Social Support Following Pregnancy Loss and its Implications for Women’s Experiences of Posttraumatic Growth

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Social Support Following Pregnancy Loss and its Implications for Women’s Experiences of Posttraumatic Growth

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A Dissertation Submitted to The Graduate School at the University of Missouri-St. Louis in partial fulfillment of the requirements for the degree Doctor of Philosophy in Education with an emphasis in Counseling

December 2020

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Abstract

The available literature suggests that social support can contribute to individuals’ positive psychological changes following a traumatic event. However, the effects of the social milieu following pregnancy loss on women’s post-loss adjustment continues to be vastly unexplored. This dissertation explores a gap in the literature surrounding the relationship of interpersonal and intrapersonal social factors on women’s posttraumatic growth (PTG) after miscarriage or stillbirth via three studies. Specifically, the following factors were investigated in relation to PTG: 1) Adult attachment and women’s experiences of dyadic coping; 2) self-disclosure, positive social reactions and deliberate rumination; 3) empathy and prosocial behaviors. Women who had experienced miscarriage or stillbirth were recruited online and completed an online survey that assessed the above mentioned variables as well as demographics and loss context factors. The hypotheses were tested via hierarchical multiple regression, analysis of variance and the PROCESS macro. Overall, the findings across the three studies provide some support for applying PTG theory to women who have experienced pregnancy loss, highlighting the importance of social support in facilitating positive psychological change after the trauma of miscarriage or stillbirth. Specific findings, clinical implications, limitations and recommendations for future research are included in each manuscript.

Keywords: Pregnancy Loss, Posttraumatic Growth, Social Support, Miscarriage, Stillbirth
### Table of Contents

Cover Page ........................................................................................................................................ 1

Abstract ........................................................................................................................................... 2

Acknowledgements .......................................................................................................................... 5

**Section One: Introduction** ........................................................................................................ 6  
  Statement of Problem .................................................................................................................. 7  
  Significance of the Study ............................................................................................................ 9  
  Theoretical Foundation ............................................................................................................... 11  
  PTG and Pregnancy Loss ........................................................................................................... 13  
  Section Conclusion ..................................................................................................................... 16

**Section Two: Methods** ............................................................................................................. 17  
  Section Overview ...................................................................................................................... 17  
  Hypotheses ................................................................................................................................... 17  
  Participants .................................................................................................................................. 18  
  Measures ..................................................................................................................................... 19  
  Procedures ................................................................................................................................... 21  
  Data Analysis .............................................................................................................................. 22  
  Section Conclusion ..................................................................................................................... 25

**Section Three: Manuscripts** .................................................................................................... 26  
  Manuscript 1: Interpersonal and Intrapersonal Factors Contributing to Women’s Posttraumatic Growth Following Pregnancy Loss ................................................................................... 26  
  Manuscript 2: Can We Talk About It? The Relationship Between Disclosure and Posttraumatic Growth Following Miscarriage ................................................................................. 53  
  Manuscript 3: From Isolation to Connection: Empathy, Prosocial Behavior and Posttraumatic Growth Following Pregnancy Loss .................................................................................. 82

**Section Four: Discussion** ........................................................................................................ 111  
  Findings ...................................................................................................................................... 112  
  Implications ................................................................................................................................. 113  
  Limitations .................................................................................................................................. 116  
  Future Research ........................................................................................................................... 117  
  Section Conclusion ..................................................................................................................... 120

References ...................................................................................................................................... 121

Appendices
  Appendix A: IRB documents ........................................................................................................ 139  
  Appendix B: Demographic Items ................................................................................................. 151  
  Appendix C: Loss Context Factors ............................................................................................. 153  
  Appendix D: Posttraumatic Growth Inventory .......................................................................... 155  
  Appendix E: Experiences in Close Relationship Scale-Short ..................................................... 156
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Dyadic Coping Inventory</td>
<td>157</td>
</tr>
<tr>
<td>G</td>
<td>Distress Disclosure Index</td>
<td>160</td>
</tr>
<tr>
<td>H</td>
<td>Social Reactions Questionnaire</td>
<td>161</td>
</tr>
<tr>
<td>I</td>
<td>The Event Related Rumination Inventory</td>
<td>162</td>
</tr>
<tr>
<td>J</td>
<td>Prosocial Behavior</td>
<td>163</td>
</tr>
<tr>
<td>K</td>
<td>Interpersonal Reactivity Inventory</td>
<td>165</td>
</tr>
<tr>
<td>L</td>
<td>Figures and Tables: Manuscript 1</td>
<td>167</td>
</tr>
<tr>
<td>M</td>
<td>Figures and Tables: Manuscript 2</td>
<td>172</td>
</tr>
<tr>
<td>O</td>
<td>Figures and Tables: Manuscript 3</td>
<td>181</td>
</tr>
</tbody>
</table>
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Section 1

Introduction

Social support is considered one of the main factors contributing to positive adjustment following a traumatic event. Having a network of individuals that can offer emotional and behavioral support has been linked to a decrease in negative mental health outcomes (Juth et al., 2015; Kawachi & Berkman, 2001) and fosters positive psychological changes (Dong et al., 2017; Sattler et al., 2014; Yu et al., 2014). However, this relationship is unclear in the circumstances of pregnancy loss given the unique aspects of the type of loss and subsequently the type and amount of social support that is received. Due to continued social stigma surrounding the topic of pregnancy loss (Bierely-Jones et al., 2015; Markin & Zilcha-Mano, 2018), misinformation in the general public regarding the impact of pregnancy on an individual's adjustment (Bellhouse et al., 2018), and social constraints placed on the grieving process (Lang et al., 2011), well-intended social support can sometimes be paradoxically detrimental to an individual's mental health outcomes and overall well-being following pregnancy loss (Meyer, 2016). Therefore, understanding the factors, limitations, and mechanisms through which social support can foster positive psychological change following pregnancy loss can inform clinical practice and the provision of adequate social support systems.

The purpose of the studies was to investigate how social support can contribute to an individual's experience of posttraumatic growth (PTG; Tedeschi & Calhoun, 1996) following pregnancy loss. PTG refers to the to the “positive psychological changes experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). For growth to occur, the event has to shatter an
individual's core beliefs (Tedeschi & Calhoun, 2004). Through cognitive processes facilitated by social support, individuals can experience growth (Tedeshi et al., 2018). There is a growing body of literature that shows that women can experience PTG following pregnancy loss (Freedle & Kashubeck-West, 2020; Krosh & Shakespeare-Finch, 2017; Lafarge, 2019). However, the mechanisms associated with that change continue to be vastly unexplored in this population. To date only one known study has investigated the relationship between social support and PTG. The study focused specifically on the impact of engaging in prosocial behaviors on women’s levels of PTG following stillbirth (Cacciatore et al., 2018). To address the gap in the current literature this dissertation explored factors associated with social support and how each factor might facilitate the PTG process, as well as how PTG is measured as an outcome. Collectively, the three proposed studies provide a broader framework of how social support contributes to the experience of women’s PTG following pregnancy loss.

Statement of the Problem

The stigma associated with pregnancy loss may be a factor impacting individuals’ ability to access a supportive social network and experience positive adjustment following loss. In the U.S., pregnancy loss may not be perceived to be as painful or significant as other deaths (Lang et al., 2011; Markin & Zilcha-Mano, 2018) and therefore may not be met with the same social recognition (Burden et al., 2016). This lack of acknowledgment of the loss combined with a lack of clear or customary mourning rituals associated with perinatal loss may make it especially challenging for women to express their grief in socially and culturally meaningful ways (Lang et al., 2011; Markin & Zilcha-Mano, 2018; Rowlands & Lee, 2010). Women who communicate their grief
may be met with denial or intellectualization of their experiences which may discourage them from further disclosure of experiences associated with their loss (Bellhouse et al., 2018; Meyer, 2016). Negative social interactions that increase individuals' senses of isolation can decrease their feelings of control and self-esteem and hence contribute to negative post-loss adjustment (Cohen, 2004). Indeed, the literature suggests that following pregnancy loss, the negative social support that women experience can be detrimental to their immediate affectivity as well as long-term mental health outcomes (deMontiginy, 2017).

On the other hand, there is evidence available indicating that some women do experience positive social support following pregnancy loss. Such support primarily comes from individuals who have also experienced pregnancy loss either in face-to-face or online settings (Gold et al., 2012; Rowlands & Lee, 2010). It has been theorized that getting advice and guidance from others who have shared similar experiences can help individuals understand and know how to act and behave in their new reality (Cohen, 2004). Moreover, it has been suggested that positive responses that validate women's experiences can help women consolidate their traumatic memories and responses leading to more positive adjustment (Lepore, 2001). However, factors and mechanisms through which social support can impact individuals' positive post-loss sequelae have been vastly unexplored in the literature. To date there is only one known study that has explored the relationship between specific aspects of social support, such as prosocial behavior, and PTG in women who have experienced stillbirth (Cacciarelli et al., 2018). More research is needed to provide support for applying the PTG model to understand women’s experiences following pregnancy loss.
Significance of the Study

There has been growing recognition that focusing solely on the negative impact of adverse events does not provide a complete clinical picture of an individual's responses to trauma (Krosch & Shakespeare-Finch, 2017). Factors and mechanisms through which social support act to facilitate the development of a higher level of functioning need to be explored in women who have experienced pregnancy loss. Exploring these relationships can expand our understanding of the applicability of the PTG model to stigmatized bereavement and traumatic events. Investigating how positive psychological change post-trauma occurs in women who have experienced pregnancy loss can increase clinicians’ understanding of how to foster women’s adaptive functioning after such loss.

Specifically, this dissertation expands our understanding of the relationship between interpersonal and intrapersonal factors that can contribute to women’s experiences of growth following pregnancy loss. The first manuscript explored how women’s attachment security is related to their ability to utilize their partner as a support and their experience of growth. A growing body of literature shows that attachment style, relationship quality, and social support are important factors contributing to greater PTG (e.g., Levi-Belz & Lev-Ari, 2019; Prati & Pietrantoni, 2009; Schmidt et al., 2019). Available literature suggests that having partner support can provide a foundation for PTG and may be crucial in bereaved individuals’ positive post-loss adjustment. Specifically, in the context of bereaved women, dyadic coping was proposed to be a key interpersonal factor associated with PTG (Albuquerque et al., 2018). To date, there are no studies that have investigated the relationship between attachment style, dyadic coping and PTG in individuals’ who have experienced pregnancy loss. Therefore, the purpose of
the first manuscript is to address this gap in the current literature and investigate the relationship between an individual's attachment security, perceptions of dyadic coping and PTG following pregnancy loss. As couples who have experienced miscarriage or stillbirth are at increased risk of ending their relationship compared to couples who have experienced a live birth (Gold et al., 2010), it is important to understand risk and protective factors related to survival of the relationship.

The second manuscript focuses on another aspect of PTG theory related to self-disclosure and rumination. PTG theory suggests that the act of disclosing about the traumatic loss can help people reflect, make sense of what happened, accept the reality of their experience and gain insight (Tedeschi et al., 2018). In other words, self-disclosure about the trauma may facilitate deliberate cognitive processing that results in PTG. For example, in a study conducted with those who had lost a friend or family member to suicide, self-disclosure positively contributed to PTG levels (Levi-Belz, 2019). However, the role of social support and self-disclosure are unexplored in women who have experienced miscarriage, a stigmatized event that may not be openly discussed in the individual’s social circles (Bellhouse et al., 2018; Markin & Zilcha-Mano, 2018). The second manuscript will address this gap in the current literature by investigating the relationship between self-disclosure, positive social reactions to self-disclosure, and PTG as partially mediated by rumination. Such findings can be invaluable for counselors and may provide guidance on how to help clients navigate the decision-making process of appropriate self-disclosure.

