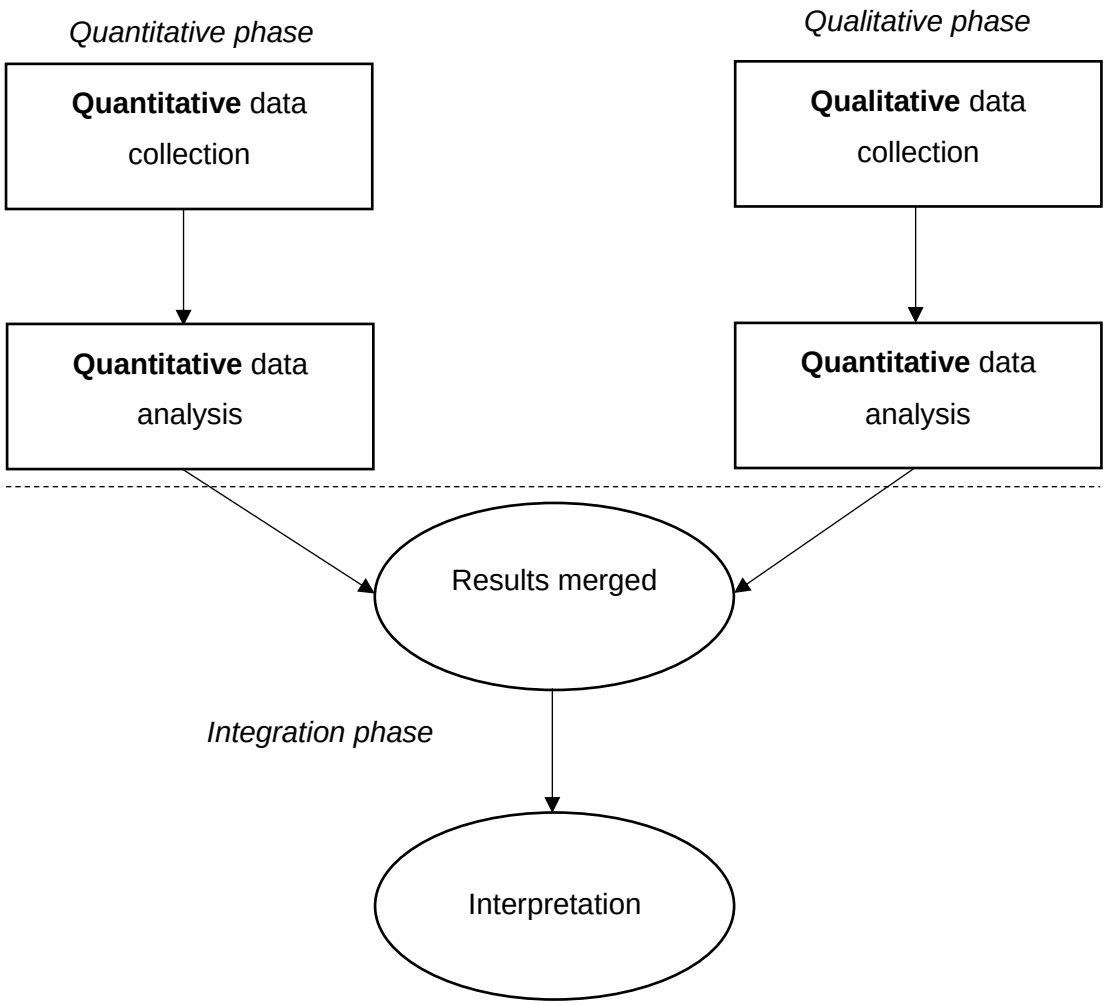

Figure 12. Concurrent triangulation design (adapted from Creswell, 2014), with the phases of the current study indicated.

9.9.2. Data collection

9.9.2.1. Quantitative phase

Participants were the cohort of 42 people (30 females and 12 males; see Table 15 in section 9.4.1. for demographic information) who participated at all four time points and thus provided complete data. As this study is an additional analysis of some of the data in studies 1, 2, 3 and 4a, the procedures for collecting data for Study 4b are already described elsewhere (see Study 1, section 5.5, Study 2, section 6.3.3., Study 3, section 8.4, and section 9.4.). The longitudinal nature of this investigation meant that the PTG trajectories could be evaluated with reference to multiple variables captured over the course of the study. Event characteristics at all four time points (interpersonal adversity,

number of event types, number of events) were captured using the PDS which was slightly adapted at T2, T3 and T4 to account for additional events experienced during the study period (see Appendix XIII). In respect of psychosocial factors, intrusive thoughts (T1, T3 and T4), T1 coping (active, avoidant, emotional, spirituality), T1 social support, T3 intrusive and deliberate rumination, T3 event centrality, and T3 present and future perceived control were captured using measures already described in preceding studies of this thesis (see section 9.4.1.). Test-retest reliability was not calculated for the PTSD-8 and PTG measures as six month intervals are considered too long to accurately measure temporal stability (Anastasi & Urbina, 1997).

9.9.2.2. Qualitative phase

Of the 42 people in the cohort at all four time points, 18 completed interviews at T2 (Study 2; 42.9%).[55] Relevant procedures and the interview schedule and are described in Study 2 (section 6.3.). The interview schedule focused on participants' experiences of positive and negative change, as well as factors that had facilitated or inhibited their growth. A wide range of people and adversity types were represented, with adverse event history and demographic information presented in Table 18.

[55] There were no differences on any key variables between those who provided T2 interviews and those who did not, except that those who completed interviews had significantly higher T1 PTS symptoms [$t(40) = 2.99$, $p = .005$, $d = .94$], and reported more adverse events at T4 [$\chi^2 (1) = 7.64$, $p = .006$, $V = .43$].

Table 18. *Demographic information and adverse event history for 18 interview participants.*

PPT number[56]	Age	Gender	Adverse event history[57]	Cluster
1	27	F	Bereavement, neglect	1
2	26	F	Accident, bereavement, serious illness	3
3	26	F	Vehicle accident, serious illness, bereavement, witnessed event	2
4	29	F	Vehicle accident, natural disaster, bereavement	2
5	25	F	Accident, sexual abuse	4
6	45	F	Stalking, IPV, rape, imprisonment, bereavement, neglect	3
7	38	M	CSA, IPV, physical assault, rape	3
8	56	F	CSA, torture, accident, physical assault, natural disaster, rape, imprisonment, neglect, bereavement, witnessed event, occupational event, other event	3
9	28	F	Psychotic episodes, neglect, emotional abuse	4
10	42	F	Vehicle accident, CSA, IPV, physical assault, serious illness, bereavement, neglect, witnessed event	3
11	40	F	CSA, rape, parental neglect, physical assault, bereavement	1
12	24	M	Vehicle accident, physical assault, CSA, serious illness, occupational event	1
13	27	M	CSA, vehicle accident, bereavement, neglect, occupational event	3
14	27	F	Natural disaster, attempted rape, physical assault, bereavement	1
15	36	F	CSA, rape, imprisonment	2
16	53	M	IPV, homelessness, imprisonment, witnessed event	4
17	33	M	CSA, military conflict, natural disaster, rape, neglect, witnessed event, other event	2
18	63	F	Child physical abuse, sexual assault, death of client, IPV, physical assault, serious illness	3

Note. PPT = participant. F = female; M = male. CSA = child sexual abuse; IPV = intimate partner violence. 1 = low PTG; 2 = increasing PTG; 3 = decreasing PTG; 4 = high PTG.

9.9.3. Data analysis

9.9.3.1. Quantitative approach

While the small sample does not permit detailed inferential testing, an exploratory two-step cluster analysis was conducted to identify underlying groupings of participants

[56] Participants were assigned a new number, which did not necessarily correspond with Study 2.
[57] Adverse event history corresponds to responses gathered using the checklist from the PDS (Foa et al., 1997) over four time points and any additional events referenced in the T2 interviews.

in the data, using PTG scores at the four time points. The technique achieves this by minimising differences within the same cluster and maximising differences with other clusters (Hair et al., 2010). Cluster analysis is appropriate for use with small sample sizes, particularly as other similar analyses – such as latent class analysis – require large samples (Hair et al., 2010). The fit of the items to their specific clusters can be assessed using the *average silhouette* measure. The average silhouette determines the appropriateness of the cluster solution, with values closer to 1 desired as this indicates the data are partitioned well (Rousseeuw, 1987). The appropriate number of clusters computed from a set of data is assessed using the AIC, with lower values indicating more parsimonious solutions (Kline, 2016). A ratio of the smallest to the largest group size is also provided, with values under 3 indicating a good fit (Hair et al., 2010).

To assess for any differences between clusters, chi-square analysis was conducted on nominal variables and followed up with post-hoc analysis of corrected residuals should any significant differences emerge (Beasley & Schumacker, 1995). Corrected residuals exceeding an absolute value of 1.96 are considered to be significant. To account for multiple comparisons, alpha corrections were made using the Holm-Bonferroni technique, which is more powerful and less conservative than the Bonferroni method (Holm, 1979). For continuous data, one-way ANOVAs were conducted to identify any significant differences among participants in the four clusters (Field, 2013). Tukey's post-hoc tests were used to follow-up any significant findings, as they are suitable for use with unequal group sizes and reducing type I error (Tabachnick & Fidell, 2013).

As the clusters were likely to contain small numbers of participants, the power to detect differences would be limited. Therefore, the strength of relationships between variables were also assessed using effect sizes, rather than relying on significant differences alone (Field, 2013). Cramér's V is used to determine the effect size in chi-square analyses with multiple degrees of freedom (Cramér, 2016). V values between .06 and .17 describe a small effect, V = .18 to .29 indicate a medium effect, and V greater than .30 imply a large effect. Effect sizes within ANOVA are represented by eta-squared

(η^2), with η^2 values between .01 and .06 indicating a small effect, η^2 values of .07 and .13 describing a medium effect, and η^2 values above .14 indicating a large effect (Cohen, 1988).

9.9.3.2. Qualitative approach

According to procedures already outlined (Study 2, section 6.3.3.), the transcripts were independently read by the researcher and three members of the supervisory team and analysed using thematic analysis (Braun & Clarke, 2006). Key themes were identified in the transcripts, without knowledge of the SPSS-determined cluster in which they were placed. After each of 18 transcripts were allocated to one of the clusters by each member of the research team, discussions took place to resolve any discrepancies where possible and an assessment of inter-rater reliability was undertaken. Inter-rater reliability was calculated using ReCal online software (Freelon, 2010). ReCal provides popular inter-rater reliability coefficients, including proportion agreement and Krippendorff's alpha (α). Of these, Krippendorff's α can be used with three or more coders, and is regarded as superior to proportion agreement, which does not correct for chance agreement among coders (Krippendorff, 2004). Excellent reliability between coders is achieved with $\alpha \geq .80$, with a minimum value of $\alpha \geq .60$ considered acceptable for exploratory studies.

9.9.9.3. Integration phase

In accordance with mixed-method processes (Creswell, 2014), both quantitative and qualitative data were then integrated into a coherent story to describe and explain experiences of PTG. The merged data were also summarised in matrices to transparently assess areas of convergence, discrepancy and silence among the data and clusters.

9.10. Results

9.10.1. Quantitative data screening and assumption testing

Data screening procedures were undertaken in the longitudinal data set. No missing data was present as replacement of missing values was undertaken in previous studies (see Study 1, section 5.6.1. and Study 3, section 8.5.1.). Box and whisker plots revealed outliers on the upper distributions of the age (N = 1), and T1, T3 and T4 number of event types variables (N = 3; N = 3; N = 7, respectively). The outliers were retained as upon exploration, the cases corresponded to individuals who reported ongoing IPV and serious health issues. Finally, Shapiro-Wilk tests indicated that the age, T1, T2, T3, and T4 number of event types, T3 and T4 PTS intrusions, T1 spirituality, T3 intrusive rumination and T3 centrality were non-normally distributed (all p < .05). The variables were not transformed as the skewness did not exceed an absolute value of 1.96 on any variable, and more importantly, to maintain the integrity of the data (Grayson, 2004).

The 16 nominal variables (see Table 19 for reminder of variables) satisfied the chi-square assumption of independence, with participants each contributing to only one cell of the contingency table (Field, 2013). Given the small sample size and analysis consisting of 2x4 contingency tables, some of the expected cell counts fell below the minimum of five required to provide a reliable chi-square estimate (Field, 2013). Therefore, the Fisher-Freeman-Halton extension of Fisher's Exact Test was used to determine the probability of the chi-square statistic in tables larger than 2x2 (Freeman & Halton, 1951). A series of 22 ANOVAs using an adjusted alpha value of p = .002 (.05/22) for multiple comparisons were conducted on the continuous variables (see Table 19 for reminder of variables) to assess whether there were any significant differences across the four clusters. All variances of the groups were the same (all p > .05), thus satisfying the assumption of homogeneity of variances (Field, 2013). Furthermore, the decision to use ANOVA in this context was justified as it is robust to deviations from normality and it

was used to compare differences rather than model variability as was the case in Study 4a (Tabachnick & Fidell, 2013).[58]

Table 19. *Categorical and continuous variables subject to preliminary testing.*

Categorical variables	Continuous variables
Female gender	Age (years)
White ethnicity	T1 number of event types
Heterosexual orientation	T2 number of event types
Single marital status	T3 number of event types
Religious	T4 number of event types
Disability	T1 PTG
T1 experienced event	T2 PTG
T2 experienced event	T3 PTG
T3 experienced event	T4 PTG
T4 experienced event	T1 PTS intrusions
Experienced event at any time point	T3 PTS intrusions
Experienced event at every time point	T4 PTS intrusions
T1 experienced interpersonal event	T1 spirituality
T2 experienced interpersonal event	T1 active coping
T3 experienced interpersonal event	T1 avoidant coping
T4 experienced interpersonal event	T1 emotional coping
	T1 social support
	T3 intrusive rumination
	T3 deliberate rumination
	T3 event centrality
	T3 present control
	T3 future control

Note. All categorical variables were dummy coded.

9.10.2. Preliminary analyses

The analysis revealed that a four-cluster solution best fit the data, producing a fair output (AIC = 120.79; average silhouette = 0.4).[59] Of the 42 participants, 6 (14.3%) fell into the *low PTG* cluster, 8 (19.0%) in the *increasing PTG* cluster, 16 (38.1%) in the *decreasing PTG* cluster, and 12 (28.6%) within the *high PTG* cluster. The ratio of the smallest to

[58] The non-parametric equivalent of the ANOVA (Kruskal-Wallis tests) were tested with similar results, and so the ANOVA was retained as it has greater power over non-parametric tests (Tabachnick & Fidell, 2013).

[59] Two and three cluster solutions were also considered (see Appendix XV). However, both solutions were poorer fits to the data, and it was felt they did not capture the variability of individual trajectories (see Figure 17 and Figure 18, Appendix XV).

largest cluster size was 2.67, indicating good fit. Figure 13 shows the course of the four trajectories after data integration was undertaken.[60]

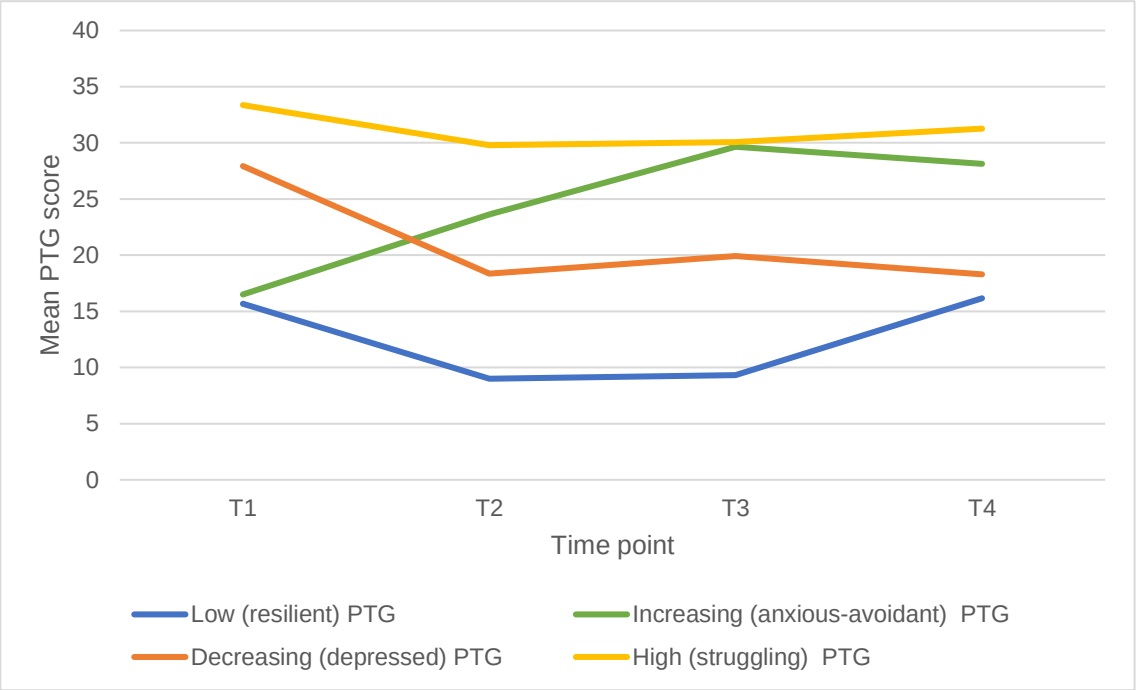

Figure 13. Four identified PTG trajectories after data integration.

Table 20 shows the descriptive data for the four clusters using demographic, event and psychosocial characteristics with post-hoc tests.[61] The clusters significantly differed in respect of PTG at all four time points, with cluster four reporting the most perceived growth at every time point ($p < .001$) and T1 emotional coping ($p < .001$). Medium to large positive effect sizes ($V = .18$ to $.37$; $\eta^2 = .09$) were observed for gender, age, sexuality, single marital status, identifying as religious, and having a disability. Ethnicity had a small positive effect size ($V = .17$). In respect of event characteristics, medium to large positive effect sizes ($V = .18$ to $.42$) were also observed for T4 experienced event, experienced event at any time point, experienced an event at each time point, and ever experienced an interpersonal event variable from T1 to T4. The large positive effect sizes for PTG ($\eta^2 = .25$ to $.49$) were expected as the clusters were formed on this variable. Small to medium positive effect sizes were observed for all other

[60] Appendix XV displays the four trajectories prior to the integration of the quantitative and qualitative data.
[61] Descriptive data for the four clusters *prior* to data integration is presented in Appendix XVII.

psychosocial and cognitive characteristics, with the exception of T4 intrusions and T1 emotional coping, which demonstrated large positive effect sizes (η^2 = .16 to .19).

Although the primary purpose of the current study was to assess convergence and discrepancies between quantitative and qualitative data, the transcripts were checked to ensure that the themes identified remained consistent with those provided in Study 2, section 6.4. Upon inspection, the three themes (and subthemes) were also apparent in the sample of 18 participants. The inter-rater reliability between the four coders was good (proportion agreement = 80.6%; Krippendorff's α = .74). When the ratings of the four coders were compared with the four clusters identified by SPSS, the agreement rate fell (proportion agreement = 70.6%; Krippendorff's α = .62), but was still suitable for the exploratory nature and aims of the study (Creswell, 2014; Krippendorff, 2004). The raw ratings of the coders are provided in Appendix XVIII.

Table 20. *Demographic, adverse event and psychosocial characteristics for four posttraumatic growth clusters after data integration.*

Characteristic	Low PTG (*N* = 6)		Increasing PTG (*N* = 8)		Decreasing PTG (*N* = 14)		High PTG (*N* = 14)		Test of difference	Post-hocs	Effect size
	N	%	*N*	%	*N*	%	*N*	%	χ^2		Cramer's *V*
Female gender	5	83.3	5	62.5	9	64.3	11	78.6	1.47	n.s.	.18
White ethnicity	4	66.7	6	75.0	12	85.7	10	71.4	1.23	n.s.	.17
Heterosexual orientation	5	83.3	6	62.5	9	64.3	11	78.6	1.47	n.s.	.18
Single	4	66.7	2	25.0	5	35.7	5	35.7	2.68	n.s.	.26
Religious	2	33.3	7	87.5	8	57.1	5	35.7	6.32	n.s.	.37
Disabled	0	0.0	0	0.0	1	7.1	0	0.0	4.80	n.s.	.24
T1 experienced event	6	100.0	8	100.0	14	100.0	14	100.0	-	-	-
T2 experienced event	2	33.3	5	62.5	7	50.0	7	50.0	1.19	n.s.	.17
T3 experienced event	1	16.7	2	25.0	4	28.6	5	35.7	.85	n.s.	.14
T4 experienced event	1	16.7	4	50.0	5	35.7	8	57.1	1.35	n.s.	.18
Experienced event at any time	3	50.0	5	62.5	9	64.3	7	50.0	.80	n.s.	.14
Experienced event at each time	0	0.0	1	12.5	0	0.0	5	35.7	10.17***	4 > 1; 4 > 2; 4 > 3	.45
T1 interpersonal event	4	66.7	5	62.5	11	78.6	8	57.1	1.57	n.s.	.19
T2 interpersonal event	0	0.0	2	25.0	5	35.7	2	14.3	4.92	n.s.	.30
T3 interpersonal event	1	16.7	1	12.5	0	0.0	1	7.1	2.98	n.s.	.23
T4 interpersonal event	0	0.0	2	25.0	2	14.3	7	50.0	4.80	n.s.	.47
Childhood adversity	4	66.7	5	62.5	8	57.1	8	57.1	.22	n.s.	.07

(cont.)