Finally, the third manuscript can expand on our understanding of the appropriateness of including prosocial behavior in the PTG model. Available research
indicates that bereaved women may engage in prosocial behavior as a way to combat negative social support experiences they had post-loss and that such behavior is associated with increased levels of PTG (Cacciato et al., 2018). It is theorized that PTG may make individuals behave in more prosocial ways because individuals who experience PTG are more likely to empathize with others (Tedeschi et al., 1998). Indeed, previous studies have indicated that empathy mediates the relationship between PTG and prosocial behaviors (El-Gabalawy, 2010). However, such a relationship has not been tested in individuals’ who have experienced pregnancy loss. Furthering our understanding of the mechanisms behind helping others after a period of trauma is crucial in finding ways to promote such behavior and its positive impact on an individual’s post-loss adjustment.

On a broader advocacy level, this dissertation may aid the continued efforts to break the stigma associated with pregnancy loss. These studies may increase researchers’, clinicians’ and the general public’s understanding of the impact that providing women with space to disclose their feelings and engage in supportive communities has on their psychological well-being.

**Theoretical Foundation**

The main theoretical framework used in this dissertation is the theory of PTG developed by Tedeschi and Calhoun (1996, 2004). PTG theory conceptualizes growth as a long-term, transformative change that individuals experience after a traumatic event in five domains: “greater appreciation of life and changed sense of priorities; warmer more intimate relationships with others; a greater sense of personal strength; recognition of new possibilities or paths for one’s life; and spiritual development” (Tedeshi & Calhoun,
The PTG model was developed from theories of change that emphasized the need to reconstruct one’s beliefs about the world after they have been shattered by a very challenging event that one was unprepared for (Janoff-Bulman, 1992). The challenge to an individuals' core beliefs evokes an internal struggle between a person’s previous assumptions about the world and new insight gained following a traumatic event. The discrepancy between an individual’s mental model of oneself or the world and the meaning inherent in trauma can initiate negative cognitive processes (Lepore, 2001). One example of cognitive process initiated by a challenge to core beliefs and emotional distress is repetitive thoughts known as rumination. Immediately after the event, individuals tend to engage in an intrusive type of rumination which is characterized as uncontrolled, invasive thoughts and images (Cann et al., 2011). Understanding the events and their implications requires more conscious, effortful cognitive work which can be accomplished by engaging in deliberate rumination (Tedeschi et al., 2018). Deliberate ruminations are more reflective and intentional (Martin & Tesser, 1996) and allow a person to make meaning, adapt to the changed circumstances of life and develop a revised core belief structure that accounts for them, which is a crucial aspect of PTG theory. Through these cognitive processes, individuals seek to integrate traumatic experiences into their life narrative.

The PTG model suggests that social support can play a significant role in positive adjustment following a traumatic event and can influence the PTG process and outcome in many ways. First, having a strong social support network pre-trauma is likely to help people cope effectively with a traumatic event. Even though it may not directly increase PTG, it can affect the PTG process (Tedeschi et al., 2018). Second, social support can act
as a mediator between individual difference variables and PTG (Tedeschi et al., 2018). Having someone who can provide constructive support may assist in the development of new schemas (Tedeschi et al., 2018). When people engage in automatic intrusive rumination, sharing these thoughts with someone they trust may help them look at things in a different and more hopeful and adaptive way. The listeners may be able to offer different perspectives or serve as role models, especially if they have experienced a similar event (Tedeschi et al., 2018).

Finally, the relationship between social support and PTG can be seen as an outcome (Tedeschi et al., 2018). After experiencing a major life crisis, a person may get involved and support others through a newly found sense of compassion (Shakespeare-Finch & Copping, 2006). Social support can help to develop a stronger sense of connectedness to others, which in turn can be interpreted as an example of PTG (Tedeschi et al., 2018). For instance, people who receive emotional or instrumental support from others may also use the opportunity to reflect on their own experiences and may even share them with yet another person whom they will support (Tedeschi et al., 2018). This mutuality may foster a deeper understanding of self, relationships, and life in general.

**PTG and Pregnancy Loss**

Despite the rise in research investigating the relationship between trauma and PTG, few studies have considered the extent to which positive transformation occurs following pregnancy loss. A study by Krosh and Shakespeare-Finch (2017) focused on quantitatively exploring the extent to which pregnancy loss can act as an impetus for PTG in the context of other psychological outcomes such as perinatal grief and posttraumatic
stress and assessing the role of core belief disruption in those outcomes. The study participants were women \((n = 328)\) who experienced either miscarriage or stillbirth. The researchers reported moderately high mean scores on the core belief challenge inventory, suggesting that on average women’s core understanding of the world was shattered by pregnancy loss. The studies sample of women also reported moderate levels of PTG post-loss. The regression analysis findings indicated that core belief challenge was related to PTG \((\text{Krosch} \& \text{Shakespeare-Finch}, 2017)\) providing correlational support for the theory of PTG and its application to women who have experienced miscarriage or stillbirth.

Freedle and Kashubeck-West (2020), further explored the relationship between core belief challenge and PTG as well as the role rumination plays in this relationship among women \((n = 476)\) who experienced either miscarriage or stillbirth. The study’s results replicated Krosch and Shakespeare-Finch’s (2017) findings that women can experience moderate levels of PTG following pregnancy loss and that core belief challenge was related to PTG. Freedle and Kashubeck-West found elevated mean scores on rumination scales indicating that women reported engaging in high levels of rumination immediately after pregnancy loss. Deliberate, but not intrusive, rumination mediated the relationship between core belief challenge and PTG which was consistent with PTG theory \((\text{Freedle} \& \text{Kashubeck-West}, 2020)\). The study expanded the understanding of how pregnancy loss impacts women’s perceptions of the world and how reflective, repetitive thinking can facilitate women’s experiences of psychological growth through the restoration of core beliefs.

A study by Lafarge and colleagues (2019) explored the relationships between rumination, grief and PTG. The study participants were women \((n = 161)\) who terminated
their pregnancy due to a fatal fetal abnormality between 11 and 34 weeks of gestation. The researchers found that following termination for fetal abnormality the mean scores on the rumination scale were above the midpoint of 1.5 (2.05 for intrusive rumination and 1.93 for deliberate rumination) indicating elevated levels of rumination in the sample of women. The type of rumination differentially predicted women’s adjustment, with intrusive rumination predicting grief and deliberate rumination predicting PTG. Further analysis showed that deliberate rumination mediated the relationship between grief and PTG. The researchers concluded that deliberate rumination facilitates the PTG experience. The study’s findings added to the limited literature, indicating that psychological growth can be an outcome of perinatal loss and that engaging in reflective, meaning-oriented thinking is beneficial to women following termination for fetal abnormality (Lafarge et al., 2019). However, the mechanisms for that change in repetitive thoughts, including the role of various types of social support, are still under-researched in this population.

To date, only one study has investigated the relationship between prosocial support and PTG in women who have experienced pregnancy loss (Cacciatore et al., 2018). Cacciatore and colleagues’ mixed-methods study sought to explore the importance of volunteering following stillbirth in women’s experiences of PTG (n = 191). Additionally, qualitative analysis was conducted on women who volunteered after but not before their loss to further explore their reasons for volunteering (n = 39). Quantitative findings indicated that women who volunteered after the death of their baby reported higher levels of PTG compared to those who did not. Qualitative analysis showed that women engaged in volunteering to help others who were going through this experience
and “decrease the suffering of other bereaved parents” (Cacciare et al., 2018, p. 32).

The researchers concluded that engaging in volunteer work “fostered meaning-construal and positively relate to self-reported PTG” following stillbirth (Cacciare et al., 2018, p.33). Given the results thus far, further investigation of the interplay between aspects of social support, rumination, and PTG in the area of perinatal loss is warranted. Therefore, this dissertation adds to the growing literature regarding women’s experiences following pregnancy loss by investigating the relationship between social support factors and the positive psychological change women experience following pregnancy loss.

**Conclusion**

The dissertation aims to address the current gap in the literature related to women’s experiences of positive psychological changes following pregnancy loss. Specifically, there is a paucity of studies investigating the relationship between social support factors and levels of PTG in the aftermath of the highly stigmatized event that is miscarriage or stillbirth. This section outlined the problem and its significance, the theoretical approach to be utilized, as well as the available literature related to pregnancy loss and PTG. The next section will discuss the research hypotheses, participants, measures, procedures and the data analysis.
Section 2

Methods

The dissertation utilized a quantitative, correlational design to explore the relationship between factors associated with social support and PTG in women who have experienced either miscarriage or stillbirth. Specifically, the following factors were investigated in relation to PTG: 1) Adult attachment and women’s experiences of dyadic coping; 2) self-disclosure, positive social reactions to disclosure, and deliberate rumination; 3) empathy and prosocial behaviors. This section will outline the hypotheses for each manuscript, sampling methods, procedures, a brief outline of measures and the data analysis plan. More in-depth explanations of the measures and data analysis plan will be discussed in section three.

Hypotheses

Manuscript 1

Hypothesis 1: Attachment security will be a positive significant predictor of PTG when loss context factors are controlled for.

Hypothesis 2: The relationship between attachment security and PTG will be mediated by forms of dyadic coping (positive, supportive, delegated and stress communication).

Manuscript 2

Hypothesis 1: Self-disclosure will be a significant positive predictor of deliberate rumination and PTG when loss context factors are controlled for.

Hypothesis 2: Deliberate rumination will mediate the relationship between self-disclosure and PTG.
Hypothesis 3: Positive social reactions to disclosure will moderate the indirect path (via deliberate rumination) and direct path from self-disclosure to PTG.

   a) For the moderated indirect effect, it is hypothesized that the association between self-disclosure and PTG through deliberate rumination will be stronger for women who report higher rates of positive social reaction than for those who report lower rates of positive social reactions following a disclosure of pregnancy loss.

   b) For the moderated direct effect, it is hypothesized that the association between self-disclosure and PTG will be stronger for women who report higher rates of positive social reaction than for those who report lower rates of positive social reactions following a disclosure of pregnancy loss.

Manuscript 3

Hypothesis 1: Women who engage in prosocial behavior following pregnancy loss will show higher levels of empathy and PTG compared to those who do not.

Hypothesis 2: The relationship between PTG and prosocial behavior will be mediated by empathy.

Methodology

Participants

Participants were women who have physically carried a pregnancy that resulted in either miscarriage, loss of a pregnancy before 20 weeks gestation, (March of Dimes, 2020a) or stillbirth, baby born without signs of life after 20 weeks gestation (March of Dimes, 2020b). To be eligible to participate, individuals had to be over 18 years old.
Additional inclusion and exclusion criteria were placed for each manuscript. In the first manuscript, only women who reported that they were in a committed romantic relationship at the time of conception and pregnancy loss were included in the final sample. In the second manuscript, only women who experienced miscarriage were included in the final sample. Based on different inclusion criteria the sample for each study had a slightly different demographic composite. Detail description of each sample will be discussed in section three.

**Measures**

Demographic information was collected including current age, ethnicity, educational level, employment status, current income, and relationship status. Loss context factors were assessed and included the type of loss(es), number of pregnancy losses, time since the loss(es), gestational age(s) of the baby or fetus at the time of loss(es), and whether participants have had living children. Participants were asked to rate the severity of their pregnancy loss experience from 0 (*not traumatic*) to 9 (*very severely traumatic*) based on a definition of a traumatic event (which was provided). This definition was consistent with the conceptualization of trauma in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) (APA, 2013). This question has been previously used in trauma research to control for trauma severity (e.g., Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). Perceived personhood related to pregnancy was assessed by a 10-point Likert-type scale (0 *not at all* to 9 *very great degree*) indicating the degree to which participants believed their baby or pregnancy was a person (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017).
Participants were asked to complete seven measures that have shown good psychometric properties and have been used with samples of traumatized or bereaved individuals. These measures include: 1) *The Posttraumatic Growth Inventory* (PTGI; Tedeschi & Calhoun, 1996), which measures positive changes that may be experienced in the aftermath of trauma. Participants were asked to rate the occurrence of personal changes that have arisen pursuant to their loss; 2) *The Event-Related Rumination Inventory* (ERRI; Cann et al., 2011), which is designed to assess rumination in relation to a specified life event. Participants were asked to report their predominante rumination style (deliberate or intrusive) over the last few weeks; 3) *The Experiences in Close Relationships Scale-Short Form* (ECR-S; Brennan et al., 1998; Wei et al., 2007), which measures women’s adult attachment security; 4) *The Dyadic Coping Inventory* (DCI; Bodenmann, 2008), which assesses women’s stress communication and dyadic coping, their perceptions of their partner’s coping, and their perceptions of how they coped as a couple; 5) *The Distress Disclosure Index* (DDI; Kahn & Hessling, 2001) assesses women’s tendencies to conceal versus disclose personally distressing information; this scale was only completed by women who reported that they have experienced miscarriage and not stillbirth; 6) *The Social Reactions Questionnaire* (SRQ; Ullman, 2000) was used to measure participants’ perceptions of positive reactions to disclosure. For the purpose of this dissertation only the emotional support subscale and the tangible aid/instrumental support subscale was used; 7) *The Interpersonal Reactivity Inventory* (IRI; Davis, 1983) was used to measure empathy.

Additionally, prosocial behavior was assessed via nine questions designed specifically for this study. Prosocial behavior was defined as either volunteering in any
in-person capacity or posting content online that was meant to benefit women who have experienced pregnancy loss. Women were asked about the type of volunteering they engage in, its duration and frequency. Prior research has assessed volunteering in a similar way (e.g., El-Gabalawy, 2010).

**Procedures**

There was one wave of data collection. Participants were recruited using convenience and snowball sampling methods. The recruitment strategy included advertising and posting the invitation to participate in the study on social media (i.e., Facebook, Instagram and Twitter) and online websites (e.g., Reddit). Participants who self-identify with the inclusion criteria were asked to complete a self-report online survey designed using Qualtrics, an online survey program.

All procedures were reviewed and approved by the University of Missouri-St. Louis Institutional Review Board prior to data collection. As part of the informed consent process, participants were told that they were participating in a study to see how the social support they have received following pregnancy loss has impacted their ability to identify any positive personal changes that have taken place since their loss. Participants who decided to participate completed the consent form online. The survey took each participant approximately 20-30 minutes to complete (approx. 170 questions). Responses to the survey were kept confidential and participants were not asked for any identifying information beyond demographic questions. Once participants completed the survey, the goals of the study were reiterated, and a list of mental health resources was made available in case the survey questions made an emotional impact on the participants. Additionally, upon completion of the survey, participants were asked if they would like
to enter a drawing to receive a gift card. If a participant decided to take part in the
drawing, they were redirected to a separate survey which asked them for their name and
preferred method of contact. This survey was not linked in any way with participants’
previous responses and appeared whether or not participants answer all of the questions.
The gift cards winners were contacted individually by the researcher.

**Data Analysis**

Prior to conducting the analyses, the data was screened for the assumptions of
regression and analysis of variance. Additional information on each study analysis will be
discussed in section three.

*Manuscript 1*

The first hypothesis was tested using a hierarchical regression analysis. The PTGI
score (Tedeschi & Calhoun, 1996) was entered as an outcome variable. In the first step of
the regression analysis control variables such as type of loss, gestation, perceived
personhood, trauma, time since first and last loss and demographic variables that were
correlated with the main study variables such as sexual orientation and social class were
entered. In the second step of the regression analysis, attachment anxiety and attachment
avoidance were entered to test the unique contribution of attachment to PTG when
demographic and loss context factors were controlled for. In the third step, forms of
dyadic coping (supportive, delegated, negative, joint and stress communication) by
oneself and perceived from one’s partner were entered to test whether the women’s
experience of dyadic coping following pregnancy loss was a significant predictor of
growth and whether attachment avoidance and attachment anxiety will remain significant
predictors of PTG after accounting for dyadic coping.
The second hypothesis, that dyadic coping will mediate the relationship between attachment and PTG, was tested using mediation analysis. Hayes’s (2014) PROCESS macro for SPSS (version 25) was employed to estimate the path coefficients in the mediation models. In the first model, the attachment anxiety subscale of the ECR-S (Brennan et al., 1998; Wei et al., 2007), was entered as a predictor, participants’ total score on the DCI (Bodenmann, 2008) was entered as mediator and PTGI total score (Tedeschi & Calhoun, 1996) was entered as the outcome variable. In the second model, the attachment avoidance subscale of the ECR-S (Brennan et al., 1998; Wei et al., 2007), was entered as a predictor, participants’ total score on the DCI (Bodenmann, 2008) was entered as mediator and PTGI total score was entered as the outcome variable. In both analysis, variables that showed significant associations with DCI were entered as covariates to rule out the possibility of these factors accounting for the hypothesized effect (Lafarge et al., 2019).

**Manuscript 2**

The first hypothesis that self-disclosure will be a positive significant predictor of deliberate rumination and PTG when loss context factors are controlled for were tested using two hierarchical regression analyses. In the first analysis, PTGI score (Tedeschi & Calhoun, 1996) was entered as the outcome variable. In the first step of the regression analysis control variables that were correlated with the outcome variables such as the time since the loss(es), perceived personhood and severity of trauma were entered into the model. In the second step of the regression analysis the DDI score (Kahn & Hessling, 2001) was entered to test the unique contribution of self-disclosure to PTG when demographic and loss context factors were controlled for. In the second analysis, the
deliberate rumination (Cann et al., 2011) score was entered as an outcome variable. In the first step of the regression analysis control variables that were correlated with the outcome variables such as the time since the loss(es), perceived personhood and severity of trauma were entered into the model. In the second step of the regression analysis the DDI score (Kahn & Hessling, 2001) was entered to test the unique contribution of self-disclosure to deliberate rumination when demographic and loss context factors were controlled for.

The second hypothesis that deliberate rumination will mediate the relationship between self-disclosure and PTG was tested using mediation analysis. Hayes’s (2014) PROCESS macro for SPSS was employed to estimate the path coefficients in the mediation model. The DDI score (Kahn & Hessling, 2001) was entered as a predictor, deliberate rumination (Cann et al., 2011) was entered as a mediator and PTGI total score (Tedeschi & Calhoun, 1996) was entered as the outcome variable. Variables that show significant associations with deliberate rumination were entered as covariates to rule out the possibility of these factors accounting for the hypothesized effect (Lafarge et al., 2019).

The third hypothesis was tested using moderated mediation PROCESS macro (Hayes, 2013). The conceptual model and statistical template of Model 8 fit best with the third hypothesis and was therefore selected for the moderated mediation analysis.

**Manuscript 3**

The first hypothesis regarding engagement in prosocial behavior and empathy/PTG will be tested using analysis of variance. One-way ANCOVAs and one-way ANOVA was conducted. Participants were divided into two groups: individuals who
have reported volunteering following pregnancy loss and those who have not. Participants were also divided into those who volunteered only in person versus in person and online. The dependent variable in the first analysis was the score on the empathy scale (IRI; Davis, 1983) and the dependent variable in the second analysis was PTGI total score (Tedeschi & Calhoun, 1996). Demographic and loss context factors that are correlated with the dependent variables were entered as covariates.

The second hypothesis that the relationship between PTG and prosocial behavior will be mediated by empathy was tested using mediation analysis. Mediation analysis was used to investigate whether empathy mediates the relationship between prosocial behaviors and PTG. Hayes’s (2014) PROCESS macro for SPSS was employed to estimate the path coefficients in the mediation model. PTGI total score (Tedeschi & Calhoun, 1996) was entered as the predictor, IRI score (Davis, 1983) was entered as the mediator and prosocial behaviors was entered as the outcome variable. Variables that show significant associations with empathy was entered as covariates to rule out the possibility of these factors accounting for the hypothesized effect (Lafarge et al., 2019).

Conclusion

This dissertation aims to contribute to the perinatal loss literature by investigating the relationship between factors associated with social support and PTG. This section outlined the proposed methods that were used to conduct the study. The participants, measures, procedures, and analyses were discussed. The next section will consist of three proposed manuscripts. Each manuscript will include literature review, methods, results and discussion section.
Section 3

Manuscript 1

Interpersonal and Intrapersonal Factors Contributing to Women’s Posttraumatic Growth Following Pregnancy Loss

Losing a pregnancy through miscarriage or stillbirth can be a devastating and traumatic experience for women. It is estimated that 10 to 15 percent of recognized pregnancies result in miscarriage (March of Dimes, 2020a) and 1 in 100 pregnancies will result in stillbirth (March of Dimes, 2020b). Given the high prevalence of pregnancy loss in the U.S., many couples are impacted by it every year. Research indicates that pregnancy loss can place a substantial strain and result in the dissolution of a relationship (Gold et al., 2010). Partners may find themselves in conflict over coping styles and struggle to communicate during this stressful time (Jaffe & Diamond, 2011). On the other hand, the loss can bring partners together through enhanced feelings of closeness and can positively impact both partners’ post-loss adjustment (Albuquerque et al., 2016; Albuquerque et al., 2018). Given the potential for negative relational outcomes, it is important to investigate factors that can contribute to a couple's growth following a highly stressful and life-altering loss such as a miscarriage or stillbirth.

Based on the theory of posttraumatic growth (PTG; Calhoun & Tedeschi, 2006), growth takes place when individuals reevaluate their previous beliefs and assumptions about the world to integrate a traumatic event. The theory suggests that pre-trauma, as well as post-loss, interpersonal and intrapersonal factors can impact an individual's levels of PTG following a traumatic event (Tedeschi et al., 2018). A growing body of literature provides support for the theory and suggests that attachment style, relationship quality,
and social support are important factors contributing to greater PTG (e.g. Levi-Belz & Lev-Ari, 2019; Prati & Pietrantoni, 2009; Schmidt et al., 2019). However, the specific mechanisms contributing to individuals’ positive adjustment following pregnancy loss continue to be vastly unexplored. The current study aims to explore the relationship between pre-trauma intrapersonal factors such as women’s attachment security and post-loss interpersonal factors such as dyadic coping and their relationship with PTG following miscarriage or stillbirth.