	Low PTG (*N* = 6)		Increasing PTG (*N* = 8)		Decreasing PTG (*N* = 14)		High PTG (*N* = 14)		Test of difference	Post-hocs	Effect size
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*		η^2
Age (years)	27.67	3.39	33.75	11.02	37.71	11.74	39.21	17.70	1.20	n.s.	.09
T1 number of event types	3.17	1.47	5.13	3.48	4.36	3.05	3.71	2.61	.69	n.s.	.05
T2 number of event types	.33	.31	1.38	1.69	1.14	1.46	.57	.85	1.31	n.s.	.09
T3 number of event types	.50	1.22	.25	.40	.29	.61	.50	.76	.30	n.s.	.02
T4 number of event types	.50	.54	.88	1.36	.64	1.34	1.21	1.21	.68	n.s.	.05
T1 PTG	15.67	9.69	16.50	4.96	27.93	7.16	33.36	9.45	11.14***	3 > 1; 3 > 2; 4 >1; 4 > 2; 4 > 3	.49
T2 PTG	9.00	7.67	23.63	9.55	18.36	7.16	29.79	7.76	5.14***	2 > 1; 2 > 3; 3 > 1; 4 > 1; 4 > 3	.29
T3 PTG	9.33	8.43	29.25	6.88	19.92	11.58	30.00	9.40	4.29***	2 > 1; 2 > 3; 4 > 1; 4 > 3	.25
T4 PTG	16.16	8.56	28.13	12.14	18.29	11.17	31.26	9.40	6.83***	2 > 1; 2 > 3; 4 > 1; 4 > 3	.35
T1 PTS intrusions	5.83	1.94	6.13	3.72	6.21	3.75	6.71	3.22	.12	n.s.	.01
T3 PTS intrusions	1.50	1.97	5.00	4.34	4.57	3.69	5.43	4.09	1.58	n.s.	.11
T4 PTS intrusions	.83	.98	5.38	4.34	3.57	3.44	4.50	3.03	2.48	n.s.	.16
T1 spirituality	31.67	26.40	35.38	19.78	31.85	17.41	38.79	23.36	.30	n.s.	.02
T1 active coping	17.33	4.63	16.47	5.86	16.50	5.61	18.86	4.50	.49	n.s.	.04
T1 avoidant coping	6.33	4.67	12.00	6.59	9.50	3.86	10.14	5.02	1.54	n.s.	.11
T1 emotional coping	9.00	4.98	9.63	3.96	8.57	4.77	13.36	4.43	4.00***	4 > 1; 4 > 3	.19
T1 social support	85.00	11.64	70.75	17.19	70.93	18.57	81.00	15.41	1.74	n.s.	.12
T3 intrusive rumination	9.83	6.97	16.38	10.47	13.86	10.34	14.71	9.14	.57	n.s.	.04
T3 deliberate rumination	11.83	7.65	16.38	9.27	12.50	7.76	16.00	7.99	.79	n.s.	.06
T3 event centrality	16.33	9.35	19.12	6.53	22.29	5.17	18.79	6.67	1.34	n.s.	.10
T3 present control	14.67	3.78	14.25	6.08	12.21	4.42	15.64	3.89	1.38	n.s.	.10
T3 future control	5.83	1.72	6.63	3.93	7.36	3.03	6.64	4.09	.39	n.s.	.03

Note. n.s. = not significant; *** $p < .001$.

9.10.3. Integration of mixed-method findings

To explore the characteristics of each cluster, self-report questionnaire and semi-structured interview data were considered equally for areas of convergence, discrepancy and silence (lack of any data). Ten examples of convergence and eight examples of discrepancy were found when comparing the two sets of data. No areas of silence were found. The integrated findings are discussed below and summarised from Table 21 to Table 24, along with PTG scores and example quotes from each participant. An overall summary of all four clusters after data integration is presented in Table 25.

9.10.3.1. Low PTG: The 'resilient' cluster

The characteristics of the *resilient PTG* group (*N* = 6) are summarised in Table 21. For most participants, PTG scores remained at the lower end of the PTG scale at all four time points, displaying a flattened 'U'-shaped trajectory. This cluster was the youngest of the four clusters, and endorsed the least number of events at the beginning of the study. The group reported a mixture of interpersonal and non-interpersonal events in both questionnaire and interview data. They also reported the fewest subsequent adverse events at any time point during the course of the study, compared to the other three clusters.

Participants acknowledged some positive changes, such as appreciation for life, increased confidence and new learning that had taken place from their prior experiences. However, these did not appear to result in significant changes to routines, career choices, activities or world views. Interestingly, some positive changes described by participants appeared to relate to personal growth in a broader sense, rather than solely arising as a direct result of their adverse experiences. These aspects included increasing maturity, and progressing their academic studies and professional careers.

At T1, the *resilient PTG* group reported the lowest levels of spirituality, avoidant coping and emotional coping, and the highest levels of active coping relative to the other three clusters. Interview data supported the quantitative evidence, with participants

describing psychological resources that they could draw upon to actively deal with the stressor; these were primarily focused around problem-focused coping and positively reframing the situation. In addition, the cluster often reported taking up support from family and friends, which was also echoed in the high social support score at T1. All participants were low in avoidant coping and spiritual beliefs, and comments endorsing either approach were generally not observed in the interviews.

At T3, the *resilient PTG* group self-reported the least rumination and centrality. Most participants commented that their experiences had not significantly changed or affected them in any way. This was supported by the finding that intrusive thoughts were at the lower end across this cluster. Rather, the cluster held optimistic views on life and their ability to recover and move forward from their adverse experiences. While some participants did report distress after the adverse event(s), they felt that this did not necessarily 'outweigh' any positive changes reported. This was endorsed by their relatively high perceptions of present control on the questionnaires, although they were lowest in respect of future control over adverse events happening again. In this regard, participants described the emotional intensity of their experiences becoming less acute over time, yet there was a realisation and acceptance that negative life events can occur, often outside of one's control.

The quantitative data for two participants (2 and 13) did not necessarily correspond with their interview transcripts. While displaying similar 'U'-shaped PTG profiles, self-reported growth scores were higher than the rest of the cluster. Participant two reflected that they still struggle to have conversations around feelings as it may trigger emotional memories of their own experiences. They believed it was emotional numbing (characteristic of the *anxious-avoidant PTG* cluster in which SPSS placed them), that enabled this individual to function relatively well in challenging times. However, they did not view their experiences as 'serious', and repeatedly echoed the idea that adverse events were a part of life, in-line with the rest of the *resilient PTG* group. Interview data also revealed coping strategies in place to deal with stress, such

emotional support from others. Participant 13 had a high score for centrality (a feature of the *depressed PTG* cluster), yet their interview disclosures suggested they had not changed as a result of their experiences. They also agreed with the views of close relatives that had seen them gain more maturity and independence after their physical assault. Therefore, while some characteristics of these two participants diverged from the majority of the group, most of their traits were similar to the *resilient PTG* individuals which led to them being placed in this cluster.

Table 21. *Characteristics of the low (resilient) PTG cluster after data integration.*

Participant number[a]	PTG scores at four time points[b]	Qualitative interview quotes	Convergence, discrepancy, or silence	Summary
1	14, 8, 9, 20	"I don't think my personality has changed that much. The things that changed were things that - the new experiences and the way that you look at the world. But the person still remains who you are."	Convergence	The *resilient PTG* group displayed a stable 'U' shaped trajectory. Growth and distress were not strongly endorsed in this group. The cluster did not appear to be significantly challenged by their various adverse experiences. Individuals already possessed coping skills to manage the stressor. PTG was largely framed in terms of personal growth, rather than as a result of an emotional struggle with adversity. The group saw adverse events as a part of life, rather than being defined by them.
2	28, 5, 28, 14	"I've always thought myself, things happen for a reason, things happen for the best - something will work out in the end. You can manage this, even if it's a difficult situation you will be able to come out of it."	Discrepancy	
12	9, 12, 19, 5	"I felt it was a major thing in my life. I knew after it happened, 'okay I'm going to remember this for the rest of my life'. But like I said, it's become a smaller and smaller problem as such, and I perceived it to be more of a little event, compared to at the time."	Convergence	
13	26, 18, 20, 16	"I think the assault has put a different perspective on things. I'm probably a bit more laid back which is different to how other people would go - they'd probably be more uptight and worried about things. I think I'm slightly more laid back than I was."	Discrepancy	

Note. [a] This reflects the participant groupings after consideration of both questionnaire and semi-structured interview data, rather than the original SPSS clustering.

[b] Maximum score is 50, indicating high PTG.

9.10.3.2. Increasing PTG: The 'anxious-avoidant' cluster

The characteristics of the *anxious-avoidant PTG* group (*N* = 8) are summarised in Table 22. The PTG trajectory generally showed a gradually increasing trend from T1 to T3 before a slight deceleration at T4. The members of this cluster were older than the *resilient PTG* group, with fewer reporting as single and a large proportion identifying as nominally religious. The *anxious-avoidant PTG* cluster experienced more events than the *resilient PTG* group, although a similar proportion experienced adversity in their childhood. A majority of the cluster also experienced an adverse event at one or more points during the study period.

Participants in this cluster endorsed positive changes that were mainly characterised by an increased focus on the management of negative symptoms. Negative changes included a lack of trust within interpersonal relationships and increased pessimism over their perceived lack of ability to cognitively process their experiences. For interviewees, this often coincided with other mental and physical health conditions, including a diagnosis of PTSD and chronic pain. There was a sense that positive changes were somewhat overwhelmed by negative thoughts and ongoing anxiety about the stressors, which corresponded with the relatively high centrality score. However, two participants reported that their multiple adverse experiences had encouraged a more 'hardy' attitude, which may have helped them to maintain some control over the intensity of their negative symptoms. While participants in this cluster appeared to reflect on negative changes to a greater degree in their interviews compared to the *resilient PTG* cluster, there was a sense that this was being matched by increased tolerance or acceptance of these negative changes.

The *anxious-avoidant PTG* cluster was characterised by high rumination. Scores for intrusive rumination and deliberate rumination were the highest of the four clusters, and intrusive thoughts were elevated at multiple time points. Within two of the interviews, participants described being held back by thoughts about the event (or events) that appeared to remain present for some time after it (or they) had occurred. However, the

other two interviews did not disclose any rumination, despite high scores on the ERRI and PTSD-8. This discrepancy may be explained by the presence of avoidance coping, discussed below.

Individuals in this cluster appeared to lack some of the psychological and social buffers against the negative effects of their adverse experiences compared to the *resilient PTG* and *struggling PTG* groups. At T1, *anxious-avoidant PTG* participants endorsed a notably high level of avoidant coping relative to all other clusters. This was reflected within interviews, where participants reported attempts to avoid thoughts associated with their experiences due to their distressing nature. Others were relatively ambivalent or numb towards their adverse event(s), which extended to other normative life events such as marriage or having children. It was also observed that three of the four interview participants were relatively flat in their presentation, with little emotional expression when discussing their experiences. This also appeared to hamper any attempts to understand the meaning behind their experiences, despite increasing PTG scores. Interview data suggested that participants were working around their symptoms, rather than through active or emotional-focused coping methods. Interestingly, all four interview individuals in the cluster reported that they were 'high achievers' and may have channelled some of their negative symptoms into academic study as a way of coping.

The *anxious-avoidant PTG* cluster endorsed a low level of social support relative to the *resilient PTG* and *struggling PTG* trajectories. Participants recalled negative or indifferent reactions to their disclosures from friends or family, and also felt a sense of disconnection or alienation from others, or an inability to accept professional help. They were therefore withdrawn from wider social networks through the actions of others, or through their own choice, with little opportunity to express feelings or receive emotional support.

Despite their aforementioned difficulties, the group endorsed similar levels of present and future control to the *resilient PTG* cluster. However, qualitative examination

revealed that this may be related to participants needing to exert or feel in control of their symptoms. Three of the interviewees felt it was important to try to maintain a ‘positive mindset’ due to the ongoing difficulties they still faced, or as a result of previous adverse events which were out of their control. This need for control was also echoed in other transcripts; for example, in describing their perfectionist tendencies, one participant related that ‘everything had to be perfect’ and they ‘would not accept anything less’.

There was inconsistency in the qualitative and quantitative data for Participant 3. Questionnaire responses suggested that this individual shared many characteristics of the *resilient PTG* group, such as having fewer adverse events and low centrality, with interview data revealing some optimism. However, interview data revealed that the participant had not taken steps to resolve feelings around their childhood abuse. They adopted avoidant behaviours, demonstrated most clearly through avoiding potential conflict situations at home and in work which they felt was attributed to their earlier life experiences. Given that this coping strategy featured prominently and there was a relative lack of other strategies in place, this participant was placed in the *anxious-avoidant PTG* cluster.

Table 22. *Characteristics of the increasing (anxious-avoidant) PTG cluster after data integration.*

Participant number[a]	PTG scores at four time points[b]	Qualitative interview quotes	Convergence, discrepancy, or silence	Summary
3	11, 24, 29, 20	"Since then, I've wanted to avoid conflict in situations. I think that's related to that. Anything at all similar - not just abusive towards me - any disagreements, I want to avoid that. Any situation where people disagreed or there's an argument, I avoid it."	Discrepancy	This cluster, in which PTG increased over time, was characterised by a great degree of rumination and intrusive thoughts. PTG was mainly associated with the management and control of negative symptoms and relatively little attempt to understand any positive meanings behind the experience. The group lacked strategies and social support to actively deal with their experiences and instead relied on avoidance coping. There was a sense that this cluster had not yet fully processed or were still coming to terms with their adverse events.
11	21, 16, 22, 32	"I think trying to tailor a career that I can do so I can work in and around my symptoms that feels less like something that I have to fight with in juxtaposition to the world. I can do that so I am employable and functional so that's good".	Convergence	
15	15, 26, 40, 36	"Other people would see that as very severe abuse, however, I feel quite numb towards it. I could be saying I went to Asda, and I bought something. That's how it feels for me to talk about it… I'm sort of ambivalent towards it all."	Convergence	
17	25, 20, 27, 44	"The way I am, I need that element of control - so it conflicts with my psyche, my ability to reason with everything… I'm supposed to be getting CBT to be able to manage it, to reduce the day to day stressors, coping strategies basically."	Convergence	

Note. [a] This reflects the participant groupings after consideration of both questionnaire and semi-structured interview data, rather than the original SPSS clustering.

[b] Maximum score is 50, indicating high PTG.

9.10.3.3. Decreasing PTG: The 'depressed' cluster

The characteristics of the *depressed PTG* cluster (*N* = 14) are displayed in Table 23. In the cluster, PTG generally displayed a decreasing longitudinal course over the study period. Almost two-thirds of the group reported experiencing an adverse event at any time point, similar to the *anxious-avoidant PTG* cluster group. Interviews revealed extensive childhood adversity as a result of physical and sexual abuse, also reflected in the high proportion of interpersonal events endorsed at T1. Two interview participants revealed co-morbid pathological symptoms, including an eating disorder and dissociate identity disorder which they attributed towards their negative life experiences.

Intrusive thoughts declined over time, although less so than the *resilient PTG* group. Rumination scores were also moderately elevated, but not to the extent of the *anxious-avoidant PTG* cluster. Interviews revealed that participants experienced lingering negative symptoms, such as difficulties expressing feelings, pessimistic views, low mood, and a lack of trust in other people. In their view, this 'inhibited' PTG, although all participants reported some positive changes. These changes included a view that other stressors (e.g. moving to a new house, financial difficulties) were trivial compared to their own adverse experiences. Alongside this, two interview participants believed they were more open-minded and less judgemental of other people, whilst another interviewee felt they were now more assertive.

A defining characteristic of the *depressed PTG* group was the high centrality score, reported at T3. There was a sense that participants were grieving for their old lives, or had made attempts to 'reinvent' themselves. This was evidenced by references to life before the adverse event, or the creation of a new identity to create distance between themselves and their negative life experiences, such as adopting a new name or moving away. In two cases, experiences appeared to have consumed participant's own sense of identity, with growth predominantly framed as 'getting back' at those who had perpetrated abuse in the context of interpersonal acts. Two other participants

expressed anger and frustration about their experiences. Adverse events were therefore central to these survivor's perceptions of self-identity and subsequent adjustment.

Like the *anxious-avoidant PTG* group, the *depressed PTG* cluster lacked psychological coping and social buffers against distress. The group did not endorse any particular T1 coping strategy to a high degree; the cluster had near-identical average active coping scores to the *anxious-avoidant PTG* cluster although there was no supporting qualitative evidence. In addition, the *depressed PTG* cluster were the lowest of the four clusters in respect of social support. Two interview participants suggested that they were less confident after their experiences and were socially withdrawn from friends, family or professional networks.

The *depressed PTG* cluster recorded the lowest levels of present control, although somewhat paradoxically, future control was highest for this group. The cluster described being 'held back' by their experiences, with events being perceptively out of their control. At the same time, three participants suggested they were now 'taking steps' towards becoming more independent, which was in marked comparison to their psychological functioning in the immediate aftermath of their experiences. It was not possible to fully assess the discrepant future control finding, as no comparable qualitative data was found.

The qualitative data for Participant 14 partially diverged from the questionnaire data, as the former revealed that they drew upon avoidant strategies like the *anxious-avoidant PTG* cluster. However, the same participant acknowledged their current functioning was strongly influenced by prior experiences of rape and sexual abuse, rather than distancing themselves from the event like the rest of the *anxious-avoidant PTG* group. PTG scores also suggested a trend of decreasing growth over time. Quantitative data for Participant 16 was elevated at all time points, consistent with the *struggling PTG* group and SPSS-defined cluster. However, their transcript did not provide any qualitative evidence of an ability to cope with their adverse experiences; rather, the participant

repeatedly identified with their experiences, speaking of ‘defiance’ against the alleged perpetrator and how the adversity subsequently defined their life course as a result. Both of these participants were thus reclassified under the *depressed PTG* cluster.

Table 23. *Characteristics of the decreasing (depressed) PTG cluster after data integration.*

Participant number[a]	PTG scores at four time points[b]	Qualitative interview quotes	Convergence, discrepancy, or silence	Summary
6	35, 25, 5, 17	"I mean, I've been forced to move away and start a new life in the physical sense, and I guess I've kind of re-invented myself in this new career that I'm pursuing. I certainly have a new outlook on life and now do things very differently."	Convergence	The PTG trajectory declined over time for this cluster. The group experienced multiple adverse events, primarily in childhood, which still troubled the cluster through a range of negative symptoms. The adverse event was central to the identity of this cluster, becoming a reference point in their life stories and influencing their longer-term psychological adjustment. There was a lack of positive coping strategies that were focused on reducing the distressing aspects of the stressor. The cluster also evidenced poor social networks and low present control over their recovery.
7	30, 24, 10, 23	"I thought I would change if I changed my name. I would say I'm more of a realist, but in a way I'm more of a pessimist. I still try and believe things will get better, but there's still the underlying reality and the underlying pessimist. I beat myself up over everything. I always think something bad is gonna go wrong."	Convergence	
8	33, 18, 19, 28	"I'm probably a pessimistic person. It's hard for me to see... the positives in my life. That is because of the way I was brought up, you know. I was told that I was bad, I was told that I was ugly, I was told that I was not good at anything. I'm starting to see the opposite side of that."	Convergence	
14	19, 9, 14, 2	"I feel like I'm a 'work in progress'. I've grown quite a lot, but I've still got a few things to address. I'm still held back so much by what happened and it still controls a lot of my life. Until then, I don't feel like I have control over things."	Discrepancy	
16	43, 31, 33, 34	"I actually don't think I've changed as a person at all. But what's changed has been my circumstances... and the fact that in someone trying to destroy me, I've actually focused more on what I want in my life and worked towards it relentlessly. So maybe my eyes have been opened… I am a good bloke and I will not be defeated."	Discrepancy	

Note. [a] This reflects the participant groupings after consideration of both questionnaire and semi-structured interview data, rather than the original SPSS clustering.

[b] Maximum score is 50, indicating high PTG.

9.10.3.4. High PTG: The 'struggling' cluster

The characteristics of the *struggling PTG* cluster (*N* = 14) are presented in Table 24. The *struggling PTG* trajectory remained relatively stable and elevated at all four time points for the majority of participants in this cluster. This cluster had the oldest mean age of all four trajectories, and approximately half of the group experienced further events during the study period, with the most of all trajectories at T4. While a smaller proportion of the *struggling PTG* trajectory reported fewer interpersonal events at T1 relative to the other three trajectories, half of the cluster endorsed interpersonal adversity at T4.

The *struggling PTG* cluster recorded a great number of positive and negative changes. Positive changes included an increased appreciation for life, greater optimism, being open to new experiences and a greater sense of compassion for other people. One common feature was altruistic tendencies. While the extent to which an individual's adverse experience had become central to their identity varied in this cluster (evidenced by a range of centrality scores), three interviewees revealed they had used their experiences to help others who were experiencing adversity. At the same time, negative changes were prevalent among the cluster, with interviewees reporting ongoing self-doubt about their ability to recover from events, viewing the world as a 'dangerous' place, and recent suicide attempts.

Intrusive thoughts were elevated compared to the *resilient PTG* cluster, and were the highest endorsed at T1 compared to all four groups. Intrusions marginally declined at T3 and T4 but still remained high, supported by high T3 intrusive and deliberate rumination scores. Although only two participants noted that they were still experiencing nightmares and flashbacks, all interview participants were still contemplating their experiences and demonstrated insight into specific thought patterns that were inhibiting their growth. For example, interviewees described their focus on 'obsessive' thoughts that kept them 'stuck' in a cycle of negative rumination, and which they currently trying to understand.

Unlike the *anxious-avoidant PTG* and *depressed PTG* trajectories, the cluster could draw upon coping and social resources in response to their adverse experiences. Notably, individuals in this cluster endorsed religious or spiritual beliefs to a greater degree than other clusters on the self-report measures and within interviews. For example, one participant described how these beliefs had enabled them to perceive situations in a different light or find new meaning. Another participant related how their faith in God was challenged, yet this provided them with comfort. The cluster also had the highest average score for active coping at T1. One participant spoke of 'compartmentalising' thoughts about the stressor so as to ameliorate its effects. In addition, the *struggling PTG* cluster had elevated scores for avoidance, although not to the extent of the *anxious-avoidant PTG* trajectory. Interviews corresponded with the questionnaire data; three participants described denying thoughts about their adverse experiences as a 'self-defence' strategy to minimise distress. Emotional strategies were also favoured, evidenced by the highest score for emotional coping of all four clusters. The cluster generally engaged in expressive and creative activities which they said helped them to cope with the adversity. Interviewees revealed mixed findings in respect of social support. Three participants felt stronger relationships with some people, and two interviewees were currently accessing therapy. However, four interviewees also reported that their adverse experiences had 'fractured' close relationships with partners, family and friends.

The *struggling PTG* trajectory also recorded the highest present control score of all four clusters. For two interview participants, control appeared to be related to maintaining a sense of stability, rather than control over their recovery. One interviewee noted that they became more controlling externally when 'things get chaotic internally', with reference to their lingering negative symptoms. Finally, scores for future control were near-identical to the *anxious-avoidant PTG* cluster. Qualitative data revealed contradictory findings for the trajectory; on one hand, participants reflected that multiple brushes with adversity had emboldened their perception of being able to manage with

future events, yet the same individuals also recognised the negative impact of their experiences on their psychological and social functioning, and were not necessarily focused on the future.

The integrated data for participants 4, 10 and 18 revealed partial discrepancies. Participant 4 described traits characteristic of the *resilient PTG* and *anxious-avoidant PTG* clusters, reporting a greater acceptance of adversity as a part of life, and some avoidant symptoms, respectively. Furthermore, PTG scores did not follow the elevated and stable trend of the remainder of the cluster. However, the same participant endorsed spiritual beliefs which helped them find a sense of purpose and meaning in their experiences, contrary to the rest of the *resilient PTG* cluster. They also reported a high degree of social support and optimism, unlike the *anxious-avoidant PTG* cluster. Participant 10 evidenced centrality which was characteristic of the *depressed PTG* trajectory, yet unlike that cluster, they described features of emotional coping through creativity and altruistic tendencies which they felt mitigated against the events. Finally, while all coders classified participant 18 in the *struggling PTG* cluster, SPSS-determined clusters placed this participant in the *depressed PTG* group. Qualitative data revealed that this individual felt optimistic, and endorsed a number of positive changes including increased empathy and forgiveness, unlike the *depressed PTG* individuals. Additionally, consideration of all quantitative scores indicated high active coping, social support and spirituality which were characteristic of the *struggling PTG* cluster. On the basis of the above, these three participants were placed in the *struggling PTG* trajectory.

Table 24. *Characteristics of the high (struggling) PTG cluster after data integration.*

Participant number[a]	PTG scores at four time points[b]	Qualitative interview quotes	Convergence, discrepancy, or silence	Summary
4	12, 17, 37, 24	"The Buddhist culture is very peaceful and I think there are lessons to be learned from it. I wouldn't say I am a religious person, but I would say that you I kind of have certain beliefs and attitudes about things, and how you should appreciate one another and be positive and things like that."	Discrepancy	Individuals in the *struggling PTG* cluster generally displayed a stable and elevated growth trajectory. The group experienced multiple events, of which a large proportion were interpersonal in nature. The cluster endorsed a range of active, avoidant, emotional and spiritual coping methods, and benefitted from social support. A wide range of co-occurring positive and negative changes were also reported, including mixed perceptions of centrality, present and future control.
5	39, 33, 32, 38	"Growth happened to me only because I was surrounded by strong and positive people… I had to push down my pain… I am optimistic but I do need help for that, may be from my brother or from my friends, or some books. Now I make a point to do something to keep myself feeling positive."	Convergence	
9	47, 20, 34, 24	"I can always see light at the end of the tunnel, even if I'm having a bad day. I'm like "well God must be doing this for the greater good or some purpose". I was having mind-blowing religious experiences and even though I was unhappy, psychotic and suicidal, I had a content part to me too."	Convergence	
10	25, 24, 27, 13	"I found that the way to deal with anything was through creativity. So, I was always doing that, but I think it forced me to do it in a much more radical fashion."	Discrepancy	
18	23, 11, 27, 33	"I thought no matter what, everything's going to get better. But it was an unrealistic expectation... the future…I know if I just wait, this too shall pass. It's just a matter of hanging on until this storm goes by and it will go by and things will get calm again."	Discrepancy	

Note. [a] This reflects the participant groupings after consideration of both questionnaire and semi-structured interview data, rather than the original SPSS clustering.

[b] Maximum score is 50, indicating high PTG.

Table 25. *Key features of all four PTG clusters after data integration.*

Low (*resilient*) PTG	Increasing (*anxious-avoidant*) PTG	Decreasing (*depressed*) PTG	High (*struggling*) PTG
• Growth was low and stable, displaying a 'U' shape • Experienced few adverse events compared to other clusters • PTG and PTS were not strongly endorsed • Not significantly challenged by experiences • People had psychological coping and social support resources in place • Viewed adverse events as a part of life • Growth framed in general terms, rather than as a result of the struggle with adversity	• Growth increased over time • Experienced adverse events primarily in childhood • High in intrusive and deliberate rumination • Lacked positive coping strategies or social support • Relied on avoidant coping strategies, denial and numbing • High control associated with attempts to manage negative symptoms	• Growth declined over time • Experienced multiple childhood events • Lacked any positive coping strategies • Event(s) had become a key part of the person's identity • Poor social support but high future control perceptions	• Had a stable and elevated growth trajectory • Experienced the most events in childhood and adulthood compared to other clusters, mainly of an interpersonal nature • Reported a wide range of positive and negative changes • Endorsed a range of active, avoidant, emotional and spiritual coping methods • Received high levels of social support • Mixed perceptions of centrality and control

Note. See Figure 13 for visualisation of these clusters.

9.11. Discussion

This was the first PTG study that used both quantitative and qualitative data to comprehensively explore experiences of growth over an 18-month period in people who exposed to multiple types of adverse events. The current research had two aims: first, the study investigated whether there were distinct trajectories of PTG that emerged over time following exposure to adversity. Second, the study evaluated the extent to which quantitative data provided throughout the study and interviews given halfway through the study were able to indicate the quality of growth experienced after 18 months. Four PTG trajectories emerged (*resilient PTG*, *anxious-avoidant PTG*, *depressed PTG*, and *struggling PTG*) which appeared to reveal survivors experiencing various forms of positive and negative adaptation following adversity.

9.11.1. Trajectories of posttraumatic growth

This study makes an important contribution to the longitudinal PTG literature, which has predominately focused on identifying average growth trajectories (e.g. Danhauer et al., 2015; Dekel et al., 2012), but does not differentiate between various levels of growth (see section 9.7.1.). *Resilient PTG* individuals were less challenged by events and reported minimal growth and distress. This is consistent with the idea that the adverse event should be seismic enough in order to trigger a rebuilding of a person's assumptive world (Tedeschi & Calhoun, 2004), and mirrors findings in other research (Danhauer et al., 2015; Morgan & Desmarais, 2017). Thus, an event that is not perceived as severe may not require the effortful rumination needed to trigger PTG. The *anxious-avoidant PTG* trajectory was characterised by avoidant thoughts and behaviours, intrusive and deliberate rumination. Common to cognitive (Ehlers & Clark, 2000) and emotional processing theories (Horowitz, 1997) of PTSD, and the ACPM (Joseph et al., 2012), high levels of avoidance and rumination can indicate a failure to process memories related to the adverse experience. Consistent with the Study 1b childhood adversity reverse mediation model (see Appendix VI), childhood adversity was

experienced by a large proportion of this trajectory. Adversity in childhood could explain links with higher avoidance in adulthood due to higher cortisol levels impacting on brain neuroplasticity and development (Lupien et al., 2009). However, self-reported PTG increased for this trajectory over time. It is suggested that the co-existence of distress with deliberate attempts to think about the event can indicate a self-enhancing coping strategy, at least in the short-term (Zoellner & Maercker, 2006). Thus, these trajectories support the premise that some degree of distress is needed for PTG to occur, although growth that is accompanied with avoidance and rumination may reflect illusory aspects of PTG. This suggests that distress needs to be both seismic but not overwhelming in order for growth to occur, and further supports curvilinear relationships discussed earlier in this thesis (see Chapter 2, section 2.7.2.; Study 4a, section 9.6.1.).

The present study found two other trajectories that did not correspond to the idea that growth increases over time (Tedeschi & Calhoun, 2004). *Depressed PTG* individuals strongly identified with their adversity and lacked coping resources. They also showed a declining PTG course over 18 months. Consistent with other longitudinal research that has observed a decreasing trajectory (Tsai et al., 2016; see section 9.7.1.), the cluster had a history of multiple events and few protective psychosocial characteristics, such as social support. It is possible that PTG may decline in the absence of specific factors that can sustain growth, such as coping and rumination identified in prior studies in this thesis (see studies 1, 2 and 3) and other literature (e.g. Calhoun, Cann, & Tedeschi, 2012). Interestingly, the *depressed PTG* trajectory also showed the highest score for future control compared to the other three trajectories. Future control is often construed as control over future events (Frazier, et al., 2002). It may be that in this trajectory, future control could serve a palliative function as a way to hold out some hope against the distress they are experiencing, or represent an exaggerated sense of control to try and cope with events (Nadelhoffer & Matveeva, 2009; Taylor & Brown, 1988; see Chapter 2, section 2.6.2.1.).

Finally, the *struggling PTG* trajectory group had an elevated growth trajectory also observed in recent research (Morgan & Desmarais, 2017; Pat-Horenczyk et al., 2016), with a high degree of co-occurring positive and negative changes such as an increased appreciation for life and ongoing self-doubt. It is possible that positive and negative changes in cognitions and affect may provide evidence of illusory and constructive PTG. The presence of negative changes, such as avoidance, could characterise growth as an illusory buffer against stress, although the fact that positive coping strategies were also reported may imply more constructive forms of PTG. To date, it has been assumed that illusory PTG occurs only in the presence of avoidance or pathological symptoms (Zoellner & Maercker, 2006), although the present study appears to suggest this can co-occur alongside constructive growth. Alternatively, the findings may indicate a more balanced and realistic world view in which positive changes increase alongside the recognition of one's own vulnerability (Tedeschi & Calhoun, 2004). An absence of protective psychological factors may therefore impede PTG, although positive coping mechanisms, social networks and control perceptions can aid the recognition of positive and negative changes that may sustain growth.

9.11.2. Factors indicative of constructive and illusory growth

A second aim of the study was to determine the extent to which quantitative data collected at four time points and interviews at T2 could provide a good indicator of the quality of growth experienced at a later time point. Generally, event characteristics, centrality, avoidance coping and control perceptions could not be clearly differentiated among clusters. The study found stable (*resilient PTG* and *struggling PTG*) and changing (*anxious-avoidant PTG* and *depressed* PTG) trajectories regardless of the number or types of events experienced. For example, *resilient PTG* and *struggling PTG* both displayed stable growth trajectories, yet the latter experienced far more adverse events than the *resilient PTG* group. Distress from multiple adverse experiences may lead some people to constantly rebuild core beliefs, thus sustaining growth (Tsai et al., 2016) or reflect an avoidant coping strategy that minimises distress associated with frequent

exposures (Lahav et al., 2016). However, the findings of Study 1 showed that psychosocial factors can influence PTG over and above event characteristics, further supported by prominence of psychosocial variables within Study 2 interview data (see Study 2, section 6.4.). Therefore, the characteristics of adverse events experienced did not appear to determine subsequent PTG trajectories across the 18-month period, suggesting that internal psychological factors matter more than external circumstances.

Interview and questionnaire data for event centrality did not always converge. Events that are central to an individual's identity have been described as a 'double-edged sword' (Boals & Schuettler, 2011, p. 818) which entails both distress and PTG, demonstrated in the findings of studies 2 and 3 (see Study 2, section 6.4. and Study 3, Figure 8). Given that centrality is associated with both pathogenic and salutogenic outcomes, this variable considered in isolation is not able to effectively differentiate among the quality of growth. Furthermore, associations between centrality and PTG have been found to decline over time (Blix et al., 2015), which indicates that in the short-term, construing an event as central to one's identity may function as a compensatory strategy to mitigate distress. Event centrality alone is not necessarily a good indicator of PTG trajectories after 18 months, and a distinction may need to be drawn between functional and non-functional aspects of centrality given its relationship with growth and distress.

The divergent quantitative and qualitative evidence for avoidance and control perceptions may be explained through positive illusions experienced by some survivors (see Chapter 2, section 2.6.2.1.). Paradoxically, avoidant individuals may share characteristics with resilient individuals, such that they appear (at face value) to have a tolerance to stress and few negative symptoms (Carver, 1997; Connor & Davidson, 2003). Thus, avoidance may be wrongly interpreted as resilience (or vice versa) within quantitative data, which lacks the wider context afforded by qualitative methods (see Chapter 4, sections 4.2. and 4.3. for discussion). Turning to control perceptions, early research has found that people often adopt distorted self-perceptions following adversity,

including an exaggerated sense of self-control (Taylor, 1983). Control perceptions have been positively associated with avoidance in people with high exposure to adverse events (Maercker, Herrle, & Grimm, 1999). It may be that heightened perceived control reflects the illusory aspect of PTG, evidenced by the *depressed PTG* trajectory, as people attempt to maintain a semblance of control over events. Therefore, avoidance and perceived control may not necessarily provide reliable indicators of people's future growth trajectories.

For most people, responses in the interviews and questionnaires were consistent for the rumination, active coping, emotional coping and spirituality variables throughout the study. Studies 2 (section 6.4.2.1.) and 3 (see Figure 8), and existing research (Cann et al., 2011; Stockton et al., 2011) have implicated both intrusive and deliberate rumination in PTG development (see Chapter 7, section 7.3. for discussion). It is argued that greater engagement with thoughts about the adverse event reflects the constructive side of PTG, as there are intentional attempts to process the stressor (Zoellner & Maercker, 2006). It was observed that questionnaire and interview data for the active coping and spirituality converged for the vast majority of people in the sample. Both constructs have been consistently and positively associated with PTG (Helgeson et al., 2006; see Chapter 2, sections 2.7.1.1. and 2.7.1.4. respectively) and are also likely related to the constructive side of growth, due to the rebuilding of beliefs and the search for meaning (Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). Furthermore, questionnaire scores for emotional coping corresponded with increased creativity and social support reported in interviews. This is consistent with the nature of emotional coping as a means to express oneself and seek support (Larsen & Berenbaum, 2015). These findings thus extend knowledge of factors that may relate to the constructive PTG (Zoellner & Maercker, 2006), as they share a focus on making sense of the adverse experience. People who provide consistent responses on questionnaires and interviews for rumination, active coping, emotional coping and spirituality over an 18-month period may provide a clearer indicator of constructive PTG in the future.

9.11.3. Strengths and limitations

While the study provided an in-depth examination of PTG trajectories, it is important to note that the trajectories identified here only speak to adjustment in survivors *following* adverse events. This research, along with others (see section 9.2.), is unable to offer insight into the psychological functioning and PTG among individuals before T1, which may have influenced the trajectories. It is therefore not possible to obtain 'true' baseline measures of PTG without sampling individuals before their first encounter with adversity, and at timepoints thereafter. Thus, PTG in Study 4b (and Study 4a) is effectively treated as an *outcome* variable post-event from T1 onwards, rather than as a 'starting point' for their growth.

Another limitation was the small sample size after T1, which prevented more detailed or sophisticated quantitative analysis of the data. Conclusions from this study are therefore tentative pending further empirical inquiry, although the study is intended to be a preliminary investigation. With the exception of PTG, PTS and adverse event history, interviews and questionnaires measuring coping, social support and cognitive factors were not repeatedly administered to assess changes over time. However, the analyses were appropriate for the exploratory nature of the investigation, which had the advantage of two data sources to contextualise the survivors' experiences in great depth. Interview data provided at T2, along with quantitative data from T1 to T4, was used to identify future trajectories at T4. This means that it was not possible to qualitatively support whether constructive or illusory PTG had occurred at the final time point, which may have benefited from further investigation of tangential changes, such as employment and sick days, for example. Yet, the use of qualitative data to provide an indicator of later PTG trajectories goes beyond existing mixed-method PTG research which only provides a snapshot of current functioning (Beck et al., 2017; Kuenemund et al., 2016; Vanhooren et al., 2015). At the same, the researcher did not want to place undue burden on participants by administering large questionnaire batteries and

interviews every six months, which can increase sample attrition further (Porter, Whitcomb, & Weitzer, 2004).

9.11.4. Implications

In the first longitudinal mixed-method PTG study of its kind, the study identified four trajectories of PTG that share some distinct and some overlapping characteristics. The flexible approach to data collection not only enabled a detailed exploration of the levels and quality of PTG experienced, but also generated new hypotheses for future testing. The research was also the first to examine the ability of quantitative and qualitative data gathered at different time points to help inform PTG trajectories across the timeframe of the study. Furthermore, the study went beyond existing research (Pat-Horenczyk et al., 2015, 2016) by extending criteria to identify the constructive and illusory aspects of PTG. In doing so, it highlighted areas of data corroboration that would support actual accounts of growth as an outcome, and areas of divergence between qualitative and quantitative trajectories which may reflect PTG as a process or coping strategy.

The findings have implications for PTG theorists and practitioners. The study adds to a small body of literature (Danhauer et al., 2015; Tsai et al., 2016) that finds growth does not always increase over time, as previously argued (Tedeschi & Calhoun, 2004). Using mixed data sources in a longitudinal PTG study for the first time revealed that psychological coping, cognitive and social resources can influence the type *and* quality of growth experienced, thus providing empirical support to the JFM (Maercker & Zoellner, 2004). The findings also have clinical value, in that the study identified factors that could potentially distinguish between illusory and more constructive forms of PTG. It may be advantageous for practitioners to look for corresponding information from their client's disclosures, psychometric scores and changes in behaviours (Hobfoll et al., 2007) when determining if *actual* PTG has occurred, rather than taking reports of positive change at face value. This could include opportunities to observe PTG 'in action', for example, through altruistic gestures and increased self-efficacy, to evidence that growth

has led to demonstrable improvements in well-being. Therefore, the findings suggest that if the qualitative and quantitative data converges for clients, the survivor has cognitively engaged with the event and demonstrated tangible changes in their behaviour that reflect *actual* PTG. In contrast, if qualitative and quantitative data for any particular individual diverges, this may indicate that any positive changes should be regarded cautiously as this could imply *illusory* growth. Further exploration may be needed in these cases on the part of the practitioner to understand the function that PTG is serving for the client, such as minimising distress.

9.12. Chapter summary

The two longitudinal studies presented offer insight into the factors associated with PTG over time. Study 4a and Study 4b both revealed that longer-term changes in PTG can fluctuate considerably over time, displaying heterogenous and non-linear trajectories. Intrusive thoughts may vary among participants, such that some react to adverse events with great distress and little PTG, others respond with heightened PTG and little distress, and yet others display no growth or distress. Study 4a indicated great variability in people's PTG trajectory over 18 months, and so this idea was followed up in Study 4b, which found that long-term changes in growth appear to be influenced by a wide range of cognitive and psychosocial factors which help people to understand their adverse experiences, as opposed to the characteristics of the events themselves. Importantly, the studies not only reveal that trajectories of growth can differ according to the level of PTG experienced, but they also highlight that the quality of PTG can change over time. In this regard, relations between growth and other factors could illuminate the constructive and illusory aspects of PTG in more depth, which may or may not relate to long-term improvements in well-being, respectively. Thus, the processes and outcomes associated with the progression of PTG over time are complex and highly individualised.

CHAPTER TEN: General Discussion

10.1. Chapter introduction

This chapter will conclude the thesis by presenting a general discussion of the main findings and their unique contribution to the PTG literature. The chapter will begin by restating the key aims and objectives of the thesis and summarising findings arising from each of the preceding empirical studies. Next, the findings will be considered in respect of their theoretical and applied contributions, and implications for existing knowledge in this area. Finally, the strengths and limitations of the thesis will be discussed along with suggestions for future research.

10.2. Summary of the thesis and main findings

As the thesis aims and findings have been discussed in more detail in their respective chapters, this section will therefore only briefly restate the main arguments and findings from each chapter. Chapter 2 highlighted gaps in knowledge in respect of the psychological *processes* and *outcomes* associated with PTG following multiple adverse events. It was evident that PTG still remains a poorly understood concept with regards to relationships with event characteristics, distress, and the nature or function that growth serves over time. In addition, there was a need for more qualitative and longitudinal investigations of the construct. Therefore, a flexible and inclusive methodological approach was adopted in which the subsequent empirical studies included people exposed to multiple and wide-ranging adverse events.

The primary focus of the thesis, outlined in Chapter 3, was to understand and explore the process and outcomes associated with PTG. This would be tested through a mixed-method approach described in Chapter 4 (section 4.4.), beginning with the extent to which PTG is related to the characteristics of events experienced, through to attempts to process the event, and the nature of any long-term positive or negative

changes that may occur. The overall aim was deliberately broad to ensure that the thesis naturally evolved from the findings in each preceding study.