**Pregnancy Loss and Partner Support**

Pregnancy loss continues to be identified in the scientific and popular literature as a stigmatized, complex and misunderstood type of loss that may impact individuals’ experiences of social support. Community members may not understand that women can experience intense feelings of grief as well as other negative mental health outcomes following the loss of a pregnancy and hence may not offer support that is socially sanctioned after other deaths (Bellhouse et al., 2018; Cacciatore, 2010). In cases of miscarriage, partners who have not shared the existence of their pregnancy may be the only ones who know that loss took place and may opt to cope in secrecy (Bellhouse et al., 2018). Therefore, it is not surprising that partner support is crucial in post-loss adjustment.

Research indicates that women perceive their partners as central support figures following a perinatal loss. In a mixed method, cross-sectional study Bellhouse and colleagues (2018) reported that “most women in the sample described their husbands as being emotionally and physically present” (p. 3) following miscarriage. The authors did not provide the percentage of the sample who identified with this statement. Other
FREEDLE, A. DISSERTATION

qualitative studies also suggested that husbands’ support may play an important role in women’s post loss adjustment. Specifically, women whose husbands provided encouragement and support following miscarriage reported that such behaviors helped them change their negative thoughts and allowed them to have a more positive perspective (Abboud & Liamputtong, 2005; Rowlands & Lee, 2010). On the other hand, few women reported that they felt that their partner “did not fully understand the impact the miscarriage had on them” (Bellhouse et al., 2018, p.4) and therefore were not fully available to provide the needed support.

**Posttraumatic Growth Theory**

The term posttraumatic growth was coined by Tedeschi and Calhoun (1996) to reflect the positive psychological change individuals can experience in five domains: “greater appreciation of life and changed sense of priorities; warmer more intimate relationships with others; a greater sense of personal strength; recognition of new possibilities or paths for one’s life; and spiritual development” (Tedeschi & Calhoun, 2004, p.6). Since then, there has been increased research interest in the experience of growth in the aftermath of trauma. Based on the PTG theory, the foundation for growth is an event that shatters an individual's core beliefs. Tedeschi & Calhoun (2004) explains that “it is the individual's struggle with the new reality in the aftermath of trauma that is crucial in determining the extent to which posttraumatic growth occurs” (p.4). Therefore, it is not necessarily how stressful the event is, but rather the challenge to one's world assumptions that is crucial in facilitating growth (Cann et al., 2010). Challenges to core beliefs and emotional distress initiate intrusive ruminative thoughts. In cases of death, when the loss is consistent with a person's assumptive beliefs, individuals can use their
beliefs and support networks to lessen their emotional distress and return to a state of well-being with relatively little cognitive work. However, as children are not expected to die before parents, bereaved women may need to engage in extensive cognitive processing before growth can occur (Lafarge et al., 2019). As the individual works through the psychological distress and engages in a more deliberate, reflective type of rumination, PTG can occur (Tedeschi et al., 2018). There are multiple intrapersonal as well as interpersonal factors that can be associated with this cognitive process and an individual's ability to integrate the traumatic event into their life narrative (Tedeschi et al., 2018).

**Intrapersonal Factors**

It has been theorized that a strong social support network pre-trauma is likely to help people cope effectively with a traumatic event and affect the PTG process (Tedeschi et al., 2018). An individual's ability to create and maintain healthy relationships with others is thought to be based on their attachment style. According to attachment theory, an individual's early caregiving experiences contribute to the development of internal working models, a set of beliefs and expectations regarding caregiver accessibility and responsiveness as well as the belief about one's deservingness of such care (Bowlby, 1982). Through experiences with an attachment figure the child develops expectations about the world and others which continues to be represented in their attachment patterns as adults (Bowlby, 1982). Therefore, the way adults interpret and understand their social environment stems from their early childhood relationship with their primary caregiver (Bowlby, 1982; Hazan & Shaver, 1987). Assessing the security of working models is crucial for understanding interpersonal relationships. When stressful or threatening events
activate the attachment system, individuals differ in how they cope with the distress based on the distinctive characteristics of their internal working models (Bowlby, 1982).

Hazan and Shaver (1987) have been pioneers in the development of adult attachment style theory and defined three attachment types in adults: secure, avoidant, and anxious-resistant. Individuals that are securely attached expect that their partners will take their concerns seriously and provide loving support. When distressed, such individuals will seek out support and find comfort in the availability of a significant other. Secure individuals are thought to be able to address a stressful and threatening situation in a way that promotes its resolution (Bartholomew & Horowitz, 1991). On the other hand, anxiously attached individuals demonstrate uncertainty regarding the availability of their intimate partners (Fraley & Shaver, 1998). Insecurely attached individuals are likely to worry that significant others may leave them during times of adversity. Lastly, avoidantly attached individuals do not sense a strong need for intimate relationships and strive to maintain an emotional distance from significant others (Fraley & Shaver, 1998). Avoidantly attached individuals rely on self-regulatory behaviors rather than social support to minimize distress (Ein-Dor et al., 2010). Overall, anxiously and avoidant-resistant attachment styles share the perception that their partners will be less supportive and less able to meet personal emotional needs.

In terms of measuring adult attachment, more recent studies indicated that it should be conceptualized as consisting of two dimensions: anxiety, which assesses the degree to which individuals fear rejection and abandonment by significant others and avoidance which assesses the degree to which individuals fear intimacy and being interdependent with others (Fraley et al., 1998). Individuals are categorized as having a
secure adult attachment orientation if they indicate low levels of attachment anxiety and avoidance and as insecure if they have high levels of attachment anxiety or avoidance (Wei et al., 2007).

Despite extensive literature focused on adult attachment, research investigating the relationship between attachment security and PTG continues to be scarce. Available research shows that adult attachment plays an important role in facilitating PTG. A recent study by Levi-Belz and Lev-Ari (2019) indicated that securely attached suicide loss survivors reported higher levels of PTG compared to those who were insecurely attached. Security of attachment was also differentially related to PTG. Secure attachment was positively related to PTG, and avoidant attachment was negatively related to PTG (Levi-Belz & Lev-Ari, 2019). Similarly, a study by Avila and colleagues (2016) indicated that the partner's attachment security supported the individual's positive adjustment to life after breast cancer (Avila et al., 2016). Researchers concluded that having a securely attached partner relationship can provide resources for an individual’s PTG beyond those available to the individual (Avila et al., 2016). To date, there are no studies that have investigated the relationship between adult attachment style and PTG in individuals who have experienced pregnancy loss.

**Interpersonal Factors**

Interpersonal processes can also be related to individuals' experience of PTG. Having someone who can provide constructive support may assist in the development of new schemas (Tedeschi et al., 2018). When people engage in automatic intrusive rumination, sharing these thoughts with someone they trust may help them look at things in a different and more hopeful and adaptive way. The listeners may be able to offer
different perspectives, especially if they have experienced a similar event (Tedeschi et al., 2018). The literature suggests that partner support can act as a foundation for PTG and could be important factor in bereaved women’s positive post-loss adjustment.

Albuquerque and colleagues (2018) have suggested that in the context of bereaved women, dyadic coping (DC) may be a crucial interpersonal factor associated with PTG. DC can be described as an interpersonal process in which one partner’s supportive response has a regulatory effect on the other partner’s communicated distress (Bodenmann, 2005). Mutual understanding to cope with the shared stressor associated with DC is an important factor contributing to individual adjustment as well as relationship quality and stability (Bodenmann & Cina, 2006). Given the social stigma associated with pregnancy loss, partner’s ability to mutually support each other after such loss may be particularly important for their positive adjustment. However, there is limited empirical support available for this theory for individuals who have experienced pregnancy loss specifically. In a study with a sample of bereaved parents where 27.4% of deaths in the sample included fetal death, forms of DC were significantly associated with PTG (Albuquerque et al., 2018). Since this was the first study investigating the relationship between DC and PTG, further research is needed to clarify this relationship.

Current Study

Research suggests that attachment style can influence an individual's perception of the social environment, which impacts how individuals utilize social support (Collins & Feeney, 2004). Researchers found anxious and avoidant attachment to be negatively associated with higher dyadic coping while lower dyadic coping has been found to be associated with worse social and functional well-being (Crangle et al., 2019; Fuenfhausen
& Cashwell, 2013). However, the relationship between attachment, dyadic coping and positive adjustment following pregnancy loss is vastly unexplored. Therefore, the purpose of the current study is to address this gap in the literature and investigate the relationship between adult attachment, dyadic coping and PTG following pregnancy loss. This study poses the following hypotheses: 1) attachment security will be a positive significant predictor of PTG when loss context factors are controlled for; 2) the relationship between attachment security and PTG will be mediated by forms of dyadic coping (supportive, delegated and stress communication).

Methods

Participants

The final sample was comprised of women \((n = 244)\) who experienced either miscarriage defined as loss of a pregnancy before 20 weeks gestation \((n = 196, 80.3\%)\), stillbirth defined as baby born without signs of life after 20 weeks gestation \((n = 21, 8.6\%)\), or both miscarriage and stillbirth \((n = 27, 11.1\%)\). Participants were predominately White \((n = 201; 82.4\%)\), middle class \((n = 122, 50\%)\), heterosexual \((n = 214, 87.7\%)\), well educated (bachelor’s degree or higher \(n = 148, 60.5\%)\), and employed on a full-time basis \((n = 131, 53.7\%)\). The mean age of the participants was 32.59 years \((SD = 6.85, \text{ range } 19-58)\).

The sample was split between women who have experienced single versus multiple pregnancy losses \((n = 122, 50\%)\). Participants reported experiencing up to 9 pregnancy losses with a mean of 2.12 \((SD = 1.59)\) losses. The most recent pregnancy loss occurred on average 3.33 \((SD = 4.23)\) years ago, with timing of loss ranging from less than a month ago to 25 years ago, and the mean number of gestation weeks at the time of the
first loss was 11.71 (SD = 8.11). A small percentage of all reported pregnancy losses were associated with fertility treatment (n = 26, 10.7%). The majority of the sample reported that they had living children (n = 174, 71.6%) and the timing of loss was split between having the loss before living children (n = 68, 27.9%), after (n = 55, 22.5%) or both (n = 51, 20.9%).

**Procedure**

Participants were recruited using convenience and snowball sampling methods. The recruitment strategy included creating an advertisement that ran on two social media platforms (e.g. Facebook and Instagram). The ad was set to target women aged 18 to 45, meaning that the information about the study was shown to all Facebook or Instagram women who fit that demographic. The invitation to participate in the study was also posted on the researcher’s social media accounts as well as online websites (e.g., Reddit). From the researcher’s social media account, the invitation was shared 15 times. Further shares were not tracked.

To be eligible to participate, individuals had to be over 18 years old, experienced pregnancy loss defined as either miscarriage (loss of a pregnancy before 20 weeks gestation) or stillbirth (baby born without signs of life after 20 weeks gestation), and had to be in a committed romantic relationship at the time of conception and pregnancy loss.

Participants who self-identified with the eligibility criteria and clicked the continue button signifying their consent to participate in the study where asked to complete an online survey. At the end of the survey the study purpose was reiterated and a list of mental health resources and supports available was provided in case the survey questions were emotionally disturbing. Additionally, upon completion of the survey,
participants were asked if they would like to enter a drawing to receive a gift card. This survey was not linked in any way with participants’ previous responses and appeared whether or not participants answered all of the questions. The gift card winners were contacted individually by the researcher. Participation was voluntary and confidential. The study was approved by University of Missouri-St. Louis Institutional Review Board.