Study 1 addressed a gap in the research literature by exploring relationships between adverse event characteristics and PTG among individuals with varying adversity exposures. Study 1a examined whether the characteristics of the adverse event predicted PTG alongside psychosocial factors in three samples exposed to different types and frequencies of adverse events. Different psychosocial factors were found to predict PTG across the three samples, while event characteristics did not directly predict growth in any sample. Therefore, Study 1b examined whether event characteristics were indirectly related to PTG through mediating psychosocial variables. It found that avoidance coping, intrusive thoughts and social support explained relationships between event characteristics and PTG. Taken together, it was concluded that while event appraisals were stronger determinants of growth than the events themselves, event characteristics can shape emotional responses to adversity conducive of growth.

Study 2 contextualised the findings of Study 1 by providing an in-depth account of the PTG experiences of 26 survivors exposed to multiple and wide-ranging adverse events. Semi-structured interviews revealed that the PTG process is a highly complex and individualised experience, with three overarching themes of *experiencing adversity, processing adversity* and *outcomes of adversity* identified that provided greater insight into how people experience growth. This study was the first to provide an in-depth investigation of the process of PTG among a diverse range of people, confirming that PTG is not a solely positive phenomenon.

Following on from the qualitative findings in Study 2, Chapter 7 reviewed the literature on cognitive processing, noting a lack of application to PTG research. Study 3 therefore operationalised key cognitive themes from the Study 2 interviews, uniquely combining these within the CGAS model to explain why some people are more likely to

report growth or distress than others. This model summarised complex relations between cognitive processing factors, identifying shared and unique pathways towards PTG and PTS.

Finally, in response to limited longitudinal studies, Study 4 provided an examination of the temporal course of PTG. Study 4a assessed whether event characteristics and intrusive thoughts could determine changes in reported PTG over an 18-month period. The findings revealed that intrusive thoughts predicted changes in the average PTG trajectory while the type and frequency of adverse events did not. These findings were further contextualised in Study 4b using mixed-method data, which explored the extent to which a broad range of psychosocial and cognitive variables could influence subsequent PTG trajectories over 18 months. Four growth profiles were revealed which differed in event characteristics, psychosocial and cognitive factors, and the types of illusory or constructive growth experienced. Overall, the chapter findings suggest that PTG is variable over time depending on a wide range of individual differences.

10.3. Theoretical contribution of the thesis to existing knowledge

Chapter 3 (section 3.2.), presented five research questions that the thesis set out to investigate. The key findings in respect of these questions are discussed below, along with their contribution to existing knowledge on PTG.

10.3.1. Existing PTG theories require expansion and revision

One aim of the thesis was to assess whether existing PTG models account for the experiences of individuals following adverse events. Currently, the literature relies on primarily cognitive processing models that are largely based on clinical experience rather than empirical validation. While extensions to the FDM have been proposed (Calhoun et al., 2010), and the ACPM addresses socio-environmental factors in more detail, these frameworks are by no means comprehensive. Some of the key characteristics of growth emphasised in the aforementioned models were not relevant, whilst other factors critical

to the PTG process have not been fully recognised. For example, Study 2 suggested that faith and religion could be detrimental to, or decrease, as a result of growth, while Study 3 identified centrality and control perceptions as components of PTG adjustment. These nuanced findings are not routinely addressed in the literature (e.g. Schultz et al., 2010; Shaw et al., 2005; Tedeschi & Calhoun, 2004) and are overlooked within existing PTG models. Indeed, the results from this thesis suggest that people are remarkably adaptive in the face of adversity, and will use whatever resources are available in their environment that enable them to cope. This idea chimes with prior literature (Hobfoll, 2002; Murrell & Norris, 1983; Tzipi Weiss, 2005) which acknowledges the benefits of having access to resources such as personal characteristics (e.g. optimism) and conditions (e.g. supportive home environment) that are beneficial to psychological adaptation. Therefore, despite literature highlighting key individual differences in PTG (Yeung, Lu, Wong, & Huynh, 2016), this is still not acknowledged within models. This thesis has therefore emphasised other key areas (such as the social environment) where people differ which may explain why people report different levels and quality of PTG following life challenges.

More broadly, the thesis findings call for a more integrated understanding of factors that lead to more or less PTG. Existing literature has so far sought to expand knowledge of cognitive and psychosocial factors and their relationship to growth, although it may be more informative for existing PTG theories to account for risk/vulnerability and protective factors that better reflect the heterogeneity of responses (Bonanno & Mancini, 2012). Developmental literature has argued for some time that adjustment following adverse life events results from a cumulative mix of individual and socio-contextual risk and protective factors (e.g. Rutter, 1985). Risk and protective factors have been widely discussed in the context of PTSD (Brewin, Andrews, & Valentine, 2000; Schumm et al., 2006), but this language has not yet been extended to PTG development. Adopting this approach could shift somewhat simple conceptualisations of ‘PTSD versus PTG’ towards a more holistic understanding of the

factors that inform both positive and negative change, in line with the aims of positive psychology (see Chapter 2, sections 2.2. and 2.3.2.).

10.3.2. Event characteristics can influence psychosocial processes that facilitate or inhibit posttraumatic growth

A second question this thesis addressed was the relationship between event characteristics and PTG. The FDM, ACPM and JFM emphasise subjective appraisals of the adverse event in determining the degree of PTG experienced (Tedeschi & Calhoun, 2004), thereby downplaying the characteristics of the event. The PTS literature suggests that interpersonal, frequent and childhood events are related to more distress (Santiago et al., 2013; Suliman et al., 2009), although this had not been systematically extended to PTG until now. Interestingly, the correlations in Study 1 (Table 4), Study 3 (Appendix XII) and Study 4 (Table 16) suggested that event characteristics were more strongly related to distress rather than growth. This overall finding is consistent with other literature (Lowe et al., 2013), and it may be that the dose-response relationship is more pronounced with PTS than PTG, which warrants further investigation (see section 10.4.).

That is not to say that event characteristics are completely irrelevant to growth. Study 1b and Study 4 were the first to reveal that event characteristics can provide the context in which the same coping strategies can have *both* adaptive and maladaptive functions in promoting PTG. The findings question the prevailing view in the wider trauma literature that coping strategies are *either* 'adaptive' or 'maladaptive' (Folkman & Moskowitz, 2004). Some recent literature has viewed this dichotomy as a "fallacy of uniform efficacy" (Bonanno & Burton, 2013, p. 591), where the effectiveness of coping strategies is actually thought to vary over time, rather than remain static. This has direct relevance to PTG development because coping and cognitive processes implicated in subsequent adjustment are likely influenced by the nature, duration and controllability of the event (Carver & Connor-Smith, 2010). For example, as studies 1, 2 and 4 have shown, avoidance may be helpful to PTG in the short-term as a means to prevent being overwhelmed by events, but it could hinder growth in the long-term as it may represent

a failure to process the effects of the events (Zoellner & Maercker, 2006). This thesis therefore draws greater attention to the role that event characteristics can play in determining the effectiveness of coping strategies that may be ultimately responsible for PTG.

The thesis findings indicate that event characteristics may indirectly relate to PTG outcomes as a function of individual differences in responses to adverse events. Extant literature has suggested that differences in coping strategies used, for example, can play a role in determining PTS reactions (Bonanno & Burton, 2013; Hagenaars et al., 2011), dependent upon the nature of the event experienced. This finding was best reflected within the qualitative studies 2 and 4b, which both revealed the processes whereby people either succumbed to, or were motivated by, their multiple adverse experiences. The CGAS model in Study 3 also uniquely identified cognitive pathways between centrality, rumination and control perceptions to explain growth, while event characteristics did not contribute towards the final model. By uncovering some of the mechanisms whereby people report PTG following cumulative events, the thesis can partially explain mixed findings that have plagued current literature in respect of associations between event characteristics and PTG (Kira et al., 2013; Kılıç et al., 2016; Shakespeare-Finch & Armstrong, 2010). Thus, while the characteristics of the adverse event itself do not necessarily lead to PTG, they could interact with individual differences to produce different levels of growth.

The thesis has also advanced knowledge in respect of PTG processes and outcomes in those who experience multiple and wide-ranging events. Existing knowledge of positive change is largely based on studies using a group of people exposed to a specific type of adverse event, rather than the range of events that some people can face in the lifetime (Seery et al., 2010). In general, the findings observed throughout this thesis among survivors of multiple adverse events were broadly similar to studies of individuals that focus on the same types of event. For example, studies 1 and 2 found that increased social support and active forms of coping were related to

more PTG and beneficial to the growth process, consistent with research that does not account for adverse event history (Prati & Pietrantoni, 2009). In addition, while avoidant coping over the short-term was beneficial, as revealed in Study 2, it may indicate a failure to process distress as per the findings of Study 4b. It would therefore seem that despite literature that documents heightened negative reactions to frequent, deliberately perpetrated or childhood events (Graham-Kevan et al., 2015; Santiago et al., 2013; Shakespeare-Finch & Armstrong, 2010), the potential for PTG remains, regardless of adverse exposure. In addition, this also means the findings suggest that the FDM and ACPM may also explain some processes relevant to growth in those with multiple exposures. It is encouraging that growth can still be experienced by people regardless of their adverse life trajectory or background, thus revealing a resilient quality to PTG that permeates across situations and various life circumstances. Therefore, this thesis has made important contributions in developing an understanding of the role of event characteristics in the growth process.

10.3.3. The relationship between posttraumatic stress and growth may be curvilinear

The thesis contributed to the current debate in the literature (Hall et al., 2015; Shakespeare-Finch & Lurie-Beck, 2014; see Chapter 2, section 2.7.2.) as to the nature of the relationship between PTG and PTS. While the findings could not fully determine whether distress preceded growth, or vice versa, it was increasingly clear as the thesis progressed that both concepts were intertwined in the processing of adverse events. People's qualitative reports of growth in studies 2 and 4b were rarely accompanied without simultaneous experiences of distress. Meanwhile, Study 3 identified shared and unique pathways towards PTG and PTS using a previously untested combination of cognitive factors. While it may be seductive to think that growth is a solely positive experience, the thesis offers support to the idea that growth and distress co-exist, as argued in recent studies (Blix et al., 2013; Lowe et al., 2013; Shakespeare-Finch & Lurie-Beck, 2014), rather than being at opposite ends of a continuum (Chen et al., 2015;

Frazier et al., 2001). Moreover, the findings offer empirical support to the ACPM and FDM (Joseph et al., 2012; Tedeschi & Calhoun, 2004), in that some degree of distress is a necessary part of the PTG processes. It may be that the more value that is placed on life (PTG), the more potential there is for loss and distress (Park, 2010). Thus, the potential for growth should be considered alongside, rather than separate to, distress.

While the broad finding was that distress and growth co-exist, this was not always quantitatively consistent across the thesis. For example, studies 1, 2, 3 and 4a reported both positive and an absence of cross-sectional and longitudinal associations between PTS and PTG. This may be because the latter studies in this thesis focused on the intrusive processing aspect, rather than the entire PTSD cluster of symptoms as a whole in Study 1a (see Chapter 7, section 7.3. for discussion). Intrusive thoughts may be functional in nature, and thus, the overall findings offer support to existing models (Joseph et al., 2012; Tedeschi & Calhoun, 2004), where they serve as a necessary trigger of PTG. In contrast, the avoidant and hyperarousal aspects of PTS are more distinct, in that they may represent illusory aspects of growth (Lowe et al., 2013; see section 10.3.4.). It may be of use to differentiate between different aspects of PTS in order to explain associations with PTG.

While the thesis found some evidence that greater intrusive symptoms promote growth within Study 1, this argument does not fully account for the results observed in the longitudinal and qualitative studies in this thesis. Study 4b found that people reported high distress and minimal PTG in the *depressed PTG* trajectory, which was contextualised in Study 2 interviews with survivors who described their negative thoughts and feelings as a barrier to their growth. The thesis findings also provide support to the curvilinear (inverted-'U') relationships hypothesised in the literature (Kleim & Ehlers, 2009; Shakespeare-Finch & Lurie-Beck, 2014), best observed in Study 4a, such that PTG may not be triggered in circumstances where there is too little distress to prompt growth. Alternatively, the potential for growth may be overwhelmed in situations with too much subjective distress. While it is difficult to quantify due to variations among

individuals, there may be an ‘optimal’ point beyond which people can be overwhelmed by stress to the extent that it prevents any PTG.

At the same time, the prospect of curvilinear relationships does not suggest that there is an optimal point where PTS symptoms are related to PTG; rather, this gives rise to the possibility that the relationship between PTS and PTG is bidirectional. Existing literature largely relies on cross-sectional data (e.g. Bensimon, 2012) or prospective designs (e.g. Dekel et al., 2012) that only make it possible to conclusively test one of the possible causal relations between the two concepts. However, Study 4b uniquely revealed a variety of relationships between PTS and PTG among people as they continued to experience events during the study period, which were difficult to tease apart in the quantitative studies in this thesis. Similarly, Study 3 mapped overlapping and separate cognitive pathways between PTG and PTS using advanced statistical methods, which suggests that these concepts are both related, yet distinct outcomes following adversity. It may be that PTG could be both a precursor to, and by-product of, PTS symptoms as part of attempts to comprehend events. The difficulty in separating the two concepts may imply that some distress is needed to provide an impetus to grow, while at the same time, continued cognitive engagement with the adverse event is distressing (Blix et al., 2016). Therefore, the mixed-method findings in this thesis for the first time provided greater insight into the complex relationship between PTG and PTS beyond any existing literature.

10.3.4. Posttraumatic growth is both a coping process and an outcome

Another important question addressed by this thesis concerned the function and nature of PTG. There has been some disagreement in the existing literature as to whether growth is a self-enhancing coping strategy (Cheng, Wong, & Tsang, 2006; Frazier et al., 2009; Hobfoll et al., 2007) or reflects actual improvements in well-being (Joseph & Linley, 2005; Tedeschi & Calhoun, 2004). The findings of the thesis tend to support the idea that PTG can serve *both* self-enhancing and functional qualities, as

outlined in the JFM (Maercker & Zoellner, 2004; Zoellner & Maercker, 2006), and thus it is both a coping process and an outcome of the struggle with adverse events.

Some of the data gathered in the earlier studies of this thesis would lend support to the view that PTG is associated with transformative personality changes, and improvements in well-being (Tedeschi & Calhoun, 2004). Study 1 generally found that growth was associated with less avoidance coping and more problem-focused strategies. Study 2 included participants who demonstrated growth through newly found altruistic behaviours and corroboration from close others, while Study 3 showed that deliberate rumination was positively correlated with PTG. Collectively, these findings illustrate the constructive side of PTG as advocated by the FDM, ACPM and JFM, which argue that increased pro-social behaviour (Staub & Vollhardt, 2008), use of problem-focused coping (Helgeson et al., 2006), and intentional thoughts regarding the event (Stockton et al., 2011; Taku et al., 2009) illustrate higher levels of functioning that arise following emotional struggles with adverse events.

At the same time, this thesis also appeared to reveal the illusory aspect of PTG in more detail, which is an issue not addressed within the FDM and ACPM. In studies 2 and 4b, people's reports of enhanced growth were sometimes matched by negative behavioural changes, a lack of cognitive attempts to understand the event, and an inability to manage distress. According to some arguments (Hobfoll et al., 2007), cognitive engagement with the stressor and positive behavioural changes are essential to verify the quality of perceived PTG. These discrepancies suggest that some people's reports of growth are not consistent, and may not reflect *real* PTG as advocated by a significant proportion of the literature which tends to take growth reports at face value (e.g. Tedeschi & Calhoun, 2004). This is *not* to deny people's experiences of positive change; rather, it may be necessary to understand growth as a subjective perception, and draw distinctions between *perceived* and *actual* growth (Frazier et al., 2009) which have different relations with subsequent adjustment. Until now, the JFM has not received systematic empirical attention in the literature. However, this thesis provided evidence to

support the JFM and extended criteria for identifying reports of illusory and constructive growth (Zoellner & Maercker, 2006), thus revealing the multidimensional nature of PTG.

10.3.5. Growth is variable over time and may represent an individual difference trait

This thesis provided a greater understanding of the temporal nature of PTG by contributing to the limited longitudinal literature on the topic. The current thesis challenges the theoretical assumption that PTG is stable over time (Danhauer et al., 2013; Frazier et al., 2001; Tedeschi & Calhoun, 2004), because it assumes that people who experience adverse events would react similarly. Indeed, Study 4 separately demonstrated quadratic and other non-linear PTG trajectories over time that were influenced by multiple event-related and psychosocial factors, also endorsed within Study 2 interviews. The nature of growth over time appears far more complex than current literature acknowledges, as it does not often screen for multiple types of events or control for subsequent exposures to events. Existing studies in both the PTG and PTSD literature limit adjustment to binary "no PTG/PTSD" or "PTG/PTSD" outcomes (Tsai, El-Gabalawy, Seldge, Southwick, & Pietrzak, 2015) or provide no comparative qualitative data. Such an approach does not serve the need to understand more nuanced PTG reactions to adverse events, as this thesis demonstrates. This flexible interpretation of growth over time is also resonates with recent shifts in the PTSD literature towards interpretations of psychological adjustment that reflect more heterogeneity in the way people respond to life challenges (Bonanno & Mancini, 2012; Fink et al., 2017).

While long-term individual differences in PTG have emerged in recent research (e.g. Tsai et al., 2016), the wider implications have not yet been fully recognised. In fact, the thesis findings endorse the long-held view that people cope with significant life events very differently (Bonanno & Mancini, 2012). Conceptually, this would fit with arguments (Hobfoll, 2002; Hopson, 1982; Jayawickreme & Blackie, 2014) that PTG may reflect the ways in which people interpret life transitions and challenges more generally. Indeed, a

consistent theme across all studies in this thesis was lack of any direct relationship between event characteristics and PTG (see section 10.3.2.) which supports the idea that subjective responses to adversity are critical to subsequent psychological adaptation. Thus, while the growth process is highly susceptible to individual differences over time, PTG itself could equally be viewed as an individual difference trait in that some people are more predisposed to experience growth compared to others (Tedeschi & Calhoun, 2004). An advantage of applying this developmental individual difference approach to the study of PTG is that it recognises that people are open to positive and negative change throughout their lives (Aldwin et al., 1996; Eve & Kangas, 2015; Roberts & Mroczek, 2008) and is not biased in its focus towards either positive *or* negative change. Thus, growth may be better understood within a developmental framework that takes into account individual differences.

10.4. Clinical implications

The findings can inform clinical efforts to raise awareness of PTG. The empirical chapters revealed that the experience of positive change does not necessarily equate to an absence of negative symptoms, and vice versa. Therefore, practitioners should be mindful that growth and distress can co-exist, and psychological assessments and efforts that address both aspects of human experience would provide more holistic support following adverse events. This is all the more important given that research generally finds that existing interventions, such as cognitive behavioural therapy, are effective in reducing distress, but not necessarily in promoting PTG (Zoellner, Rabe, Karl, & Maercker, 2011). Clinicians should not only focus on areas of life negatively impacted by the adverse event, but also those which the client feels have changed for the better. At the same time, this thesis does not suggest that PTG should be the necessary or desired outcome for support interventions, or that it should be used to gauge the 'success' of support. Indeed, encouraging people to experience PTG may set up unrealistic expectations that people *should* grow following adverse events, thereby leading to more distress (Joseph & Linley, 2006). However, opportunities to learn from survivors who

perceive PTG may provide a more balanced assessment of psychological adjustment post-adversity. Thus, both professionals and others should be mindful about the language that is used towards survivors, in that it should be supportive and guided by the client, rather than being dictated by a *need* to report growth.

Throughout the thesis, recommendations were made in respect of potential cognitive and psychosocial factors that could be the focus of intervention efforts to encourage growth. This could serve as a useful starting point for practitioners who are keen to support survivors in their PTG experiences as they navigate significant life challenges. Importantly, as all studies in this thesis found that PTG could occur regardless of event characteristics, it is likely that interventions or support for survivors should be based on the subjective impact of the event to be beneficial, rather than by the nature of the adversity experienced. That said, the literature on the clinical benefits of PTG is still new and evolving, with only vague guidance existing at present (Calhoun & Tedeschi, 2014; Joseph & Linley, 2006). Thus, more specific recommendations for practitioners are limited at this time, pending further empirical enquiry. However, the clinical impact of the findings should not be restricted to a therapeutic setting; rather, evidence from studies 1 and 2 suggest that growth can occur through supportive social connections within the survivor's network outside of professional intervention. It would seem that support which meets an individual's basic needs for autonomy, competence and relatedness is likely to be conducive to PTG (Joseph et al., 2012; Yeung et al., 2016).

While at face value it seems fruitful to promote PTG, the findings of this thesis do suggest that not all reports of growth are correlated with positive improvements in psychological well-being. In some cases, it may be that survivors are not externalising negative symptoms yet are still experiencing great distress. This was best shown in Study 4b, whereby those with the highest growth (*struggling PTG*) demonstrated some severe negative changes, such as threats of suicide. While more PTG has been traditionally regarded as an index of improved well-being in the literature (Roepke, 2015), it could actually represent a risk marker for high distress. Thus, the adaptive quality of

PTG in clinical settings could be questioned until more is known about the different functions it may serve for people, including what lesser and greater levels of PTG actually represent in terms of psychological functioning.