Initially, 464 participants started the online survey; 276 people completed the survey. The 40.5% dropout rate included 48 participants who opened the survey but did not answer any questions, two participants who did not consent to take part in the survey and three participants who did not meet the eligibility criteria and were automatically removed from the survey by Qualtrics. The remaining drop out \((n = 135)\) was likely due to the survey length. Two participants were excluded from the analysis for reporting that they were born male, two for being from outside of the U.S., six for reporting their pregnancy loss was not a traumatic event (score of 0), and 13 for not being in a romantic committed relationship at the time of conception and pregnancy loss. An additional six participants were excluded for being univariate outliers defined as those scoring more than 3.29 standard deviations from the mean on the main study variables; and three for being multivariate outlier, as Mahalanobis distance score was higher than the critical value of 23.21.

**Measures**

*Demographic Questionnaire and Loss Context Factors*

Demographic information collected included current age, ethnicity, educational level, employment status, current income, and relationship status. Loss context factors assessed and included the type of pregnancy loss, number of pregnancy losses, time since
the loss(es), gestational age of the baby or fetus at the time of loss(es), and whether participants have had living children. Participants were asked to rate the severity of their pregnancy loss experience from 0 (*not traumatic*) to 9 (*very severely traumatic*) based on the provided definition of a traumatic event that is consistent with the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) conceptualization of trauma (APA, 2013). This question has been previously used in trauma research to control for trauma severity (e.g., Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017).

The perceived personhood related to pregnancy was assessed by a 10-point Likert-type scale (0 *not at all* to 9 *to a very great degree*) indicating the degree to which participants believe their baby or pregnancy was a person (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017).

**Adult Attachment**

Women’s adult attachment was measured using the Experiences in Close Relationships Scale-Short Form (ECR-S; Brennan et al., 1998; Wei et al., 2007). The ECR-S consists of 12-items scored on a 7-point Likert type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) that measures two dimensions underlying adult attachment. The ECR-S explores how individuals generally experience relationships, not just what is happening in an individual’s current relationship. A six-item subscale assesses dispositional attachment anxiety with sample item including "I worry a fair amount about losing my partner." The ECR-S also includes a six-item subscale assessing dispositional attachment avoidance, a sample item includes "I am uncomfortable when my romantic partner wants to be close." Higher scores on this subscale indicate higher levels of attachment avoidance. The short form of the scale shows similar psychometric
properties to that of the original 36 item scale (Wei et al., 2007). In a sample of undergraduate students, the scale showed acceptable internal consistency ($\alpha = .77$ to $\alpha = .88$), test-retest reliability over one month and construct validity. The scale showed acceptable internal consistency when used with couples who face a stressful event such as ovarian or breast cancer ($\alpha = .70$ to $\alpha = .86$ for anxious attachment and $\alpha = .75$ to $\alpha = .81$ for avoidant attachment; Avila et al., 2017; Crangle et al., 2019). The Cronbach alpha in the current sample was .77 for attachment anxiety and .83 for attachment avoidance.

**Dyadic Coping**

DC was measured using the Dyadic Coping Inventory (DCI; Bodenmann, 2008). The DCI was designed to measure perceived communication and dyadic coping that occurs in close relationships when one or both partners are stressed. DC includes an individual’s attempt to reduce the stress of their partner and a common endeavor between couples to deal with external stress that affects the relationship. The inventory consists of 37-items to be completed individually and measures DC as a multidimensional construct that includes the following subscales: 1) supportive DC, which occurs when one partner provides emotional or instrumental support that assists the other partner in coping; 2) delegated DC, which occurs when one partner takes on responsibilities to reduce the other partner’s stress; 3) negative DC, which includes hostile, ambivalent actions or words that have deleterious intentions; 4) joint DC, which occurs when partners work together to handle the mutual stressor through information seeking, shared feelings, mutual commitment, or joint relaxation; and 5) stress communication which includes the ability to communicate the stressful experience and to request emotional or practical support (Bodenmann, 2005). The items are answered on a five-point scale ranging from 1
(very rarely) to 5 (very often). The mean of the respective items serves as the subscales' total scores. Higher scores on the positive and joint DC subscales and lower scores on the negative DC subscales indicate better DC. The inventory showed adequate reliability and validity (Ledermann et al., 2010). Acceptable internal consistency has been shown in a sample of bereaved parents (α above .70 for all subscales except negative DC by oneself subscale, α = .67; Albuquerque et al., 2018). The Cronbach alpha in the current sample was as follows: .67 for stress communicated by oneself, .58 for supportive dyadic coping by oneself, .82 for delegated dyadic coping by oneself, .72 for stress communication of the partner, .89 for supportive dyadic coping of the partner, .88 for delegated dyadic coping of the partner, .85 for common dyadic coping, and .92 for the total score.

**Posttraumatic Growth**

PTG was measured using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), a 21-item measure of positive changes that may be experienced in the aftermath of trauma. Participants rated the occurrence of personal changes they experienced following their pregnancy loss from 0 (not at all) to 5 (a very great degree). The PTGI yields a total score of posttraumatic growth as well as scores for five dimensions: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. For the purpose of this study, only the PTGI total score was used. The PTGI showed excellent internal consistency in a sample of women who experienced pregnancy loss (α = .92, Krosch & Shakespeare-Finch, 2017), and acceptable test-retest reliability over two months (r = .71; Tedeschi & Calhoun, 1996). Factor analyses confirmed the five-factor structure of the PTGI (Morris et al., 2005). The Cronbach alpha in the current sample was .93 for the total score.
Data Analysis

Descriptive statistics were calculated to investigate levels of posttraumatic growth, adult attachment, and dyadic coping as well as to explore the sample's demographic information. Moreover, bivariate correlations using Pearson's correlation coefficient were conducted to examine whether demographic factors, loss context factors, adult attachment, and dyadic coping were related to PTG. Independent samples t-test was used to compare attachment security between participants who reported to be in the same relationship as opposed to those who have dissolved the relationship since the pregnancy loss.

Before conducting regression and mediation analyses, the data were checked for: univariate outliers using z-scores; multivariate outliers using Mahalanobis Distance; multicollinearity using Pearson’s correlation coefficient; linearity using scatterplot matrices, homoscedasticity, and normally distributed errors using Q-Q plots of residuals. All assumptions of regression were met in the current sample. A missing values analysis was conducted to determine any patterns in the missing data. Less than 5% of the data was missing, and missing data were missing completely at random (MCAR) meaning that no systematic differences existed between participants with missing data and those with complete data. Therefore, available case analysis was utilized (Parent, 2013).

The first hypothesis was tested using a hierarchical regression analysis. PTG (Tedeschi & Calhoun, 1996), was entered as an outcome variable. In the first step of the regression analysis, loss context variables such as type of loss, gestation, personhood, trauma, time since first and last loss and demographic variables that were correlated with the main study variables, sexual orientation and social class, were entered as control
variables. In the second step of the regression analysis, attachment anxiety and attachment avoidance were entered to test the unique contribution of attachment to PTG when demographic and loss context factors were controlled for. In the third step, forms of dyadic coping (supportive, delegated, joint and stress communication), both individually and perceived from one’s partner, were entered to test whether the women’s experiences of dyadic coping following pregnancy loss were a significant predictor of growth (after controlling for attachment) and whether attachment avoidance and attachment anxiety will remain significant predictors of PTG after accounting for dyadic coping.

The second hypothesis that dyadic coping will mediate the relationship between attachment and PTG was tested using mediation analysis. Hayes’s (2014) PROCESS macro for SPSS (version 25) was employed to estimate the path coefficients in the mediation models. In the first model, the attachment anxiety, was entered as a predictor, participants’ DC was entered as a mediator and PTG was entered as the outcome variable. In the second model, the attachment avoidance was entered as a predictor, participants’ DC was entered as a mediator and PTG was entered as the outcome variable. Variables such as sexual orientation, social class and type of loss were entered as covariates to rule out the possibility of these factors accounting for the hypothesized effect (Lafarge et al., 2019). For inference about the significance of indirect effects and conditional indirect effects (i.e. mediation), PROCESS produces bias-corrected bootstrap confidence intervals based on a designated number of bootstrap samples. An effect is significant when zero is not contained within the confidence interval. A bootstrap methodology using 5,000 samples with 95% confidence intervals was utilized to calculate the indirect effect.
Results

Participants reported that pregnancy loss was a traumatic event ($M = 7.21$, $SD = 1.89$) and that at the time of loss they believed that the pregnancy/fetus was a person ($M = 8.11$, $SD = 2.05$). On average participants had a PTG total score of 52.76 ($SD = 23.48$), which is moderate. There are no published benchmarks to determine whether the current sample reported generally high or low levels of insecure attachment. Out of a possible score of 84, participants had a mean score of 23.57 ($SD = 7.78$) on the attachment anxiety subscale and 13.52 ($SD = 6.38$) on the attachment avoidance subscale with higher scores indicating higher attachment anxiety or avoidance. The scores in the current sample appeared to be similar to those observed in a sample of adults who experienced sudden or violent death of a family member (Captari et al., 2020). The majority of the participants reported that they were married ($n = 199, 81.6\%$) and currently in a relationship with a partner with whom they have experienced loss ($n = 226, 92.6\%$). An independent samples t-test was performed to investigate whether attachment security differed between participants who had ceased the relationship with the partner with whom they had experienced pregnancy loss since the loss compared with those who stayed in the relationship. The analysis indicated that participants who ceased the relationship had higher mean rates of attachment anxiety ($M = 29.0$, $SD = 8.51$) compared to those who stayed in the relationship ($M = 23.09$, $SD = 7.52$, $t(239) = -2.92$, $p = .004$). Similarly, participants who ceased the relationship had higher mean rates of attachment avoidance ($M = 17.8$, $SD = 7.45$) compared to those who stayed in the relationship ($M = 13.23$, $SD = 6.24$, $t(239) = -2.71$, $p = .007$).
In terms of participants’ DC, on average participants reported a score of 130 ($SD = 19.29$) which is within the normal range as compared with the healthy validation samples of the DCI (Ledermann et al., 2010). These were the means for each DCI subscale: stress communicated by oneself (SCO; $M = 15.34$, $SD = 2.70$), stress communication of the partner (SCP; $M = 13.06$, $SD = 3.22$), supportive dyadic coping by oneself (SDC; $M = 18.95$, $SD = 2.61$), supportive dyadic coping by partner (SDCP; $M = 18.41$, $SD = 4.27$) delegated dyadic coping by oneself (DDCO; $M = 7.93$, $SD = 1.53$), and delegated dyadic coping of the partner (DDCP; $M = 7.00$, $SD = 2.01$). Table 1 provides descriptive statistics and intercorrelations among the main study variables.

Significant positive correlations were found between PTG and type of loss ($r = .18$, $p < .005$), gestational age of the baby or fetus at the time of loss ($r = .18$, $p = .01$), perceived personhood related to pregnancy ($r = .24$, $p < .001$), and perceived level of severity of the experience ($r = .24$, $p < .001$). Significant positive correlations were found between PTG and forms of DC including SCO ($r = .17$, $p = .008$), DDCO ($r = .17$, $p = .01$) and the DCI total ($r = .19$, $p = .003$). Weaker but significant correlations were found between PTG and SDC ($r = .15$, $p = .02$), SDCP ($r = .16$, $p = .01$) and DDCP ($r = .14$, $p = .03$). No significant correlations were found between PTG and attachment subscales.