At the same time, the very fact that positive changes can be reported after adverse events – as this thesis and existing research has shown (Tedeschi & Calhoun, 1995) – means it is important for clinicians not to deny or minimise accounts of growth. Notably, while the FDM, ACPM and JFM theories emphasise the importance of maintaining a concerted focus on processing the adverse event (Joseph et al., 2012; Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006), the current findings also suggest that in some cases, it may be beneficial for individuals to engage in distraction and remain optimistic to enhance self-esteem and personal efficacy. Indeed, literature recognises that many people engage in illusory and distorted thoughts that do not necessarily reflect the reality around them on a day-to-day basis as well as in response to life-changing events (Nadelhoffer & Matveeva, 2009; Taylor & Brown, 1988). However, if PTG *is* real, clinicians and individuals close to the survivor may be able to observe PTG 'in action' through the establishment of purposeful goals, prioritising of new activities and the development of meaningful relationships. Therefore, clinicians should be cautious about equating PTG with positive improvements in well-being unless there are tangible changes in life domains, but at the same time, avoid minimising people's experiences of positive change.

10.5. Strengths and limitations of the thesis

The thesis has additional strengths and weaknesses outside of those already identified within the empirical chapters. One limitation of the thesis was the exclusion of control groups, which are sparse in the PTG literature. The use of a control group of participants with no adversarial exposure would better able to establish the veracity of growth reports. However, unlike existing research (e.g. Poorman, 2002), all empirical studies in this thesis included people who reported minimal or no growth. This is

advantageous as the sampling method is not positively biased towards those only reporting PTG, thus overcoming concerns that growth reports are exaggerated (Smith & Cook, 2004). However, several authors have criticised PTG measures, such as the PTGI used in this thesis, as focusing on only positive changes (Blackie et al., 2017; Joseph et al., 1993), which could mean that the current thesis was limited in its ability to record negative changes. Yet, the empirical chapters also assessed some negative changes through the PTSD-8 measure and qualitative interviews, thus providing a more holistic investigation into people's experiences of PTG.

The thesis was informed by a critical realist epistemological stance (see Chapter 4, section 4.4.). This approach broadly argues that we only have subjective interpretations of the world as true knowledge cannot be observed directly (Bhaskar, 1998; Fletcher, 2017), and so steps were taken throughout this thesis to enhance the reliability and validity of the findings. For instance, Guba's (1981) reliability criteria was used and interrater reliability calculated in Study 2 (see section 6.3.3.2.), and reliability and validity tests conducted for the CGAS model in Study 3 (section 8.5.3.). Enhancing the methodological rigour of the findings by demonstrating an awareness of reliability and validity issues allows the researcher to speculate on possible PTG causal mechanisms and relationships with greater confidence.

A further limitation relates to the wording of the PDS questionnaire. The questionnaire invites people to respond to events that they, or someone close to them, have experienced. Literature has indicated that while people can be adversely affected by events experienced directly themselves or indirectly through close others, the risk of developing symptoms is less if the event is experienced through indirect means (May & Wisco, 2016). Thus, it is possible that some people may have responded in relation to events that were directly experienced, while others may have completed the checklist in relation to events that were experienced by a person close to them, which may have potentially underestimated the symptom scores on other measures. However, all interview participants in Study 2 and 4b reported events that were directly experienced,

and the wording of all other questionnaires invited participants to record their symptoms in relation to their *own* experiences of adversity.

Another caveat to the thesis is that not all factors relevant to growth were studied. One such group of factors include demographic variables. For example, a large number of studies have already attempted to ascertain the impact of gender (Vishnevsky, Cann, Calhoun, Tedeschi, & Demakis, 2010), age (Boyle, Stanton, Ganz, & Bower, 2017), and ethnicity (Helgeson et al., 2006), on perceived PTG. While not the primary focus of this thesis, the empirical studies did control for the impact of age, gender and ethnicity where possible. In Study 4a, analysis was run with and without demographic controls, although similar results were obtained; preliminary analyses were also conducted to assess for any differences in PTG among demographic variables in studies 1, 2 and 3, although none were found. Furthermore, the overwhelming majority of participants throughout this thesis were White females from early to mid-adulthood, which would have precluded meaningful analysis of any differences in PTG as a function of demographic factors. This high ratio of female to male participants and White ethnicity is not unique to this thesis, and is a common phenomenon in PTG research generally (Kent et al., 2013; Vishnevsky et al., 2010).

Finally, the thesis did not assess or explore the impact of various event characteristics and psychosocial factors on the five dimensions of PTG (see Chapter 2, section 2.4., for description). When considering the subscales of the PTGI measure developed by Tedeschi and Calhoun (1996), studies have found that psychosocial factors are differentially related to the five domains of growth (Frazier et al., 2009; Karanci et al., 2012; Zoellner et al., 2011), revealing differences and additional lines of enquiry that may be hidden if overall PTG scores are considered alone. However, this assumes there are indeed five dimensions of PTG, whose underlying factor structure has been reported as unstable in a number of studies (Osei-Bonsu, Weaver, Eisen, & Vander Wal, 2012; Sheikh & Marotta, 2005), and in this thesis where the spiritual element

was less apparent in the samples. Thus, while the multidimensional nature of PTG is still to be debated, it was felt best to retain the overall global score on the PTGI measure.

10.6. Directions for future research

The findings in relation to the five research questions in this thesis have the potential to inform future research efforts. The empirical chapters identified a range of new cognitive, psychological and social factors that are indirectly or directly related to PTG, which should be extended in subsequent studies. This includes aspects of the social environmental context (e.g. reactions to disclosure and elements of therapy identified in Study 2) and identity aspects (Study 3) which are poorly defined by the existing ACPM and FDM models, and could further reveal the conditions which promote or harm PTG development. For example, some participants disclosed that they were accessing therapy at the time they were interviewed for Study 2, and it was therefore possible that this may have had an impact on the level of PTG experienced. Research into the potential for different psychological interventions to enhance growth is in its infancy (Roepke, 2015), and thus further studies are needed. Second, investigations should seek to consolidate knowledge of risk and protective factors for PTG into a unified framework. Emerging PTG research that conceptualises factors in this way (e.g. Mohr & Rosén, 2017) could help identify clinically useful risk and protective factors involved in the PTG process, such as threats of suicide as noted in section 10.4. Together, these suggestions could aid the revision of the FDM and ACPM models which have not been updated for several years.

While all studies demonstrated that many people can experience PTG regardless of experiencing interpersonal events, multiple event types and adversity across the lifespan, the exact mechanisms whereby cumulative exposure can facilitate or inhibit PTG are still largely unknown. One potential avenue is to explore other ways of categorising adverse events outside of those in this thesis. Taxonomies of adverse events have been proposed (Kira et al., 2008, 2013) that include attachment events (e.g.

parental abandonment), 'shared' events experienced by many people at once (e.g. genocide), and distinctions between isolated (e.g. car accident) and continuous events (e.g. discrimination), as well as the accumulative effects of different types of adversity. To assess whether the pattern of relationships found in this study hold across other samples and categorisations of events, future studies should continue to explore the differential effects of the type and frequency of adverse events on PTG.

The thesis raises important questions about the relationship between PTG and PTS. While it appears that PTG and PTS are positively related, the thesis did not explore whether this relationship changes as function of other variables. Recent studies suggest that age (Palgi, 2016), lower income and social support (Wu, Xu, & Sui, 2016), and having a diagnosis of PTSD (Schubert, Schmidt, & Rosner, 2016) moderate the relationship between growth and distress. Examining other potential moderators of the PTG-PTS relationship may explain some of the inconsistent findings reported in the wider literature (Chen et al., 2015; Kashdan & Kane, 2011; Lowe et al., 2013), and further inform the development of the ACPM and the CGAS model developed in Study 3. In turn, this would provide greater insight as to the context in which PTG leads to more distress, or vice versa.

While this thesis made an important contribution to understanding illusory and constructive PTG, more investigations are needed to understand the other possible functions that growth can serve. The thesis considered self-enhancement explanations for PTG (Affleck & Tennen, 1996; Taylor, 1983), although growth has also been construed as an active coping strategy (Tennen & Affleck, 2002), a defensive mechanism against perceived threats (Boerner et al., 2017), a general attitude towards overcoming adversity (Blackie et al., 2017), increasing maturity that comes with age (Roberts & Mroczek, 2008) or merely an expectation bias that people 'should' grow (Splevins et al., 2010). Future studies should therefore seek to corroborate scores on PTG measures with other ways of measuring growth-type traits advocated by growth theorists (see Chapter 2, section 2.4.). There is a clear need for more mixed-method research in this

regard to identify aspects of growth that may be real or illusory. For example, diary studies that collect qualitative information and invite participants to respond to questionnaires could establish how positive changes manifest as behaviour, such as transformations in life philosophy or demonstrating altruistic tendencies towards others. This approach would go some way to address concerns that *perceived* PTG is not the same as *actual* PTG (Frazier et al., 2009). A more holistic approach would be better able to capture the extent to which thoughts, feelings and behaviours reflect illusory or constructive forms of PTG.

Finally, while this thesis provided greater insight as to the changeable nature of PTG over time, there is a need to explore other factors related to growth across a diverse range of events. Recent longitudinal studies have indicated that perceived threat (Danhauer et al., 2015), world assumptions (Valdez & Lilly, 2015) and attributional styles (Ho, Chan, Yau, & Yeung, 2011) may influence the course of PTG over time, although these are primarily based in samples experiencing health-related adversity. Therefore, more longitudinal investigations are needed across a wider range of samples. Furthermore, and unlike this thesis, many existing studies (e.g. Blix et al., 2016; Dekel et al., 2012) take measurements at lengthy time spans (e.g. one to 17 years apart) which make it difficult to assess the immediate psychological precursors and consequences of any PTG experiences associated with adverse events. Such methodological issues can make it difficult to clearly identify how various psychosocial variables can make PTG more or less likely. Therefore, collecting data on a wider range of psychosocial variables at frequent intervals could better help to map and understand longitudinal growth trajectories.

10.7. Thesis conclusion

This starting point of this thesis was to identify the psychological processes whereby people can report highly meaningful positive changes after adverse events. It began by investigating the characteristics of the triggering events themselves, before

moving on to explore the complex processing that occurs in the days, months and years after the adverse event. Adopting a flexible and robust methodological approach, this thesis has provided considerable empirical and theoretical scrutiny as to the nature, processes and outcomes of growth. The thesis has addressed current gaps and debates in the PTG literature in terms of the associations between event characteristics and PTG, and mixed relationships between distress and growth. It has also considered debates around the validity and veracity of PTG experiences, and the extent to which growth can change and progress over time. Examining these issues has therefore enabled a more holistic and thorough understanding of the concept of PTG, and generated new questions for empirical study in the future.

The main conclusions of this thesis are that existing theories need to better reflect the latest empirical work by extending the range of factors under investigation to provide more insight into the psychological and environmental conditions which promote more (or less) PTG over time. There is also a need to further understand the nature of PTG itself, in respect of how it relates to PTS through third variables, and the different illusory and constructive functions it may serve for survivors of multiple types of adverse events. Finally, more longitudinal, prospective and mixed-method studies of PTG are needed to assess the behavioural, environmental, psychological and social factors that contribute towards changes in growth over time. While the immediate clinical benefits of PTG are appealing, more research is needed to address issues of validity and measurement for these to be realised, so that the growth literature can become firmly established.

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APPENDICES

Appendix I – Study 1 recruitment poster

University of Central Lancashire

How do you cope with stressful events? Do you find them difficult to deal with or do you cope with them well?

Have previous traumatic events made you 'stronger' as a person?

While we know traumatic events can be distressing, some people appear to triumph in the face of adversity and become more resilient as a result. This study will aim to explore what factors may help people to become stronger.

If you would like to take part, you will be asked to complete a questionnaire about your experiences of traumatic events, relationships, coping style, religion/spirituality and social support.

You can complete the questionnaire online and it will take about 20-30 minutes of your time. For your participation, you will be entered into a prize draw to win a £50 shopping voucher.

If you would like to complete the questionnaire on paper, or have any other questions, please contact Matt Brooks. The online link to the questionnaire is provided below.

Matt Brooks
PhD Researcher
mbrooks1@uclan.ac.uk

Dr. Michelle Lowe
Supervisor
mlowe2@uclan.ac.uk

Positive effects of trauma study www.esurveycreator.com/s/dfa611b mbrooks1@uclan.ac.uk

Appendix II – Study 1 ethics approval

20 June 2014

Michelle Lowe / Matthew Brooks
School of Psychology
University of Central Lancashire

Dear Michelle / Matt

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC 143_1st Stage**

The PSYSOC ethics committee has granted approval of your proposal application '**An investigation of post-traumatic growth in forensic and non-forensic populations**'. Approval is granted up to the end of project date* or for 5 years from the date of this letter, whichever is the longer. It is your responsibility to ensure that:

- the project is carried out in line with the information provided in the forms you have submitted
- you regularly re-consider the ethical issues that may be raised in generating and analysing your data
- any proposed amendments/changes to the project are raised with, and approved, by Committee
- you notify roffice@uclan.ac.uk if the end date changes or the project does not start
- serious adverse events that occur from the project are reported to Committee
- a closure report is submitted to complete the ethics governance procedures

(Existing paperwork can be used for this purposes e.g. funder's end of grant report; abstract for student award or NRES final report. If none of these are available use e-Ethics Closure Report Proforma).

Yours sincerely

C Sullivan

Cath Sullivan
Chair
PSYSOC Ethics Committee

* for research degree students this will be the final lapse date

NB - Ethical approval is contingent on any health and safety checklists having been completed, and necessary approvals as a result of gained.

Participant Information Sheet

What is the study about?

This project is being conducted by Matthew Brooks (PhD student) from the University of Central Lancashire under the supervision of Dr Michelle Lowe. We are interested in how people deal with stressful events. While these events are upsetting for people to experience, some people appear to become "stronger" as a result. This study will explore how our past and present circumstances may help us to respond in a positive way, in various samples including victims and perpetrators of crime, students and health/support workers where research is currently limited.

What do I have to do?

If you agree to take part, you will be asked to complete a questionnaire about your experiences of traumatic events, relationships, coping style, religion/spirituality and social support. The questionnaire will take around 20-30 minutes of your time and can be completed in-person or online.

Some of the questions may be sensitive in nature and it is fine for you to not respond to a question if it makes you feel uncomfortable in any way. You will also be invited to provide some personal information, such as your age, gender, ethnicity, sexuality, religious beliefs and occupation.

Do I have to take part? How will taking part in this study benefit me?

Your participation in this study is voluntary and you are under no obligation to continue. You can withdraw your responses at any time until you return your questionnaire to the researcher or submit it online. Your responses will be confidential, however if you disclose any information that suggests you may harm yourself or others, the researcher will have to share that information with the appropriate support/legal organisations, such as the Police. For your participation, you will be entered into a prize draw to win a £50 shopping voucher.

In the long-term, your responses could help identify the reasons why people may or may not become more resilient following stressful experiences. In addition, it is hoped that they will help improve the way in which people might seek help from services or develop strategies to help them adjust more positively following an upsetting situation.

What will happen to my responses?

The responses you provide will be saved on a password-protected statistical database, and any questionnaires will be stored in a lockable filing cabinet. Your completed questionnaire will not be seen beyond the researcher and his supervisory team. The overall findings from this study may be published in a scientific journal and will be seen by the general public, but there is no way in which the responses you provide will be attributed to you personally.

There will be a follow-up study and I would also like people to be contacted about this in the future. You will be invited to leave your contact details if you wish to participate in that study. If

you provide contact details, these will be kept securely and separately from your responses on this questionnaire.

Further information

If you have any further questions about the study, please feel free to contact myself or my supervisors using the contact details provided at the end of the set of questionnaires.

Consent Form

To be completed by researcher:

Participant number: _____

Please indicate that you understand the nature of your participation by reading the information below. *(Please tick)*

- ☐ I have read the participant information sheet that has been given to me prior to completing this questionnaire, and fully understand the purpose of the study.
- ☐ I understand that my responses in this questionnaire will be only be shared between the research team at the University of Central Lancashire.
- ☐ **I am aware that if I disclose anything that suggests that I may seriously harm myself or others, the researcher will have to share that information with an appropriate person.**
- ☐ I understand that overall results from this study will be written up and shared in publications, but that I can never be personally identified from them.
- ☐ I understand that I can stop completing the questionnaire at any time today, even after I have signed this form, but that once I return my questionnaire and leave today, my answers cannot be removed from the study.
- ☐ I have read all of the above, and I am happy to continue with the interview.

Participant signature: _____ Date: _____

About You

Please complete the following information about yourself.

What is your gender? *Please circle.* **MALE** **FEMALE**

Please state your age. _____

What is your ethnicity? *Please tick.*

1.	White – British		9.	Asian – Bangladeshi	
2.	White – Irish		10.	Asian – Indian	
3.	White – Other		11.	Asian – Pakistani	
4.	Black – African		12.	Asian – Other	
5.	Black – Caribbean		13.	Mixed – White & Black African	
6.	Black – Other		14.	Mixed – White & Asian	
7.	Chinese		15.	Mixed – White & Black Caribbean	
8.	Other		16.	Mixed – Other	

What is your marital status? *Please tick.*

1.	Single		5.	Separated	
2.	Dating		6.	Divorced	
3.	Cohabiting (living with partner but not married)		7.	Widowed	
4.	Married				

What is your sexual orientation? *Please tick.*

1.	Straight		4.	Bisexual	
2.	Gay		5.	Other	
3.	Lesbian				

What is your religion? *Please tick.*

1.	Buddhist		6.	Muslim	
2.	Christian		7.	Sikh	
3.	Hindu		8.	Atheist (no religion)	
4.	Humanist		9.	Other	
5.	Jewish				

Do you consider yourself to have a disability? *Please circle.* **YES** **NO**

Previous Experiences

Sometimes people experience or are witness to single, multiple or repeated events that may cause them physical and emotional distress, injury or threats to their life and the lives of others.

Have you or someone close to you ever experienced a situation or event that involved physical or emotional distress, injury or threats to your life or the lives of others? *Please circle.*

YES **NO**

Continue to next page

If yes, please indicate what type(s) of event(s) you are referring to by indicating how many times the incident occurred, to the best of your memory. If you are not sure how many times, place a tick ☑ in the appropriate box.

		How many times?
1.	Accident (e.g. car, train, industrial)	
2.	Natural disaster (e.g. fire, hurricane, tornado, earthquake)	
3.	Serious attack or threat(s) by partner	
4.	Serious attack or threat(s) by other(s)	
5.	Sexual abuse	
6.	Rape by partner	
7.	Rape by other(s)	
8.	Imprisonment or hostage	
9.	Terrorism, conflict, political violence or war zone	
10.	Serious or terminal illness, medical negligence	
11.	Unexpected death or separation of/from family member or close friend	
12.	Parental neglect or abuse	
13.	Directly witnessing any of these events happen to someone	
14.	Exposure to any of these events through work that has resulted in stress	
15.	Any other serious event(s) or situation(s) - please specify below:	

Which was the worst or most serious event? *Please state number of item.* _____

How old were you when this event first occurred? *Please state age.* _____

Beliefs and Values Scale (BVS; King et al., 2006)

Some people may hold religious or spiritual beliefs that help them to cope with stressful situations. Please read the following statements listed below and for each statement please indicate to what extent each of the following is true for you in the past two weeks.

You may replace the term 'God' with the higher power in your spiritual or religious faith or belief, such as the divine, a higher power, supreme being, nature, spirit etc.

Please use the following scale to score your responses.

0	**1**	**2**	**3**	**4**
Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

1.	I am a spiritual person.	0	1	2	3	4
2.	I believe I have a spirit or soul that can survive my death.	0	1	2	3	4
3.	I believe in a personal God.	0	1	2	3	4
4.	I believe meditation has value.	0	1	2	3	4
5.	I believe God is everywhere.	0	1	2	3	4
6.	I believe what happens after I die is determined how I have lived my life. (E.g. If you are a good person, you will go to a good place)	0	1	2	3	4
7.	I believe there are forces for evil in the Universe.	0	1	2	3	4
8.	Although I cannot always understand, I believe everything happens for a reason.	0	1	2	3	4
9.	I believe human physical contact can be a spiritual experience.	0	1	2	3	4
10.	I feel most at one with the world when surrounded by nature.	0	1	2	3	4
11.	I believe in life after death.	0	1	2	3	4
12.	I am a religious person.	0	1	2	3	4
13.	Religious ceremonies are important to me.	0	1	2	3	4
14.	I believe life is planned out for me.	0	1	2	3	4
15.	I believe God is a life force.	0	1	2	3	4
16.	At least once in my life, I have had an intense spiritual experience.	0	1	2	3	4
17.	I believe that there is a heaven.	0	1	2	3	4
18.	I believe the human spirit is immortal.	0	1	2	3	4
19.	I believe prayer has value.	0	1	2	3	4
20.	I believe there is a God.	0	1	2	3	4

Brief COPE (Carver, 1997)

These items deal with ways in which you cope with stress and problems generally. Each item says something about a particular way of coping. Try to rate each item separately in your mind from the others, using the scale below. Make your answers as true FOR YOU as you can, in the past two weeks.