Participants who did not identify as straight showed higher rates of attachment anxiety ($r = -.21$, $p = .001$). Attachment anxiety was also negatively correlated with participants’ experience of social class ($r = -.18$, $p = .005$), positively correlated with attachment avoidance ($r = .47$, $p < .001$), and negatively correlated with forms of dyadic coping: SCP ($r = -.27$, $p < .001$), SDCP ($r = -.37$, $p < .001$), DDCP ($r = -.26$, $p < .001$) and DC total ($r = -.41$, $p < .001$). Attachment avoidance was not correlated with any
demographic or loss context variables at significance level of .01. At alpha level .05, attachment avoidance was positively correlated with type of loss \((r = .15, p = .02)\). Attachment avoidance was negatively correlated with all forms of dyadic coping: SCO \((r = - .48, p < .001)\), SDC \((r = - .30, p < .001)\), DDCO \((r = - .19, p = .003)\), SCP \((r = - .25, p < .001)\), SDCP \((r = - .47, p < .001)\), DDCP \((r = -.38, p < .001)\) and DCI total \((r = -.57, p < .001)\). Table 1 provides correlations between the main variables used in this study.

**Multiple Regression Analysis**

**Attachment Security and PTG**

A hierarchical regression was conducted to test the first hypothesis, that attachment security would be a positive significant predictor of global PTG when controlling for loss context factors and forms of DC. PTG was used as the outcome variable. Loss context variables such as type of loss, gestation, personhood, trauma and demographic variables that were correlated with the main study variables such as sexual orientation and social class were entered in the first step, the attachment anxiety and attachment avoidance scores were entered in the second step and forms of DC were entered in the third step. The results showed that the loss context variables explained 11.9% of the variance in the PTG, \(F(6, 237) = 5.20, p < .001\). Perceived personhood and severity of trauma were the strongest predictors in the model \((\beta = .15, p = .03, 95\% CI [.14, 3.27] \text{ and } \beta = .15, p = .03, 95\% CI [.19, 3.55] \) respectively); greater perceived personhood at the time of loss and greater severity of trauma were associated with greater PTG. The addition of the attachment anxiety and attachment avoidance scores did not significantly improve the prediction \((R = .35, R^2 = .12, R^2 \text{ change } = .001, p = .86)\). Adding forms of DC (stress communication, supportive dyadic coping, delegated dyadic
coping) to the model improved the prediction with the final model explaining 17.7% of variance \((R = .42, R^2 = .18, R^2 \text{ change} = .06, F(14, 237) = 3.44, p < .001)\). Perceived personhood \(\beta = .16, p = .03, 95\% \text{CI} [.28, 3.41]\) was a significant predictor. Therefore, the results do not provide support for the first hypothesis that attachment security would be a positive significant predictor of global PTG when controlling for loss context factors and forms of DC. See Table 2 for model summaries and final model regression coefficients.

**Mediation Analysis**

No direct relationship was found between attachment security and PTG. However, the mediation analysis was conducted given Hayes and Rockwood’s (2017) recommendation that an association between X and Y prior to testing the hypothesis is not necessary. The lack of a linear relationship between X and Y does not indicate that X does not affect Y (Hayes & Rockwood, 2017).

**Attachment Anxiety as Mediator**

A mediation analysis was conducted to test the second hypothesis that attachment anxiety and PTG would be mediated by forms of DC. PTG was entered as the outcome variable, attachment anxiety was entered as a predictor, and the DC was entered as the mediator. Sexual orientation and social class were included as covariates. Both variables were dummy coded prior to being used in the analysis. There was a significant direct effect between attachment anxiety and DC \((b = -.98, p < .001)\) and significant direct effect between the PTG and the DC \((b = .21, p = .013)\). The unstandardized indirect effect coefficient indicated that the DC mediated the relationship between attachment anxiety and PTG, \(b = -.21, 95\% \text{ CI} [-.42, -.03]\), providing support for the first hypothesis (See Figure 1). No direct or total effect of attachment on PTG was found.
Attachment Avoidance as Mediator

A mediation analysis was conducted to test the second portion of the second hypothesis that attachment avoidance and PTG will be mediated by forms of DC. PTG was entered as the outcome variable, attachment avoidance was entered as a predictor, and the DC was entered as the mediator. Type of loss was dummy coded and included as a covariant. There was a significant direct effect between attachment avoidance and DC \((b = -1.83, p < .001)\) and significant direct effect between PTG and DC total \((b = .29, p = .002)\). The unstandardized indirect effect coefficient indicated that DC mediated the relationship between attachment avoidance and PTG, \(b = -.54, 95\%\) CI \([- .99, -.13]\), providing support for the hypothesis (See Figure 2). No direct or total effect of attachment on PTG was found.

Discussion

The purpose of the current study was to investigate the relationship between individuals’ adult attachment, dyadic coping and PTG following miscarriage or stillbirth. Specifically, the study explored whether attachment security is a significant predictor of PTG when loss context factors are controlled for and whether the relationship between attachment security and PTG is mediated by forms of dyadic coping. The majority of the women in the sample reported to be in a relationship with a partner with whom they have experienced loss. However, those who had since dissolved the relationship reported higher levels of attachment insecurity compared to those who had not. Dyadic coping rates in the current sample were within a normal range, suggesting that on average, following pregnancy loss participants were able to utilize their partners to reduce their stress levels. Attachment avoidance and attachment anxiety were negatively correlated
with forms of dyadic coping, providing evidence that attachment security is related to couples’ relational functioning following a stressful event. Higher attachment insecurity was related to low dyadic coping as predicted by attachment theory (Fraley & Shaver, 1998) and indicated by previous research (e.g. Alves et al., 2018; Fuenfhausen & Cashwell, 2013).

Women in this study reported moderate levels of PTG which is consistent with the current literature on PTG levels in women who have experienced miscarriage or stillbirth (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). Attachment security was not correlated with levels of PTG which is not in line with the findings of studies conducted with other bereaved populations (Levi-Belz & Lev-Ari, 2019) but is consistent with results found in a community sample where 12% of the participants had experienced a miscarriage (Volgin & Bates, 2016). Attachment avoidance and attachment anxiety were not significant predictors of PTG when loss context factors and forms of dyadic coping were entered in the hierarchical regression model, providing lack of support for the first hypothesis. As this was the first study to investigate the relationship between attachment security and PTG in a sample of perinatally bereaved women, any comparisons or conclusions about this finding are hard to draw.

Previous research showed inconsistent findings in terms of the existence of the relationship as well as the direction of the relationship between attachment anxiety, attachment avoidance and PTG. Dekel (2007) reported that higher levels of attachment avoidance contributed positively to PTG among wives of prisoners of war. On the other hand, more recently researchers have found attachment avoidance to be a negative
predictor of PTG (Arikan et al., 2016; Levi-Belz & Lev-Ari, 2019; Yu et al., 2016) in bereaved and traumatized samples. Yu et al. (2016) suggested that the inconsistencies in findings may be related to a lack of consensus regarding how attachment is defined and measured. The current study used a short version of the ECR scale (Brennan et al., 1998; Wei et al., 2007) compared to a longer version of the same instrument used in Arikan et al., (2016) and Yu et al.’s, studies (2016) or the Relationship Questionnaire (Bartholomew & Horowitz, 1991) used in Levi-Belz and Lev-Ari’s (2019) study where attachment avoidance is treated as an attachment type with low levels of anxiety (Hazan & Shaver, 1987). Further research is needed to clarify the relationship between attachment dimensions and PTG in women who have experienced miscarriage or stillbirth. Additionally, the current findings showed that the perceived personhood of the pregnancy/fetus was a significant predictor of PTG when loss context factors, attachment, and dyadic coping were entered in the model.

Participants’ dyadic coping was positively correlated with PTG, indicating that women who reported more positive overall dyadic coping, as well as forms of dyadic coping such as stress communication, supportive dyadic coping by oneself, supportive dyadic coping by partner, and delegated dyadic coping by oneself, reported higher levels of PTG. The only form of dyadic coping that PTG was not correlated with was stress communication of the partner, which is not consistent with the findings from a sample of bereaved parents (Albuquerque et al., 2018). Available literature suggests that men and women have similar emotional responses to miscarriage but differ in the expression of emotion and coping strategies (Abboid & Liamputtong, 2002; Hiefner, 2020). A recent phenomenological study indicated that partners differ in their need to talk about the loss
versus need to grieve privately (Hiefner, 2020). Therefore, it is possible that for women, communicating their distress to their partners is a more important factor contributing to their experience of PTG than receiving distress communication from their partners. Further research is needed to verify whether this finding was unique to this sample.

Mediation analysis results suggest that the relationship between attachment anxiety, attachment avoidance and PTG exists through dyadic coping. Specifically, the analysis indicated that women who were securely attached prior to a traumatic event showed higher levels of positive dyadic coping, and higher levels of PTG through dyadic coping. The findings suggest that having mutual support between partners who share lived experience may be particularly important for individuals’ adjustment and experience of growth following pregnancy loss. This finding is consistent with the theory of PTG, which proposes that sharing automatic intrusive thoughts with someone who can offer a different perspective based on their own experiences can foster the development of new schemas and contribute to the experience of growth (Tedeschi et al., 2018).

Having an understanding between partners who have experienced miscarriage as shared loss may facilitate the relational processes that enable dyadic coping (Hiefner, 2020) and foster individual positive adjustment.

**Clinical Implications**

The current study has several implications for clinicians who work with women who have experienced pregnancy loss. The findings indicate that perceived personhood of the pregnancy/fetus at the time of loss is an important factor contributing to positive post-loss adjustment. Women who believed that the pregnancy/fetus was a baby are more likely to experience higher levels of PTG. As core belief challenge is an important aspect
of the PTG theory (Tedeschi et al., 2018), pregnancy loss may be more likely to shatter women’s beliefs if they thought that the pregnancy or the fetus was a person who died outside of the typical circle of life (Freedle & Kashubeck-West, 2020). This study provides further evidence that personhood rather than gestational age is a better predictor of women’s post loss adjustment (Robinson et al., 1999). Therefore, clinicians should assess women’s perceived personhood early on in the therapeutic process to better understand women’s risk and resilience factors that may impact their journey following pregnancy loss.

Clinicians should also be aware that adult attachment insecurity may impact women’s ability to deal with external stress following pregnancy loss, putting them at risk for dissolution of the partnered relationship. Therefore, assessing women’s adult attachment patterns and focusing the treatment on increasing relational security may be an important first step with individual’s who present to counseling following miscarriage or stillbirth. Attachment-oriented therapy aims to enable partners to perceive each other as a secure base and encourage them to experience and share emotions (Overall & Simpson, 2013). Recent findings from the meta-analysis exploring association between client’s attachment and therapy outcomes showed that improvements in attachment security during therapy may coincide with improved treatment outcomes (Levy et al., 2018).

Moreover, a couple’s positive dyadic coping may influence a woman’s growth following loss. Exploring women’s ability to: 1) communicate their thoughts and feelings following the loss, 2) request and provide emotional or practical support, and 3) utilize their partner’s ability to take on responsibilities to reduce their stress may provide
important insights about couples’ attachment needs and functioning following pregnancy loss.

Limitations

There were several limitations of this study that restrict its generalizability and implications. Participants were mostly recruited via social media. It is possible that women who are online differ from women who have experienced pregnancy loss and are not part of an online communities in terms of their levels of attachment and dyadic coping. Moreover, the sample consisted of predominately well-educated, White women; therefore, the generalizability of these findings to diverse populations is limited. The sample predominately consisted of women who have experienced miscarriage and not stillbirth, which could have underrepresented the predictive value of personhood. It is possible that the hypothesized effects would have been stronger if the sample was more equally split between the type of loss women experienced. The results are also limited in that they only include one partner’s perspective rather than having matched partner data.

Furthermore, the study was a correlational, cross-sectional design; therefore, causality cannot be inferred. Also, it is possible that the relationship between variables is not linear; this was not detectable via this study’s design and method of analysis. This study relied on retrospective methods of self-report which could be limited by participants’ ability to accurately recall their thoughts, feelings and coping at the time of loss.

Future Research

Based on the limitations of this study, future research should include a more diverse sample. Given the higher risk of perinatal loss in women of color (Mukherjee et
al., 2013), it is important to understand their experiences and factors contributing to psychological growth following pregnancy loss. Alternative methods of participant recruitment may need to be utilized to reach a diverse sample. Because of the ongoing COVID-19 pandemic the data collection took place exclusively online. Engaging in in-person recruitment strategies that involve collaboration with community members and stakeholders may be important in gaining trust and reducing the historically negative impact of racism in psychological research (Miller, 2019). Similarly, it is important to understand the experiences of queer and same-sex couples, who continue to be neglected in the scientific perinatal loss literature.

Based on the current findings, future research should further explore the relationship between adult attachment security and PTG in a sample of perinatally bereaved couples. This study was the first known study to utilize ECR-S (ECR-S; Brennan et al., 1998; Wei et al., 2007) to measure attachment security in women who experienced pregnancy loss. Further research is needed to clarify the relationship between attachment dimensions and PTG to ensure that the findings were not specific to the current sample or the measure of attachment. Exploring partners’ attachment styles and analyzing their data jointly rather than separately can provide additional insight regarding couples’ functioning. Such an approach could provide evidence regarding whether secure functioning of the couple supports individuals’ posttraumatic growth. Additionally, differences in partner needs and strategies to cope with feelings of grief and loss should be explored.

Longitudinal research with repeated measures across time could also help clarify the impact of the timing of the support needed. The positive relational and psychological
outcomes as well as negative psychological outcomes such posttraumatic stress or grief should be explored to provide a broader clinical picture of couples’ functioning following pregnancy loss. Future research should also clarify the relationship between the type of loss and couples’ functioning. Such studies may contribute to increased understanding of risk and resilience factors that can aid in the development and utilization of prevention strategies to reduce the chances of relationship dissolution and negative mental health outcomes.

**Conclusion**

This study contributes to the limited literature focused on women’s experiences of relational experiences and social support following pregnancy loss and its relationship to positive psychological outcomes. Findings suggest that dyadic coping mediates the relationship between attachment anxiety/attachment avoidance and PTG. The current study adds to our understanding of how adult attachment style can relate to women’s dyadic coping following pregnancy loss as well as how relational experiences within a romantic relationship can aid in women’s experiences of PTG. Based on the current findings, it is important for clinicians to assess partners’ attachment styles and dyadic coping when working with couples who present for counseling following miscarriage or stillbirth. Future research is needed to further explore the relationships using diverse samples that include partner data.
Manuscript 2

Can We Talk About It? The Relationship Between Disclosure and Posttraumatic Growth Following Miscarriage

Pregnancy loss continues to be a complex and misunderstood type of loss that may impact the social support individuals receive. The continued social stigma surrounding the topic of pregnancy loss (Bierely-Jones et al., 2015; Markin & Zilcha-Mano, 2018), misinformation in the general public regarding the impact of pregnancy loss on an individual's adjustment (Bellhouse et al., 2018), and social constraints placed on the grieving process (Lang et al., 2011) may act as barriers for individuals to discuss their thoughts and emotions surrounding the event. However, engaging in interpersonal activities such as disclosing feelings may be an important factor in the positive aftermath of traumatic events (Levi-Belz, 2019). Research shows that self-disclosure is associated with higher levels of posttraumatic growth (PTG; Dong et al., 2015; Stockton et al., 2014), which is a positive psychological change an individual can experience when struggling with a devastating and life-altering event (Calhoun & Tedeschi, 2001; Calhoun et al., 2010).

Despite an increase in professional literature and social media movements focused on breaking the stigma associated with miscarriage through sharing personal experiences (e.g. Mercier et al., 2020; Meyer, 2016), the impact of self-disclosure on an individual's post-loss adjustment continues to be unexplored. Theories of PTG suggest that self-disclosure may help facilitate the meaning-making process through engagement in deliberate rumination, which may act as an important cognitive process that precedes PTG (Tedeschi et al., 2018).
To date, no studies have tested this model with women who have experienced miscarriage. This study aimed to explore the relationship between self-disclosure, positive social reactions to disclosure, and women’s cognitive processes (i.e., rumination) on the levels of posttraumatic growth following miscarriage. This study’s findings can aid in understanding women’s experiences, provide empirical support for the PTG model and contribute to the development of a growth-oriented approach to treatment.

**Pregnancy Loss and Self-Disclosure**

Pregnancy loss has been identified as not only a bereavement event that is followed by an extensive period of grief (deMontiny et al., 2017) but also as a potentially traumatic event (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). In the U.S., it is estimated that 10-15% of clinically recognized pregnancies result in a miscarriage, making it the most common type of pregnancy loss in the United States (March of Dimes, 2020a). Nevertheless, most women will go on to have successful pregnancies following a miscarriage (March of Dimes, 2020a), making it crucial to provide adequate supports to ensure a healthy perinatal environment for a subsequent pregnancy (Côté-Arsenault et al., 2001; Côté-Arsenault et al., 2004).

Despite high rates of pregnancy loss in the U.S., it continues to be a stigmatized event that can impact women’s willingness to share their experiences. Self-disclosure has been defined as a process by which a person allows themselves to be known by others (Jourard, 1971). Research shows that being able to discuss one’s genuine feelings and thoughts with someone is an important component of the healing process and can be related to positive psychological symptoms and physical health (Frattaroli, 2006; Smyth et al., 2012). Engaging in high levels of disclosure about the death of a relative has been
associated with a decrease in levels of grief and negative mental health symptoms (Feigelman et al., 2017).

Several features of miscarriage make it a unique experience compared to other more socially sanctioned losses, which may explain women's willingness to share their experiences with others. First, many ambiguities and misconceptions surround the event. Women may not know when the death occurred or the cause of death and can struggle with forming a conceptualization of what exactly has been lost, especially in the case of an early miscarriage (Frost et al., 2007). The lack of clear answers to women's crucial questions regarding reasons for the loss and its meaning for their future combined with the general public's incorrect perceptions of the prevalence and reasons for miscarriage (Bardos et al., 2015) can act as a barrier to disclose the loss to others (Nynas et al., 2015). For example, women may be worried that others will blame them for the loss as if they had control over it (Bellhouse et al., 2018). Same-sex couples who experience loss in a heterosexist society may feel that their right to seek motherhood in the first place may be questioned (Craven & Peel, 2014). Moreover, community members may not understand that women can experience intense feelings of grief as well as other negative mental health outcomes following a loss and hence not offer support following miscarriage (Bellhouse et al., 2018; Cacciatore, 2010).

Secondly, there continues to be secrecy surrounding miscarriage. For example, there is a "12-week rule", which presumes that women should not disclose their pregnancy before twelve-weeks gestation, as this is the period when a pregnancy is most susceptible to loss (Bellhouse et al., 2018, March of Dimes, 2020). As a result, when early miscarriage takes place, women who kept their pregnancy a secret would have to
disclose both the pregnancy and miscarriage simultaneously. Since their typical social
support system may not be aware of their experiences, women may opt to cope with their
loss in secrecy as well (Bellhouse et al., 2018; Markin & Zilcha-Mano, 2018).

Third, in the U.S., a pregnancy loss may not be perceived to be as painful or as
significant as other deaths (Lang et al., 2011; Markin & Zilcha-Mano, 2018) and
therefore may not be met with the same social recognition (Burden et al., 2016). Women
who communicate their grief may be met with denial or intellectualization of their
experiences which may discourage them from further disclosure of their experiences
associated with loss (Bellhouse et al., 2018; Meyer, 2016). Women may be met with
statements such as "it just wasn't your time", "good thing it happened now before it was a
real baby" and "you're so much better off" that simplify the stigmatized nature of
pregnancy loss (Meyer, 2016). Additionally, lesbian couples can encounter comments
based on a flawed logic that they can just "swap" which partner is going to carry the baby
(Craven & Peel, 2014). Comments such as these minimize women’s experiences of grief
(Markin, 2017) and can discourage women from further disclosing their feelings and
seeking additional social support.

Overall, there is a stigma associated with miscarriage that leaves women feeling
isolated and alienated, which may impact their subsequent psychological adjustment
(Brierley-Jones et al., 2015; Markin & Zilcha-Mano, 2018). Constant reminders of the
loss, such as pregnant friends or friends with young children, may make women feel
resentful which can foster avoidance or withdrawal from their typical social networks
(Cacciatore, 2010). However, the impact of the persistent social stigma on an individual's
engagement in self-disclosure and the impact of self-disclosure on post-loss outcomes
have not been explicitly studied in this population. PTG theory suggests that self-disclosure may be an important factor contributing to positive post-loss adjustment (Tedeschi et al., 2018). Therefore, having a greater understanding of processes that may impact individuals PTG following loss is crucial.

**Self-Disclosure, Rumination, and PTG**

PTG focuses on long-term, transformative changes that individuals experience after a traumatic event (Tedeschi et al., 2018). PTG can happen in five major domains of life: “greater appreciation of life and changed sense of priorities; warmer more intimate relationships with others; a greater sense of personal strength; recognition of new possibilities or paths for one’s life; and spiritual development” (Tedeshi & Calhoun, 2004, p.6). The PTG model assumes that for growth to occur, individuals have to experience a traumatic event that shatters their assumptive world view. The challenge to an individual’s core beliefs evokes an internal struggle between a person’s previous assumptions about the world and new insight gained following the traumatic event. Cognitive struggle with traumatic circumstances plays a key role in PTG (Tedeschi et al., 2018). Challenges to core beliefs are often stressful and generally lead to initial emotional distress. Both challenges and emotional distress interactively initiate ruminative thoughts.

Two different types of rumination are often activated in this process: 1) intrusive rumination, characterized as uncontrolled, invasive thoughts and images that typically occur immediately after the event and are associated with symptoms of distress (Cann et al., 2011), and 2) deliberate rumination, a more intentional and reflective type of rumination. An individual engages in deliberate rumination when they purposefully try to understand the events and their implications (Martin & Tesser, 1996), which requires
more conscious, effortful cognitive work (Tedeschi et al., 2018). Deliberate rumination is also an attempt to adapt to the changed circumstances of life and develop a revised core belief structure that accounts for them, which is a crucial aspect of PTG theory. Through this cognitive process, individuals seek to integrate traumatic experiences into their life narrative.

Self-disclosure can affect cognitive processes that play a major role in PTG. Traumatic events often force people to ruminate about what has happened. Talking or writing about one's thoughts, emotions or feelings about a traumatic event can foster qualitative changes in cognitive processing (Tedeschi et al., 2018). The PTG model suggests that self-disclosure can shift the characteristics of ruminative thought from mostly automatic and intrusive to more deliberate, thereby providing a chance to reassess life goals and create a meaningful narrative (Tedeschi et al., 2018). It is theorized that self-disclosure has a long-term effect on the experience of PTG as people need time to ruminate about what they disclosed and continue to make sense of it.