0	**1**	**2**	**3**
I haven't been doing this at all	I've been doing this a little bit	I've been doing this a medium amount	I've been doing this a lot

1.	I've been turning to work or other activities to take my mind off things.	0	1	2	3
2.	I've been concentrating my efforts on doing something about the situation I'm in.	0	1	2	3
3.	I've been saying to myself "this isn't real".	0	1	2	3
4.	I've been using alcohol or other drugs to make myself feel better.	0	1	2	3
5.	I've been getting emotional support from others.	0	1	2	3
6.	I've been giving up trying to deal with it.	0	1	2	3
7.	I've been taking action to try to make the situation better.	0	1	2	3
8.	I've been refusing to believe that it has happened.	0	1	2	3
9.	I've been saying things to let my unpleasant feelings escape.	0	1	2	3
10.	I've been getting help and advice from other people.	0	1	2	3
11.	I've been using alcohol or other drugs to help me get through it.	0	1	2	3
12.	I've been trying to see it in a different light, to make it seem more positive.	0	1	2	3
13.	I've been criticising myself.	0	1	2	3
14.	I've been trying to come up with a strategy about what to do.	0	1	2	3
15.	I've been getting comfort and understanding from someone.	0	1	2	3
16.	I've been giving up the attempt to cope.	0	1	2	3
17.	I've been looking for something good in what is happening.	0	1	2	3
18.	I've been making jokes about it.	0	1	2	3
19.	I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	0	1	2	3
20.	I've been accepting the reality of the fact that it has happened.	0	1	2	3
21.	I've been expressing my negative feelings.	0	1	2	3
22.	I've been trying to find comfort in my religion or spiritual beliefs.	0	1	2	3
23.	I've been trying to get advice or help from other people about what to do.	0	1	2	3
24.	I've been learning to live with it.	0	1	2	3
25.	I've been thinking hard about what steps to take.	0	1	2	3
26.	I've been blaming myself for things that happened.	0	1	2	3
27.	I've been praying or meditating.	0	1	2	3
28.	I've been making fun of the situation.	0	1	2	3

PTSD-8 (Hansen, Anderson, Armour, Elklit, Palic & Mackrill, 2010)

The following are symptoms that people sometimes have after experiencing, witnessing or being confronted with a traumatic event.

Please read each one carefully and mark your answer according to how much the symptoms have bothered you since the trauma in the past two weeks, using the scale below.

0	**1**	**2**	**3**
Not at all	Rarely	Sometimes	Most of the time

1.	Repeated thoughts or memories of the event.	0	1	2	3
2.	Feelings as though the event is happening again.	0	1	2	3
3.	Repeated nightmares about the event.	0	1	2	3
4.	Sudden emotional or physical reactions when reminded of the event.	0	1	2	3
5.	Avoiding activities that remind you of the event.	0	1	2	3
6.	Avoiding thoughts or feelings associated with the event.	0	1	2	3
7.	Feeling jumpy or easily startled.	0	1	2	3
8.	Feeling on guard.	0	1	2	3

2-Way Social Support Scale (2-Way SSS; Shakespeare-Finch & Obst, 2011)

This questionnaire explores social support that you give and receive from others.

For each item, please circle the number to indicate the degree to which you feel the statement is true for you in the past two weeks, using the scale below.

0	1	2	3	4	5
Not at all	Rarely	Occasionally	Often	Almost always	Always

1.	There is someone I can talk to about the pressures in my life.	0	1	2	3	4	5
2.	There is at least one person that I can share most things with.	0	1	2	3	4	5
3.	When I am feeling down there is someone I can lean on.	0	1	2	3	4	5
4.	There is someone in my life I can get emotional support from.	0	1	2	3	4	5
5.	There is at least one person that I feel I can trust.	0	1	2	3	4	5
6.	There is someone in my life that makes me feel worthwhile.	0	1	2	3	4	5
7.	I feel that I have a circle of people who value me.	0	1	2	3	4	5
8.	I am there to listen to other's problems.	0	1	2	3	4	5
9.	I look for ways to cheer people up when they are feeling down.	0	1	2	3	4	5
10.	People close to me tell me their fears and worries.	0	1	2	3	4	5
11.	I give others a sense of comfort in times of need.	0	1	2	3	4	5
12.	People confide in me when they have problems.	0	1	2	3	4	5
13.	If stranded somewhere there is someone who would get me.	0	1	2	3	4	5
14.	I have someone to help me if I am physically unwell.	0	1	2	3	4	5
15.	There is someone who would give me financial assistance.	0	1	2	3	4	5
16.	There is someone who can help me fulfil my responsibilities when I am unable.	0	1	2	3	4	5
17.	I help others when they are too busy to get everything done.	0	1	2	3	4	5
18.	I have helped someone with their responsibilities when they were unable to fulfil them.	0	1	2	3	4	5
19.	When someone I lived with was sick I helped them.	0	1	2	3	4	5
20.	I am a person others turn to for help with tasks.	0	1	2	3	4	5
21.	I give financial assistance to people in my life.	0	1	2	3	4	5

Post-traumatic Growth Inventory – Short Form (PTGI-SF; Cann et al., 2010)

Below is a list of changes people might experience after stressful life events.

Using the scale, please circle the number that best describes how much that change was experienced by you following the stressful event. Please respond to each item with your feelings in the past two weeks.

0	**1**	**2**	**3**	**4**	**5**
No change	Very small change	Small change	Moderate change	Great change	Very great change

1.	I changed my priorities about what is important in life.	0	1	2	3	4	5
2.	I have a greater appreciation for the value of my own life.	0	1	2	3	4	5
3.	I am able to do better things with my life.	0	1	2	3	4	5
4.	I have a better understanding of spiritual matters.	0	1	2	3	4	5
5.	I have a greater sense of closeness with others.	0	1	2	3	4	5
6.	I established a new path for my life.	0	1	2	3	4	5
7.	I know that I can handle difficulties better.	0	1	2	3	4	5
8.	I have a stronger religious faith.	0	1	2	3	4	5
9.	I discovered that I'm stronger than I thought I was.	0	1	2	3	4	5
10.	I learned a great deal about how wonderful people are.	0	1	2	3	4	5

Follow-up study

Would you consent to take part in an interview in a few months' time, based upon your responses to this questionnaire? It will specifically look at your experiences of positive personal growth following stressful events. *Please circle your response.*

YES **NO**

If you do consent to take part in an interview, your contact details will be recorded and kept securely on file by the researcher and separate from your responses on this questionnaire. If you agree to take part in the interview, but change your mind later, that is fine.

If you stated that you wish to take part in the follow-up interview, or wish to be entered into the £50 voucher prize draw, please state how you would like to be contacted (e.g. your phone number, email address, or postage address).

_____

_____

_____

Debrief

Thank you for taking part in this study. The aim was to investigate the factors that might help people achieve a positive outlook in the aftermath of stressful and traumatic experiences.

If you would like more information, have further questions about this study or to receive a copy of the overall findings, please contact me at the following address:

PhD student:
Matt Brooks mbrooks1@uclan.ac.uk

Supervisory team:
Dr. Michelle Lowe mlowe2@uclan.ac.uk
Dr. Nicola Graham-Kevan ngraham-kevan@uclan.ac.uk
Dr. Sarita Robinson sjrobinson1@uclan.ac.uk

✉ School of Psychology, Darwin Building, University of Central Lancashire, Preston, Lancashire, PR1 2HE.

The following organisations are trained to deal with the effects of traumatic situations, victimisation, bereavement or other stressful events. You may also seek advice from your key worker if required.

Cruse Bereavement Care -- support for those dealing with bereavement.
☎ 0844 477 9400
🖱 www.crusebereavementcare.org.uk

MIND -- information and advice for mental health issues.
☎ 0845 766 0163
🖱 www.mind.org.uk

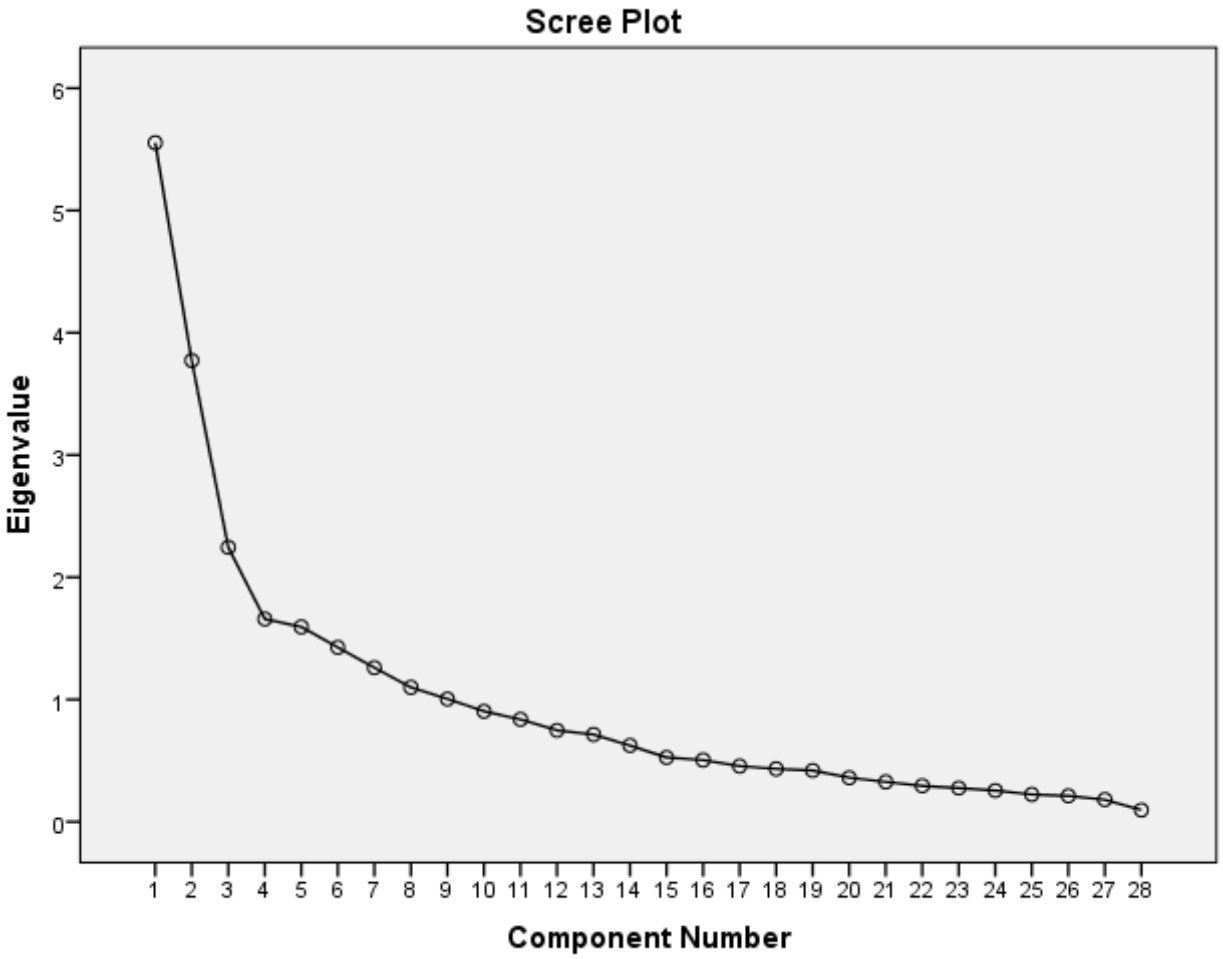
Preston Domestic Violence Services -- for male and female victims of domestic violence.
☎ 01772 201601
🖱 www.pdvs.org.uk

The Samaritans -- confidential emotional support.
☎ 01772 822022 (local branch)
🖱 www.samaritans.org

UCLan Counselling -- for UCLan students.
☎ 01772 892572
🖱 www.uclan.ac.uk/students/health/counselling

Victim Support -- free, confidential help to victims of crime, witnesses, and family and friends.
☎ 0845 30 30 900
🖱 www.victimsupport.org.uk

Appendix IV – Study 1b scree plot for principal components analysis of the Brief COPE



Appendix V – Study 1b factor loadings for the three-factor solution of the Brief COPE

Table 26. *Loadings for the three-factor solution of the Brief COPE.*

Original dimension	Item	Factor 1	Factor 2	Factor 3
UIS	I've been trying to get advice or help from other people about what to do.	.75		
UES	I've been getting comfort and understanding from someone.	.74		
UIS	I've been getting advice and help from other people.	.73		
UES	I've been getting emotional support from others.	.70		
REL	I've been praying or meditating.	.58		
REL	I've been trying to find comfort in my religion or spiritual beliefs.	.57		
VEN	I've been saying things to let my unpleasant feelings escape.	.45		
VEN	I've been expressing my negative feelings.	.43		
SB	I've been criticising myself.		.75	
SB	I've been blaming myself for things that have happened.		.72	
BD	I've been giving up the attempt to cope.		.68	
SU	I've been using alcohol or drugs to help get me through it.		.65	
SU	I've been using alcohol or drugs to make myself feel better.		.64	
BD	I've been giving up trying to deal with it.		.60	
DEN	I've been saying to myself "this isn't real".		.54	
DEN	I've been refusing to believe it has happened.		.43	
SD	I've been turning to work or other activities to take my mind off things.		.39	
SD	I've been doing something to think about it less, such as going to the movies, watching TV, reading, daydreaming, sleeping or shopping.		.39	
HUM	I've been making jokes about it.			.61
PLA	I've been trying to come up with a strategy about what to do.			.59
ACC	I've been accepting the reality of the fact it has happened.			.56
PLA	I've been thinking hard about what steps to take.			.56
HUM	I've been making fun of the situation.			.54
AC	I've been taking action to try to make the situation better.			.50
AC	I've been concentrating my efforts on doing something about the situation I am in.			.47
PR	I've been looking for something good in what is happening.			.44
PR	I've been trying to see it in a different light, to make it seem more positive.			.38
ACC	I've been learning to live with it.			.37
	Eigenvalue	5.55	3.77	2.24
	Cumulative % of variance explained	19.84	33.31	41.33

Note. ACC = Acceptance. AC = Active coping. BD = Behavioural disengagement. DEN = Denial. HUM = Humour. PLA = Planning. PR = Positive reframing. REL = Religion. SB = Self-blame. SD = Self-distraction. SU = Substance use. UES = Use of emotional support. UIS = Use of instrumental support. VEN = Venting.

Appendix VI – Study 1b reverse mediation models

While the specification of the models was based on prior theory and literature, recommendations for cross sectional mediation analyses (Preacher & Hayes, 2004) suggest that reverse models are tested to increase confidence in the hypothesised direction of relationships within the mediation model. Within these models, event characteristics preceded PTG as the latter arises from the emotional struggle with adversity (Tedeschi & Calhoun, 2004); however, the mediator and outcome (PTG) were substituted to allow for plausible bidirectional associations. For example, while intrusions, social support and spirituality may mediate associations between event characteristics and growth, literature also indicates that increased distress, enhanced relationships and greater spirituality are also a product of PTG (Tedeschi & Calhoun, 2004).

Results

None of the reverse mediation analyses for the interpersonal event and number of event types indicated significant indirect effects. However, bidirectional associations were revealed in the childhood event mediation model. Reverse models with PTG as the mediator indicated positive associations with active coping [b = .19, t = 7.43, p < .01; ab = -.76; ab_{cs} = -.07; BCa CI: -.12, -.02], emotional coping [b = .18, t = 7.74, p < .01; ab = -.75; ab_{cs} = -.07; BCa CI: -.13, -.02], intrusions [b = .06, t = 4.10, p < .01; ab = -.25; ab_{cs} = -.04; BCa CI: -.10, -.08], social support [b = .43, t = 4.91, p < .01; ab = -1.77; ab_{cs} = -.05; BCa CI: -.71, -.09] and spirituality [b = .67, t = 7.25, p < .01; ab = -.2.72; ab_{cs} = -.06; BCa CI: -.12, -.02], each demonstrating small indirect effects.

Discussion

For the childhood adversity reverse mediation models, PTG exerted significant indirect effects on active coping, emotional coping, intrusive thoughts, social support and spirituality. The findings are broadly in line with the FDM (Tedeschi & Calhoun, 2004) and the wider PTG literature (e.g. Linley & Joseph, 2004), that indicate that growth is

associated with enhanced well-being. Although unmeasured in this study, it is possible that those who report PTG can become more optimistic after overcoming prior traumas, which can lead individuals to adopt and rely on active coping strategies (Prati & Pietrantoni, 2009). 'Successful' coping attempts may therefore embolden individuals to deal with future events. Additionally, while studies of emotional strategies and PTG are limited (Larsen & Berenbaum, 2015), the positive association between emotional coping and social support may mean that emotional coping is a proxy for increased social support and expression following PTG. Therefore, active coping, avoidant coping and emotional coping are possible outcomes that may be reported as a result of growth.

Intrusive thoughts, social support and spirituality were found to mediate the indirect relationship between childhood adversity and PTG. The finding that intrusive thoughts exerted indirect effects is supported by existing models (e.g. Tedeschi & Calhoun, 2004) which construe intrusive thoughts as a driver of growth processes, and as a product of attempts to understand the event which can be distressing. A bidirectional mediation relationship was found between social support and PTG. Childhood adversity may create difficulty in forming social relationships that are necessary to develop additional perspectives needed for PTG (Courtois, 2008; Tedeschi & Calhoun, 2004), yet enhanced social support may also be a consequence of growth, thus confirming associations that were previously unclear in the literature (Linley & Joseph, 2004; Prati & Pietrantoni, 2009). Furthermore, available evidence suggests that spiritual beliefs can be enhanced or diminished following adverse events (Walker et al., 2009), although the mechanisms by which this occurs are presently unclear. Spiritual coping appears to be influenced by the developmental timing of the adverse event and PTG, which may allow survivors to find hope and meaning in their experiences (Tedeschi & Calhoun, 2004; Walker et al., 2009). Therefore, PTG following childhood adversity can entail more distress, but also more social support and spiritual coping in an attempt to find meaning.

It is also of interest that the childhood adversity model demonstrated these unique effects compared to the interpersonal and number of types of events models. Literature

has suggested that the developmental timing of adversity can be responsible for longstanding and pronounced psychological effects in adulthood (Breslau et al., 1999; Cloitre et al., 2009). The general finding in these studies is that childhood adversity can predispose individuals to experience exacerbated psychological and physiological responses to events in adulthood, perhaps through physiological impacts on the brains structure. The “vulnerability” that is created by childhood adversity could make adulthood survivors not only more likely to experience negative symptoms of a greater severity (Hagenaars et al., 2011), but equally likely to perceive PTG. For example, childhood adversity can lead to high cortisol levels which impact on brain neuroplasticity, heightening the fear response to threat (Lupien et al., 2009). Literature also indicates that, the survivor adopts coping strategies that are perceived to be adaptive in response to childhood adversity, including avoiding all memories of the event (Freyd, 1994), or active problem solving (Punamäki et al., 2004). The coping skills may be engrained within the child survivor into adulthood, which, depending on the strategy, may allow some to experience more (or less) growth following later life events.

Appendix VII – Study 2 ethics approval

24 March 2015

Nicola Graham-kevan/Matthew Brooks
School of Psychology
University of Central Lancashire

Dear Nicola/Matthew,

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC 143_2nd Stage**

The PSYSOC ethics committee has granted approval of your proposal application '**Aspects of growth in trauma-exposed individuals**'. Approval is granted up to the end of project date* or for 5 years from the date of this letter, whichever is the longer. It is your responsibility to ensure that

- the project is carried out in line with the information provided in the forms you have submitted
- you regularly re-consider the ethical issues that may be raised in generating and analysing your data
- any proposed amendments/changes to the project are raised with, and approved, by Committee
- you notify roffice@uclan.ac.uk if the end date changes or the project does not start
- serious adverse events that occur from the project are reported to Committee
- a closure report is submitted to complete the ethics governance procedures

(Existing paperwork can be used for this purposes e.g. funder's end of grant report; abstract for student award or NRES final report. If none of these are available use e-Ethics Closure Report Proforma).

Yours sincerely,

Cath Larkins
Deputy Vice-Chair
PSYSOC Ethics Committee

* for research degree students this will be the final lapse date

NB - Ethical approval is contingent on any health and safety checklists having been completed, and necessary approvals as a result of gained.

**Note. The PDS, PTGI-SF and a demographic questionnaire were also administered, but are not included in Appendix VII as copies are already provided in Appendix III.*

Participant Information Sheet

What is the study about?

This project is being conducted by Matthew Brooks (PhD student) from the University of Central Lancashire under the supervision of Dr Nicola Graham-Kevan and Dr Sarita Robinson. We are interested in how people deal with stressful situations. While these incidents are upsetting for people to experience, some people appear to become "stronger" as a result of these events. This study will explore people's experiences of change in the context of their life events.

What will I be asked to do?

You indicated that you would like to be contacted about a follow-up study to the one you participated in recently. If you agree to take part in this phase, you will firstly be asked to complete three brief questionnaires about traumatic events **in the last six months** (since the last time you participated in this research), your experiences of growth and optimism.

You have the option to complete the questionnaires either online or in person. If you decide to complete the questionnaire online but change your mind about your participation during this process, you can exit the questionnaire at any time where you will be taken to a screen to access the debrief information and details of support organisations. Your responses will also be removed from the study. If you complete the questionnaires online but decide not to attend the interview, that is fine as well. In this case, only your data from the questionnaires will be used for statistical analysis.

Following this, you will be invited to participate in an interview about your experiences of change as a result of your life experiences. **We would like to audio-record the interview** to ensure we can remember exactly what you say, and for analysis purposes. If you prefer not to be audio-recorded, that is fine as well and the researcher can make notes instead if you choose. The interview will last for approximately up to one hour and the questionnaires will take approximately 20 minutes to complete.

You may also complete the interview by telephone or the use of an instant messaging service, such as Skype, if you prefer. Please be assured that the data you provide will held securely in the same way as the face-to-face interview. All interviews will be arranged at a time convenient for you and held in private. Again, we would like to record the telephone or instant messaging conversations for transcribing the data later, although if you rather the conversations not be recorded and you prefer notes are made, that is absolutely fine. With programmes such as Skype, you do not have to be video recorded – we are only interested in what you have to say. You may end the interview at any time.

The nature of the study means that you may be asked about whether you have experienced traumatic events, such as sexual abuse. It is absolutely fine for you to not respond to a question

if it makes you feel uncomfortable in any way; you can simply ask the interviewer to move on to the next question.

You will also be invited to provide some personal information, such as your age, gender, ethnicity, sexuality, religious beliefs and occupation.

Do I have to take part? How will taking part in this study benefit me?

Your participation in this study is **voluntary** and you are under no obligation to continue. You can withdraw your responses at any time up until a week after the interview and questionnaires have been concluded. Your responses will be confidential, **however if you disclose any information that suggests you may harm yourself or others, the researcher will have to share that information with the appropriate support/legal organisations**, such as the Police. For your participation, you will receive a £10 Amazon voucher in recognition for the time you spent on the study.

In the long-term, your responses could help identify the reasons why people may or may not become stronger following stressful experiences. In addition, it is hoped that they will help improve the way in which people might seek help from services or develop strategies to help them adjust more positively following an upsetting situation.

What will happen to my responses?

The questionnaire responses you provide will be saved on a password-protected statistical database, and any questionnaires will be stored in a lockable filing cabinet. Your completed questionnaire will not be seen beyond the researcher and his supervisory team. Any audio recordings made from the face-to-face or telephone conversations, or data from instant messaging will be used to transcribe the interview and stored in a password-protected file. All data you provide will be held securely for a period of five years in accordance with British Psychological Society (BPS) guidelines and destroyed once that time has elapsed.

During the transcribing process, you will be assigned a pseudonym in place of your real name so that you will not be personally identifiable. The overall findings from this study may be published in a scientific journal or presented and will be seen by the general public; however, the quotes provided will be anonymised and so there is no way in which the responses you provide will be attributed to you personally.

There will be a follow-up study and I would also like people to be contacted about this in the future. You will be invited to leave your contact details if you wish to participate in that study. If you provide contact details, these will be kept securely and separately from your responses on this questionnaire on a password-protected document.

Further information

If you have any further questions about the study, please feel free to contact myself or my supervisors using the contact details provided at the end of these questionnaires.

Alternatively, if you have any concerns about this research project and wish to raise your concerns with somebody who is independent of the research team, you may contact the University Officer for Ethics (OfficerForEthics@uclan.ac.uk).

Consent form

Please indicate that you understand the nature of your participation by placing a tick in the appropriate box.

☑

☐	I have read the participant information sheet that has been given to me prior to completing this questionnaire, and understand the purpose of the study.
☐	I understand that my responses in this questionnaire will be only be shared between the research team at the University of Central Lancashire.
☐	**I am aware that if I disclose anything that suggests that I may seriously harm myself or others, the researcher will have to share that information with an appropriate person.**
☐	I understand that my results will be audio-recorded OR notes will be taken and transcribed for the purposes of analysis.
☐	I understand that overall results from this study will be written up and shared in publications or presentations, but that I can never be personally identified from them.
☐	I understand that I can stop the questionnaire and/or conversation at any time today, even after I have signed this form, and that I have one week to consider whether or not to withdraw my answers from the study, should I choose.
☐	I have read all of the above, and I am happy to continue my participation in this study.

Participant name (please print): _____

Participant signature: _____

Date: _____

Researcher name (please print): _____Matthew Brooks_____

Researcher signature: _____

Date: _____

Indicative questions are provided with supplementary questions depending on responses.

Building rapport/introduction

How has your week been?

Establishing history of adverse experiences

Can you tell me about your life experiences so far?

- Number/types of events as reported on questionnaires, and any others since
- Timing of events (childhood and/or adulthood)

Perceptions of growth

What does 'growth' following stressful events mean to you?

Do you feel you have achieved growth from your experiences?

- Was this a gradual process?
- How has growth impacted on your life?

Changes since the adverse experiences

How have you changed as a person since your experiences?

- What positive changes have occurred since the events? Why?
- What negative changes have occurred that are not so positive? Why?
- Has anything in your life remained the same or unchanged? Why?
- Have people close you noticed any changes in yourself?

If applicable, explore responses on Study 1 questionnaires

- (e.g. You indicated that you had lost your spirituality since the event, can you explain why?)

What do you think has helped you to experience growth?

If not mentioned, may prompt for:

- Coping styles
- Social support
- Thoughts and attitudes (e.g. optimism)
- Experiences of prior adversity

What barriers have there been to your growth?

If not mentioned, may prompt for:

- Coping styles
- Thoughts and attitudes (e.g. pessimism)
- Experiences of prior adversity

Closing the interview

How do you feel in yourself now?

Is there anything else you would like to add that you feel has not been addressed by the interview today?

Any other comments?

Is there anything else you would like to say in relation to your responses on this questionnaire or your experiences of growth?

Quotes may be taken from this text for use in the thesis or publications, but your identity will be protected.

Follow-up study

I would like to invite you to take part in a follow-up study on your experiences of growth. If you would like to be contacted in order to receive more information about this study, please leave the best method of contact below. If you say yes, but then change your mind when you are contacted again, that is fine as well.

Please note that any contact information you provide will be stored separately from your responses on the questionnaire or in the interview. Your contact details will be held on a password-protected database and will be stored for as long as your participation in the study continues. If you no longer decide to take part, be assured that your personal contact details will be removed from the database and you will not be contacted in relation to this study.

Please tick below as appropriate.

	☑
I am happy to be contacted about the follow-up study (please leave contact details below).	
I would not like to be contacted about the follow-up study.	

Please state the best method of contact below.

_____

_____

Debrief

Thank you for taking part in this study. The aim was to explore your experiences of growth following traumatic experiences in more details. People respond to trauma in different ways, and while the negative effects of trauma are well-known, the intention of the study is to help them focus on personal strengths that could be used to support people in trauma interventions.

If you would like more information, have further questions about this study or to receive a copy of the overall findings, please contact myself or my supervisors at the following email address, or write to the postal address provided below.

PhD student:
Matt Brooks mbrooks1@uclan.ac.uk

Supervisory team:
Dr. Nicola Graham-Kevan ngraham-kevan@uclan.ac.uk
Dr. Sarita Robinson sjrobinson1@uclan.ac.uk

✉ School of Psychology, Darwin Building, University of Central Lancashire, Preston, Lancashire, PR1 2HE.

The following organisations are trained to deal with the effects of traumatic situations, victimisation, bereavement or other stressful events. You may also seek advice from your key worker if required.

Cruse Bereavement Care -- support for those dealing with bereavement.
☎ 0844 477 9400
🖱 www.crusebereavementcare.org.uk

MIND -- information and advice for mental health issues.
☎ 0845 766 0163
🖱 www.mind.org.uk

Preston Domestic Violence Services -- for male and female victims of domestic violence.
☎ 01772 201601
🖱 www.pdvs.org.uk

The Samaritans -- confidential emotional support.
☎ 01772 822022 (local branch)
🖱 www.samaritans.org

UCLan Counselling -- for UCLan students.
☎ 01772 892572
🖱 www.uclan.ac.uk/students/health/counselling

Victim Support -- free, confidential help to victims of crime, witnesses, and family and friends.
☎ 0845 30 30 900
🖱 www.victimsupport.org.uk

Appendix IX – Study 3 ethics approval

3 December 2015

Matthew Brooks/Nicola Graham-kevan/Sarita Jane Robinson
School of Psychology
University of Central Lancashire

Dear Matthew, Nicola & Sarita,

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC143_3rd Phase**

The PSYSOC ethics committee has granted approval of your proposal application 'Trajectories of post-traumatic growth in survivors of multiple trauma'. Approval is granted up to the end of project date* or for 5 years from the date of this letter, whichever is the longer.

It is your responsibility to ensure that

- the project is carried out in line with the information provided in the forms you have submitted
- you regularly re-consider the ethical issues that may be raised in generating and analysing your data
- any proposed amendments/changes to the project are raised with, and approved, by Committee
- you notify roffice@uclan.ac.uk if the end date changes or the project does not start
- serious adverse events that occur from the project are reported to Committee
- a closure report is submitted to complete the ethics governance procedures (Existing paperwork can be used for this purposes e.g. funder's end of grant report; abstract for student award or NRES final report. If none of these are available use e-Ethics Closure Report Proforma).

Yours sincerely,

K. Chantler

Khatidja Chantler
Chair
PSYSOC Ethics Committee

* for research degree students this will be the final lapse date

NB - Ethical approval is contingent on any health and safety checklists having been completed, and necessary approvals as a result of gained.

**Note. The PDS, PTGI-SF and a demographic questionnaire were also administered, but are not included in Appendix VII as copies are already provided in Appendix III.*

Participant Information Sheet

What is the study about?

This project is being conducted by Matthew Brooks (PhD researcher) from the University of Central Lancashire under the supervision of Dr Nicola Graham-Kevan and Dr Sarita Robinson. We are interested in how people respond to stressful situations, and particularly how some people become "stronger" as a result of their experiences. This study will explore the ways in which people think about their events and more generally, and how this influences their growth from trauma.

What will I be asked to do?

If you agree to take part, you will be asked to complete six brief questionnaires. These questionnaires will ask about traumatic events your current perception of growth, the way in which you ruminate/dwell and reflect on your experiences and more generally, and how much control over your life you feel you have.

You have the option to complete the questionnaires either online or in person. The questionnaires will take approximately 20-30 minutes to complete. If you decide to complete the questionnaire in person, you can do so in a private room at the university at a time convenient for you. In this event, please contact Matthew Brooks using the details provided on this form to arrange an appropriate time.

If you decide to complete the questionnaire online but change your mind about your participation during this process, you can exit the questionnaire at any time where you will be taken to a screen to access the debrief information and details of support organisations. Your responses will also be removed from the study.

The nature of the study means that you may be asked about whether you have experienced traumatic events, such as sexual abuse. It is absolutely fine for you to not respond to a question if it makes you feel uncomfortable in any way; you can simply move on to the next question.

You will also be invited to provide some personal information, such as your age, gender, ethnicity, sexuality, religious beliefs and occupation.

Do I have to take part? How will taking part in this study benefit me?

Your participation in this study is **voluntary** and you are under no obligation to continue. You can withdraw your responses at any time up until a week after the questionnaires have been submitted. Your responses will be confidential, **however if you disclose any information that suggests you are at imminent risk of harm to yourself or others, or from harm by others, the researcher will have to share that information with the appropriate support/legal organisations**, such as the Police. You will be informed by the researcher beforehand should this

course of action occur. For your participation, you will be entered into a prize draw for a £50 Amazon voucher.

In the long-term, your responses could help identify the reasons why people may or may not experience positive changes following stressful experiences. In addition, it is hoped that they will help improve the way in which people might seek help from services or develop strategies to help them adjust more positively following trauma.

What will happen to my responses?

The questionnaire responses you provide will be saved on a password-protected database, and any questionnaires will be stored in a lockable filing cabinet. Your completed questionnaire will not be seen beyond the researcher and his supervisory team. All data you provide will be held securely for a period of five years in accordance with British Psychological Society (BPS) guidelines and destroyed once that time has elapsed.

Further information

If you have any further questions about the study, please feel free to contact myself or my supervisors using the contact details provided at the end of this set of questionnaires.

Consent Form

Please indicate that you understand the nature of your participation by placing a tick in the appropriate box.

☑

☐	I have read the participant information sheet that has been given to me prior to completing this questionnaire, and understand the purpose of the study.
☐	I understand that my responses in this questionnaire will be only be shared between the research team at the University of Central Lancashire.
☐	**I am aware that if I disclose anything that suggests that I may seriously harm myself or others, or be at imminent risk of harm from others, the researcher will have to share that information with an appropriate person. I understand I will be informed of this course of action beforehand.**
☐	I understand that overall results from this study will be written up and shared in publications or presentations, but that I can never be personally identified from them.
☐	I understand that I can stop the questionnaire at any time today, even after completing this form, and that I have one week to consider whether or not to withdraw my answers from the study, should I choose.
☐	I have read all of the above, and I am happy to continue my participation in this study.

Participant name (please print): _____

Participant signature: _____

Date: _____

Researcher name (please print): _____Matthew Brooks_____

Researcher signature: _____

Date: _____

Event-related Rumination Inventory (Cann et al., 2011)

After experiences like the one you reported, people sometimes find themselves having thoughts about their experience, even though they don't try to think about it. Using the scale, please indicate how often, you had the thoughts described **in the past TWO weeks**.

0	**1**	**2**	**3**
Not at all	Rarely	Sometimes	Often

1.	I thought about the event when I did not mean to.	0	1	2	3
2.	Thoughts about the event came to mind and I could not stop thinking about them.	0	1	2	3
3.	Thoughts about the event distracted me or stopped me from being able to concentrate.	0	1	2	3
4.	I could not keep images or thoughts of the event from entering my mind.	0	1	2	3
5.	Thoughts, memories, or images of the event came to mind even when I did not want them.	0	1	2	3
6.	Thoughts about the event caused me to relive my experience.	0	1	2	3
7.	Reminders of the event brought back thoughts about my experience.	0	1	2	3
8.	I found myself automatically thinking about what had happened.	0	1	2	3
9.	Other things kept leading me to think about my experience.	0	1	2	3
10.	I tried not to think about the event, but could not keep the thoughts from my mind.	0	1	2	3

Below, please indicate how much time you have spent deliberately thinking about the event **in the past TWO weeks.**

1.	I thought about whether I could find meaning from my experience.	0	1	2	3
2.	I thought about whether changes in my life have come from dealing with my experience.	0	1	2	3
3.	I forced myself to think about my feelings from the experience.	0	1	2	3
4.	I thought about whether I have learned anything as a result of my experience.	0	1	2	3
5.	I thought about whether the experience has changed my beliefs about the world.	0	1	2	3
6.	I thought about what the experience my mean for my future.	0	1	2	3
7.	I thought about whether my relationships with others have changed following my experience.	0	1	2	3
8.	I forced myself to deal with my feelings about the event.	0	1	2	3
9.	I deliberately thought about how the event affected me.	0	1	2	3
10.	I thought about the event and tried to understand what happened.	0	1	2	3

Perceived Control Over Stressful Events Scale (Frazier et al., 2011)

Using the following scale, please answer these questions with regard to the **most serious event** you have experienced. Please respond with regard to **how you have felt in the PAST TWO WEEKS** (or since the event, if it was less than 2 weeks ago).

0	**1**	**2**	**3**
Strongly disagree	Disagree	Agree	Strongly agree

1.	I could have done something to prevent this event from happening.	0	1	2	3
2.	There isn't much I can do to help me feel better about the event.	0	1	2	3
3.	How I deal with the event is now under my control.	0	1	2	3
4.	There is nothing I could have done to prevent this event from occurring.	0	1	2	3
5.	I don't have much emotional control over my emotional reactions to the event.	0	1	2	3
6.	I can do things to make sure I will not experience a similar event in the future.	0	1	2	3
7.	When I am upset about the event, I can find a way to do better.	0	1	2	3
8.	This event happened because of something I did or did not do.	0	1	2	3
9.	I have control over my day-to-day reactions over the event.	0	1	2	3
10.	There is nothing I can do to prevent a similar event from happening again.	0	1	2	3
11.	There isn't much I can do to keep the event from affecting me.	0	1	2	3
12.	I didn't have any control over the event occurring.	0	1	2	3
13.	I have control over how I think about the event.	0	1	2	3
14.	I have no control whether a similar event happens to me again.	0	1	2	3
15.	I couldn't have prevented it.	0	1	2	3
16.	My reaction to the event is not under my control.	0	1	2	3
17.	There are things I can do to reduce the risk that a similar event will happen again.	0	1	2	3

Centrality of Events Scale (Berntsen & Rubin, 2006)

Please think back upon the most serious traumatic event in your life and answer the following questions:

0	**1**	**2**	**3**	**4**
Totally disagree	Somewhat disagree	Neutral	Somewhat agree	Totally agree

1.	I feel that the event has become part of my identity.	0	1	2	3	4
2.	This event has become a reference point for the way I understand myself and the world.	0	1	2	3	4
3.	I feel that the event has become a central part of my life story.	0	1	2	3	4
4.	The event has coloured the way I think and feel about other experiences.	0	1	2	3	4
5.	The event permanently changed my life.	0	1	2	3	4
6.	I often think about the effects the event will have on my future.	0	1	2	3	4
7.	The event was a turning point in my life.	0	1	2	3	4

Please indicate below if you wish to be entered for a £50 Amazon prize draw by providing an email address to contact you in the event of being selected.

Debrief

Thank you for taking part in this study. The aim was to explore the way in which you think can influence how you respond and potentially grow from a traumatic event. We expect that the level at which people ruminate or dwell on events, reflect on their significance and have control over the lives may influence the degree of growth reported.

If you would like more information, have further questions about this study or to receive a copy of the overall findings, please contact myself or my supervisors using the details below.

PhD researcher contact details:
Matt Brooks mbrooks1@uclan.ac.uk

Supervisory team contact details:
Dr. Nicola Graham-Kevan ngraham-kevan@uclan.ac.uk
Dr. Sarita Robinson sjrobinson1@uclan.ac.uk

✉ School of Psychology, Darwin Building, University of Central Lancashire, Preston, Lancashire, PR1 2HE.

Alternatively, if you have any concerns about this research project and wish to raise your concerns with somebody who is independent of the research team, you may contact the University Officer for Ethics (OfficerForEthics@uclan.ac.uk).

The following organisations are trained to deal with the effects of traumatic situations, victimisation, bereavement or other stressful events. You may also seek advice from your key worker if preferred.

ChildLine -- telephone support and counselling service for children and young people.
☎ 0800 1111; 🖱 www.childline.org.uk

Cruse Bereavement Care -- telephone and face to face support for those dealing with bereavement.
☎ 0844 477 9400; 🖱 www.crusebereavementcare.org.uk

MIND -- information and advice for mental health issues.
☎ 0845 766 0163; 🖱 www.mind.org.uk

The Samaritans -- confidential emotional support.
☎ 08457 90 90 90; 🖱 www.samaritans.org

The Survivors Trust – support for male and female victims of sexual abuse and rape.
☎ 01788 550554; 🖱 www.thesurvivorstrust.org

UCLan Counselling -- for UCLan students.
☎ 01772 892572; 🖱 www.uclan.ac.uk/students/health/counselling

Victim Support -- free, confidential help to victims of crime, witnesses, and family and friends.
☎ 0845 30 30 900; 🖱 www.victimsupport.org.uk

Appendix XI – Study 3 descriptive data and correlations between variables *prior* to item removal

Table 27. *Descriptive data and correlations between variables in the final structural model before item removal (N = 250).*

Variable	*M*	*SD*	Min.	Max.	Skew.	Kurt.	1	2	3	4	5	6	7
1. Event centrality	18.78	7.76	0	28	-.87	-.15	-						
2. Intrusive rumination	13.72	9.42	0	30	.10	-1.26	.58***	-					
3. Deliberate rumination	13.08	8.98	0	30	.14	-1.17	.50***	.64***	-				
4. Present control	13.39	4.51	0	24	-.26	.00	-.27***	-.38***	-.12	-			
5. Future control	6.42	3.22	0	12	-.21	-.59	.01	.00	.07	.25***	-		
6. Posttraumatic stress	10.26	7.25	0	24	.19	-1.21	.48***	.74***	.12	-.36***	.03	-	
7. Posttraumatic growth	22.37	11.40	0	50	.02	-.75	.26***	.07	.24***	.26***	.22***	.04	-

Note. Min. = minimum reported value; Max. = maximum reported value; Skew. = skewness; Kurt. = kurtosis. * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix XII – Study 3 additional analysis of correlations between event characteristics and cognitive variables

Table 28. *Additional analysis of correlations between event characteristics and cognitive variables in Study 3 (N = 250) before item removal.*

Variable	1	2	3	4	5	6	7	8	9	10
1. Interpersonal event	-									
2. Number of event types	.48***	-								
3. Childhood adversity	.16*	.15*	-							
4. Event centrality	.13*	.25***	-.01	-						
5. Intrusive rumination	.17***	.28***	.04	.58***	-					
6. Deliberate rumination	.06	.21**	.06	.50***	.64***	-				
7. Present control	-.14*	-.13*	-.13*	-.27***	-.39***	-.13*	-			
8. Future control	.11	.07	.09	-.01	.00	.07	.25***	-		
9. Posttraumatic stress	.25***	.36***	.21**	.48***	.74***	.57***	-.36***	.03	-	
10. Posttraumatic growth	-.08	.00	.02	.26***	.06	.24***	.26***	.22***	.04	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Interpersonal event was dummy coded (0 = no interpersonal event; 1 = interpersonal event). Childhood adversity was dummy coded (0 = no childhood adversity; 1 = childhood adversity).

Appendix XIII – Study 4 adapted PDS checklist (Foa et al., 1997)

**Note. The PTSD-8 was also administered in Study 4 and a copy is provided in Appendix III.*

Previous Experiences

This questionnaire asks about many types of traumatic event you may have experienced, **some of which you may find distressing**.

For each type of event, please indicate how many times this has occurred to the best of your memory in the past six months. If you have not experienced a particular event, leave the responses blank and please move to the next item.

Have you experienced a traumatic event(s) in the past six months? *Please circle.* **YES NO**
If yes, please complete the below all that applies. If no, please go to the next questionnaire.

		How many times in the past six months?
1.	Accident (e.g. car, train, industrial)	
2.	Natural disaster (e.g. fire, hurricane, tornado, earthquake)	
3.	Serious attack or threat(s) by partner	
4.	Serious attack or threat(s) by other(s)	
5.	Sexual abuse	
6.	Rape by partner	
7.	Rape by other(s)	
8.	Imprisonment or hostage	
9.	Terrorism, conflict, political violence or war zone	
10.	Serious or terminal illness, medical negligence	
11.	Unexpected death or separation of/from family member or close friend	
12.	Parental neglect or abuse	
13.	Directly witnessing any of these events happen to someone	
14.	Exposure to any of these events through work that has resulted in stress	
15.	Any other serious event(s) - please specify below:	

Appendix XIV– Study 4a visualisation of non-significant growth curve models

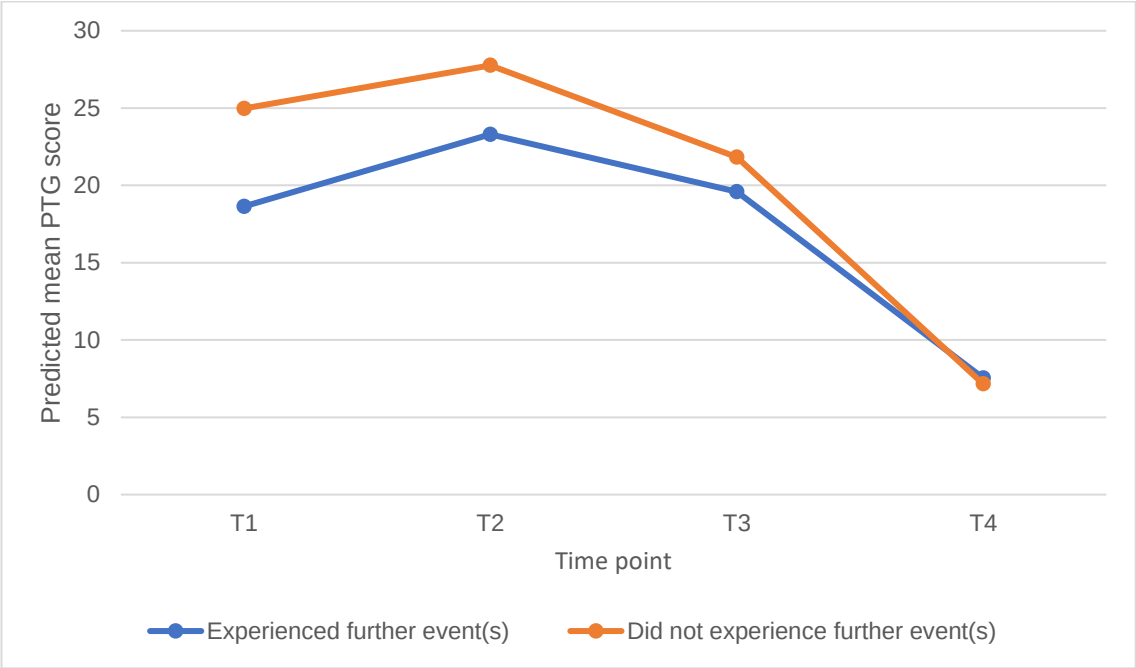


Figure 14. Predicted PTG trajectories as a function of experiencing further events, controlling for event characteristics and intrusive thoughts.

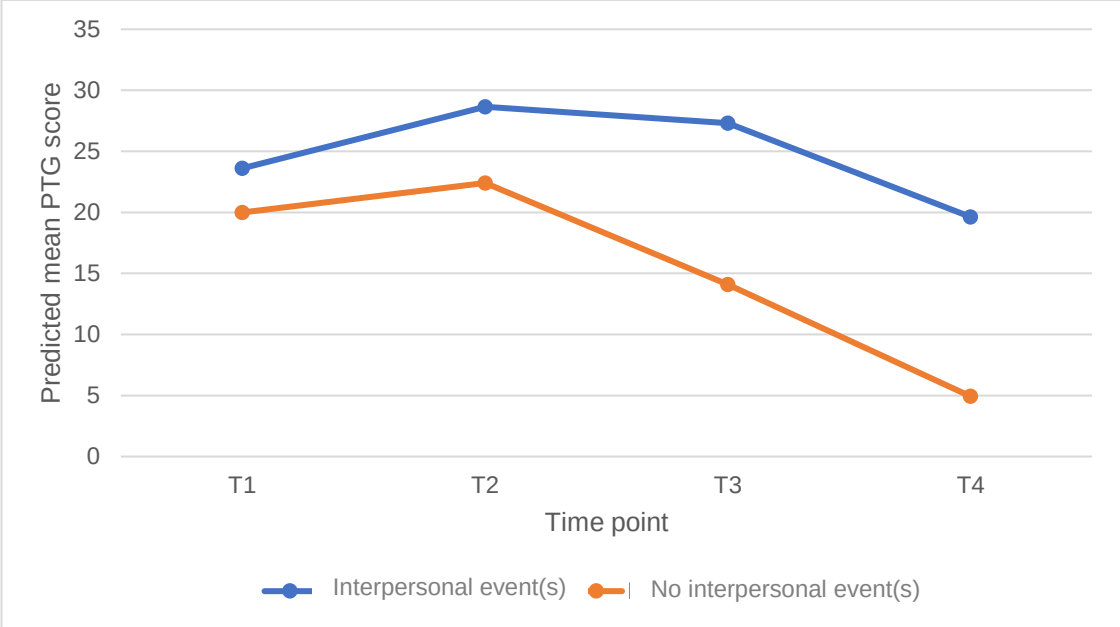


Figure 15. Predicted PTG trajectories as a function of experiencing interpersonal events, controlling for event characteristics and intrusive thoughts.

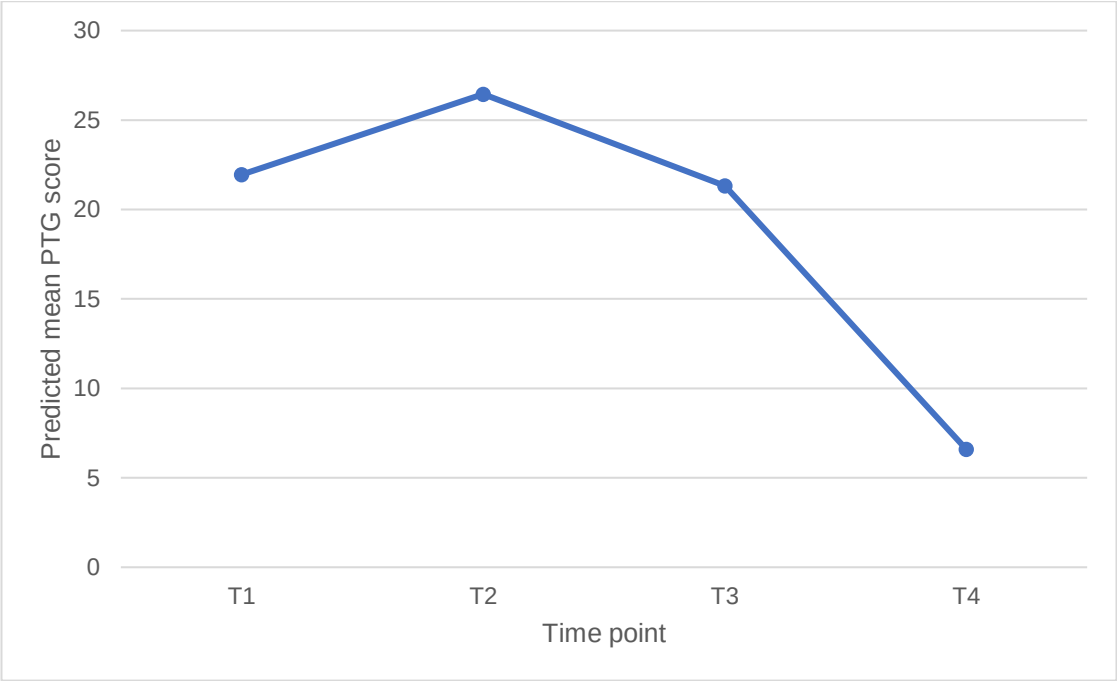


Figure 16. Predicted PTG trajectory for experiencing multiple event types, controlling for other event characteristics and intrusive thoughts.

Appendix XV – Study 4b two and three cluster longitudinal growth trajectory solutions

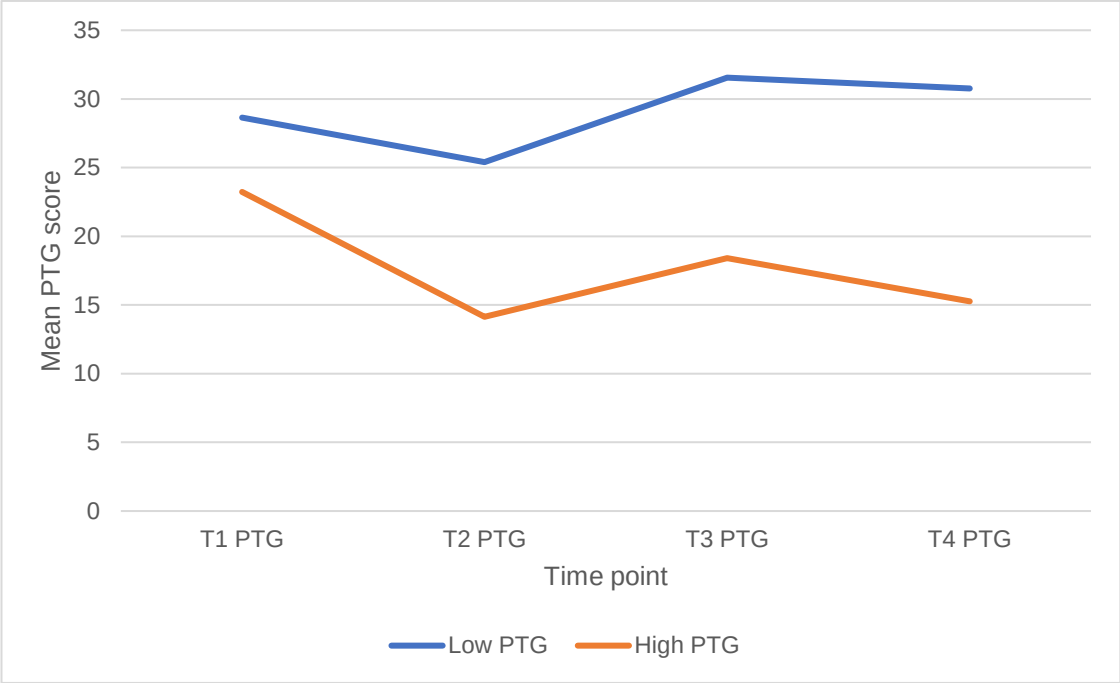


Figure 17. Two-cluster solution of longitudinal PTG trajectories.

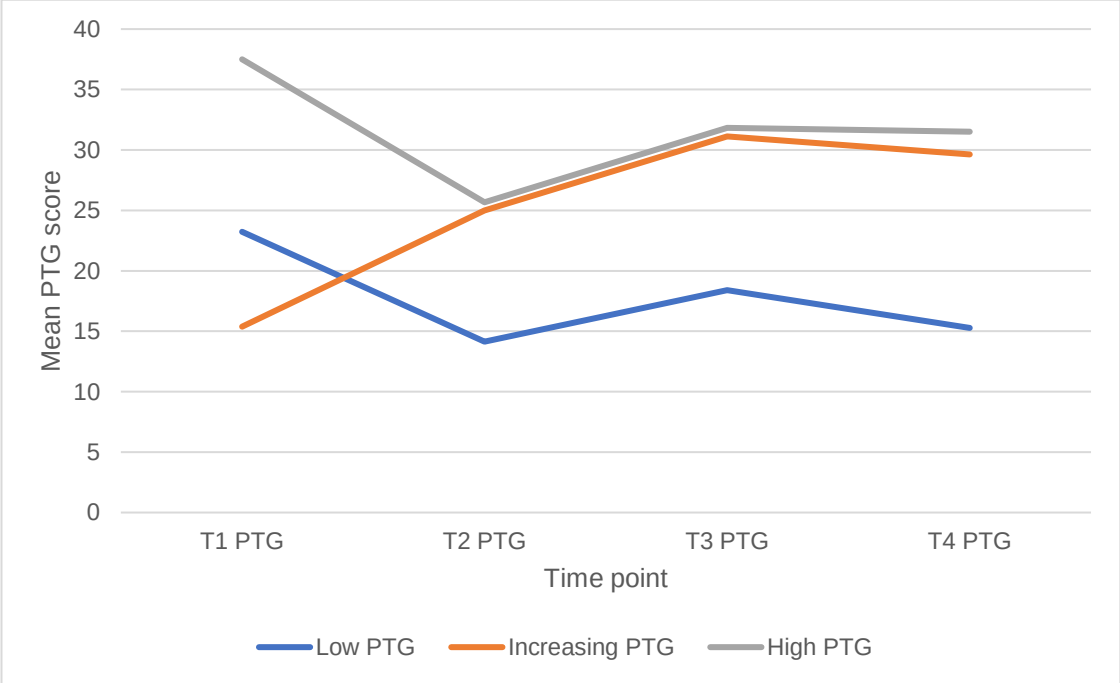


Figure 18. Three-cluster solution of longitudinal PTG trajectories.

Appendix XVI – Study 4b four-cluster solution *prior* to data integration

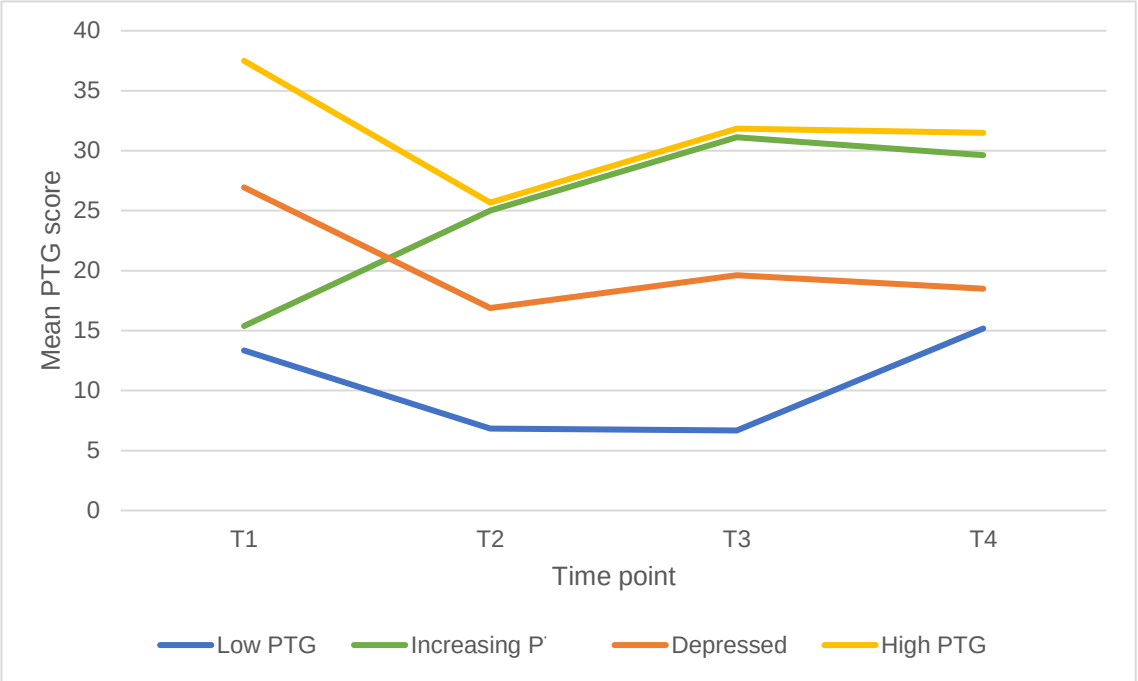


Figure 19. Graphed PTG trajectories prior to data integration.

Appendix XVII – Study 4b demographic, adverse event and psychosocial characteristics of four-cluster solution *prior* to data integration

Table 29. *Demographic, adverse event and psychosocial characteristics of four posttraumatic growth clusters before data integration.*

Characteristic	Low PTG (*N* = 6)		Increasing PTG (*N* = 8)		Decreasing PTG (*N* = 16)		High PTG (*N* = 12)		Test of difference	Post-hocs	Effect size
	N	%	*N*	%	*N*	%	*N*	%	χ^2		Cramer's *V*
Female gender	5	83.3	5	62.5	12	75.0	8	66.7	.99	n.s.	.15
White ethnicity	5	83.3	6	75.0	12	75.0	9	75.0	.21	n.s.	.07
Heterosexual orientation	4	66.7	6	75.0	10	62.5	10	83.3	6.27	n.s.	.19
Single	5	83.3	2	25.0	5	31.3	4	33.3	1.63	n.s.	.39
Religious	3	50.0	7	87.5	9	56.3	5	41.7	4.79	n.s.	.32
Disabled	0	0.0	0	0.0	1	6.3	0	0.0	3.26	n.s.	.19
T1 experienced event	6	100.0	8	100.0	16	100.0	12	100.0	-	-	-
T2 experienced event	3	50.0	4	50.0	7	43.8	7	58.3	.59	n.s.	.12
T3 experienced event	1	16.7	2	25.0	4	25.0	5	41.7	1.56	n.s.	.19
T4 experienced event	4	66.7	3	37.5	7	43.8	6	50.0	1.34	n.s.	.18
Experienced event at any time	4	66.7	4	50.0	9	56.3	7	58.3	.41	n.s.	.10
Experienced event at each time	0	0.0	1	12.5	1	6.3	3	33.3	5.67	n.s.	.36
T1 interpersonal event	5	83.3	4	50.0	12	75.0	7	58.3	2.68	n.s.	.25
T2 interpersonal event	2	33.3	1	12.5	4	25.0	2	16.7	1.17	n.s.	.17
T3 interpersonal event	1	16.7	1	12.5	0	0.0	1	8.3	3.30	n.s.	.24
T4 interpersonal event	1	16.7	2	25.0	4	25.0	5	41.7	3.64	n.s.	.42
Childhood adversity	4	66.7	4	50.0	11	68.8	6	50.0	1.44	n.s.	.19

(cont.)

	Low PTG (*N* = 6)		Increasing PTG (*N* = 8)		Decreasing PTG (*N* = 16)		High PTG (*N* = 12)		Test of difference	Post-hocs	Effect size
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*		η^2
Age (years)	30.00	5.90	32.38	10.81	37.88	12.52	39.00	18.05	.89	n.s.	.07
T1 number of event types	3.17	2.64	4.25	3.54	4.75	2.72	3.67	2.61	.59	n.s.	.05
T2 number of event types	.83	.98	1.13	1.73	.88	1.41	.75	.76	.14	n.s.	.01
T3 number of event types	.50	1.22	.25	.71	.38	.72	.42	.67	.13	n.s.	.01
T4 number of event types	.67	.52	.75	1.36	.88	1.50	1.00	.93	.11	n.s.	.01
T1 PTG	13.33	6.59	15.38	4.81	26.94	5.04	37.50	6.14	37.36***	3 > 1; 3 > 2; 4 > 1; 4 > 2; 4 > 3	.75
T2 PTG	6.83	3.54	25.00	7.13	16.88	6.62	25.67	6.75	14.23***	2 > 1; 2 > 3; 3 > 1; 4 > 1; 4 > 3	.53
T3 PTG	6.67	7.84	31.13	6.66	19.63	11.01	31.83	6.94	8.27***	2 > 1; 2 > 3; 4 > 1; 4 > 3	.39
T4 PTG	14.17	7.08	29.63	10.49	18.50	9.58	31.50	8.57	12.19***	2 > 1; 2 > 3; 4 > 1; 4 > 3	.49
T1 PTS intrusions	6.83	2.99	5.38	3.66	6.31	3.53	6.67	3.03	.30	n.s.	.02
T3 PTS intrusions	4.33	4.68	4.13	4.57	3.81	3.37	5.75	3.82	.60	n.s.	.05
T4 PTS intrusions	2.17	2.40	4.63	4.72	3.38	3.46	4.75	2.86	.98	n.s.	.07
T1 spirituality	27.00	18.80	36.13	19.49	31.75	18.26	41.91	25.41	.87	n.s.	.06
T1 active coping	19.17	4.49	16.13	4.76	16.44	5.59	19.33	4.70	1.17	n.s.	.08
T1 avoidant coping	9.50	6.16	11.38	6.28	8.75	4.23	10.08	5.00	.49	n.s.	.04
T1 emotional coping	7.83	3.49	10.25	4.06	8.56	4.55	14.33	4.31	5.12***	4 > 1; 4 > 3	.29
T1 social support	23.17	10.28	21.75	8.46	24.00	9.31	27.08	9.10	.34	n.s.	.03
T3 intrusive rumination	9.83	9.95	16.63	10.16	14.50	9.50	13.83	9.08	.60	n.s.	.05
T3 deliberate rumination	13.33	8.69	15.75	9.47	14.00	8.36	14.25	7.30	.12	n.s.	.01
T3 event centrality	17.17	9.91	18.38	6.63	21.75	4.95	19.00	7.04	.93	n.s.	.07
T3 present control	13.67	5.16	16.00	6.05	12.50	4.65	15.61	2.52	1.37	n.s.	.10
T3 future control	6.67	1.97	6.63	3.93	6.38	3.46	7.08	3.48	.10	n.s.	.01

Note. n.s. = not significant; * $p < .05$, ** $p < .01$, *** $p < .001$.

Appendix XVIII – Study 4b qualitative ratings of four coders alongside SPSS clusters

Table 30. *Qualitative ratings of four coders alongside SPSS-determined clusters.*

Participant	SPSS cluster	Coder 1	Coder 2	Coder 3	Coder 4
1	1	1	1	1	1
2	3	1	1	1	1
3	2	1	2	2	2
4	2	4	4	4	4
5	4	4	4	4	4
6	3	3	3	3	4
7	3	3	3	3	2
8	3	3	3	3	3
9	4	4	4	4	4
10	3	4	3	4	4
11	1	2	2	2	4
12	1	1	1	1	1
13	3	1	1	1	1
14	1	3	3	3	3
15	2	2	2	2	3
16	4	4	4	3	4
17	2	2	2	2	2
18	3	4	4	4	4