There is growing support for the importance of self-disclosure in PTG in various populations who have experienced a traumatic event. Available literature indicates that individuals who have disclosed a traumatic event reported higher levels of PTG compared to those who have not (Dong et al., 2015; Stockton et al., 2014). Moreover, individuals who have discussed positive consequences of a traumatic experience reported more deliberate rumination compared to those who have not (Lindstorm et al., 2013). These findings provide preliminary support for the theory that the act of disclosing can help people reflect, make sense of what happened, accept the reality of their experience and gain insight (Tedeschi et al., 2018).
The reaction individuals receive following a disclosure may also be an important factor in individuals’ post-loss adjustment. A study by Taku and colleagues (2009) indicated that the recipient’s reaction to a disclosure was an important factor contributing to levels of PTG in a sample of Japanese college students who experienced a traumatic event. Individuals who perceived a recipient's reaction as positive reported more growth than those who perceived recipients' reactions as negative (Taku et al., 2009). Similarly, Ullman (2014) found that positive social reactions to disclosure of a sexual assault that included acknowledgement and support were related to greater posttraumatic growth. Therefore, it is likely that the combination of self-disclosure with accepting and supportive responses to disclosure are important factors in process and outcome of PTG (Calhoun & Tedeschi, 2013).

Despite the rise in research investigating the relationship between trauma and PTG, few studies have considered the extent to which positive transformation occurs following pregnancy loss. The available literature shows that women experience moderate levels of PTG following pregnancy loss. Researchers indicated that core belief challenge is an important predictor of PTG (Krosch & Shakespeare-Finch, 2017) and that rumination can act as a mediator between core belief challenge and PTG (Freedle & Kashubeck-West, 2020) as well as grief and PTG (Lafarge et al., 2019).

However, the role of social support and self-disclosure specifically are still unexplored in this population. Studies conducted with other bereaved and stigmatized populations showed that self-disclosure positively contributed to PTG levels, concluding that it may play an important role in facilitating PTG (Levi-Belz, 2019). Therefore,
further research is needed to investigate factors and mechanisms that contribute to positive psychological growth following a miscarriage.

**Current Study**

There is a paucity of research examining how PTG may occur following the most common type of pregnancy loss (i.e. miscarriage) and factors that may contribute to it. The theorists of PTG suggest that self-disclosure can have an impact on the type of rumination an individual engages in, which in turn will predict an individual's level of growth following a traumatic event. Despite promising research findings, such a relationship has not been tested in women who have experienced miscarriage, a stigmatized traumatic event. This study aimed to address gaps in the current research and investigate the relationship between self-disclosure, positive social reactions, rumination, and PTG. The following hypotheses were tested:

*Hypothesis 1:* Self-disclosure will be a positive significant predictor of deliberate rumination and PTG when loss context factors are controlled for.

*Hypothesis 2:* Deliberate rumination will mediate the relationship between self-disclosure and PTG.

*Hypothesis 3:* Positive social reactions to disclosure will moderate the indirect path (via deliberate rumination) and direct path from self-disclosure to PTG.

  *a*) For the moderated indirect effect, it is hypothesized that the association between self-disclosure and PTG through deliberate rumination will be stronger for women who report higher rates of positive social reaction than for those who report lower rates of positive social reactions following a disclosure of pregnancy loss.
b) For the moderated direct effect, it is hypothesized that the association between self-disclosure and PTG will be stronger for women who report higher rates of positive social reaction than for those who report lower rates of positive social reactions following a disclosure of pregnancy loss.

**Methods**

**Participants**

The final sample was comprised of women \((n = 227)\) who experienced miscarriage, defined as a loss of a pregnancy before 20 weeks gestation. Participants were predominately White \((n = 187; 82.4\%)\), middle class \((n = 111, 48.9\%)\), heterosexual \((n = 197, 86.8\%)\) well educated (bachelor’s degree or higher \(n = 135, 59.5\%)\), employed on a full-time basis \((n = 129, 56.8\%)\) and married \((n = 187, 82.4\%)\). Mean age of the participants was 32.01 years \((SD = 6.37, \text{range 19-54})\).

The most recent pregnancy loss occurred on average 3.07 \((SD = 4.04)\) years ago, with timing of loss ranging from less than a month ago to 25 years ago, and the mean gestation weeks at the time of the first loss was 9.04 \((SD = 3.87)\). Over half of the participants experienced multiple pregnancy losses \((n = 120, 52.9\%)\). Participants reported experiencing up to 9 pregnancy losses with a mean of 2.01 \((SD = 1.57)\) losses. A small percentage of all reported pregnancy losses were associated with fertility treatment \((n = 22, 9.7\%)\). The majority of the sample reported that they had living children \((n = 163, 71.8\%)\) and the timing of loss was split between having the loss before living children \((n = 63, 27.8\%)\), after \((n = 52, 22.9\%)\) or both \((n = 47, 20.7\%)\).
Procedure

Participants were recruited using convenience and snowball sampling methods. The recruitment strategy included creating an advertisement that ran on two social media platforms (i.e. Facebook and Instagram). The advertisement was set to target women aged 18 to 45, meaning that the information about the study was shown to all Facebook or Instagram women who fit that demographic. The invitation to participate in the study was also posted on researcher’s social media accounts as well as online websites (e.g., Reddit). From the researcher’s social media account, the invitation was shared 15 times; further shares were not tracked.

To be eligible to participate, individuals had to be over 18 years old, have experienced miscarriage defined as loss of a pregnancy before 20 weeks gestation. Participants who self-identified with the eligibility criteria and clicked the continue button, signifying their consent to participate in the study, where asked to complete an online survey. At the end of the survey, the study purpose was reiterated and a list of mental health resources and supports available was provided in case the survey questions were emotionally disturbing. Additionally, upon completion of the survey, participants were asked if they would like to enter a drawing to receive a gift card. This survey was not linked in any way with participants’ previous responses and appeared whether or not participants answer all of the questions. The gift cards winners were contacted individually by the researcher. Participation was voluntary and confidential. The study was approved by University of Missouri-St. Louis Institutional Review Board.

Initially, 464 participants started the online survey; 276 people completed the survey. The 40.5% dropout rate included 48 participants who opened the survey but did
not answer any questions, two participants who did not consent to take part in the survey, and three participants who did not meet the eligibility criteria and were automatically removed from the survey by Qualtrics. The remaining drop out (n = 135) was likely due to the survey length. Additionally, 38 participants were excluded due to experiencing a pregnancy loss other than miscarriage, two participants were excluded from the analysis for reporting that they were born male, and two for being from outside of the U.S. Participants from outside of the U.S. were excluded due to potential cultural differences in how miscarriage is managed and discussed (Chalmers & Meyer, 1992). During the data cleaning process six participants were excluded for being univariate outliers, defined as those scoring more than 3.29 standard deviations from the mean on the main study variables, and one for being multivariate outlier, as identified by Mahalanobis distance score higher than the critical value of 13.28.

**Measure**

**Demographics and Loss Context Variables**

Demographic information was collected including current age, ethnicity, educational level, employment status, current income, and relationship status. Loss context factors included the number of miscarriages, time since the loss, gestational age of the baby or fetus at the time of loss, and whether participants have had living children. Participants were asked to rate the severity of their pregnancy loss experience from 0 (*not traumatic*) to 9 (*very severely traumatic*) based on the provided definition of a traumatic event that is consistent with the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) conceptualization of trauma (APA, 2013). This question has been previously used in trauma research to control for trauma severity (e.g., Krosch & Shakespeare-Finch,
The perceived personhood related to pregnancy was assessed by a 10-point Likert-type scale (0 not at all to 9 very great degree) indicating the degree to which participants believed their baby or pregnancy was a person (Krosch & Shakespeare-Finch, 2017).

**Self-Disclosure**

In order to assess whether or not participants disclosed their miscarriage, participants were asked whether they disclosed their experience of miscarriage to family, friends or others (yes or no). The Distress Disclosure Index (DDI; Kahn & Hessling, 2001) was used to assess individuals’ tendency to conceal versus disclose personally distressing information. The DDI is a 12-item measure with responses being on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The total score can range from 12 to 60, with higher scores indicating a greater tendency to disclose distress. The measure has shown good construct and discriminant validity. Confirmatory factor analysis of the DDI suggested a single construct, with self-disclosure on one end and self-concealment on the other (Kahn & Hessling, 2001). The scale has shown excellent internal consistency (α = .92; Levi-Belz, 2016) in a sample of bereaved individuals. The Cronbach alpha in the current sample was .94.

**Social Reactions**

Social reactions to disclosure was measured via the Social Reactions Questionnaire (SRQ; Ullman, 2000). SRQ was designed to measure perceptions of both positive and negative reactions to disclosure of a sexual assault experience. However, it has been used in other traumatized populations including a sample of women who have experienced reproductive trauma (Sharp, 2018). Previous research indicated that women who have experienced traumatic childbirth experiences, including pregnancy loss,
compared it to the experience of sexual victimization (Beck, 2004). SRQ consists of 48-items with responses being on a 5-point Likert scale ranging from 0 (never) to 4 (always). The SRQ has seven different subscales which represent common reactions to disclosure of a sexual assault: emotional support, treated differently, distraction, taking control, tangible aid/instrumental support, victim blame, and egocentric reactions.

For the purpose of the study only the subscales that represent positive social reactions (i.e. emotional support subscale and the tangible aid/instrumental support) were used. The emotional support subscale consists of 15 items and assesses positive social reactions such as expressions of love, caring, and esteem from others. The tangible aid/instrumental support subscale consists of five items and assesses actions, tangible assistance, advice or information from. One item from the tangible aid/information support subscale was not included as it is relevant to sexual assault but not pregnancy loss (“Took you to the police”). Higher scores on each of these subscales indicate positive social reactions to disclosure. A composite variable of positive social reactions was computed and was included the items from the emotional support subscale and the tangible aid/instrumental support subscales. Additionally, for the purpose of this study the instructions were added to ensure that participants were indicating how often they have experienced each of the listed responses from other people following their disclosure of pregnancy loss rather than their sexual assault.

The scale has shown evidence of several forms of validity, good test-retest reliability over two months in a sample of adult sexual assault victims ($rs = .68$ to $.77$) and excellent internal consistency (emotional support subscale $\alpha = .93$; tangible aid/information support $\alpha = .84$; Ullman, 2000) in a sample of adult sexual assault
victims as well as women who have experienced traumatic childbirth (emotional support subscale $\alpha = .89$; adapted for the study tangible aid/information support subscale $\alpha = .76$; Sharp, 2018). The positive social reactions composite was used in Ullman’s (2014) study and showed excellent internal consistency ($\alpha = .92$). In the current sample the Cronbach alpha for the positive social reactions composite was .90.

**Rumination**

Rumination was measured via the Event-Related Rumination Inventory (ERRI; Cann et al., 2011), a measure designed to assess rumination immediately following a specified life event. The ERRI includes 10 items assessing intrusive thoughts related to the event and 10 items assessing deliberate thinking about the event. Responses for both the deliberate and intrusive rumination items range from 0 (*not at all*) to 3 (*often*). Examples of individual items include “I thought about the event when I did not mean to,” (intrusive rumination) and “I thought about what the experience might mean for my future,” (deliberate rumination), with higher scores indicating more rumination about the event. The two-factor structure of the ERRI has been supported in exploratory and confirmatory factor analyses (Cann et al., 2010). The scale has shown excellent internal consistency (intrusive rumination $\alpha = .94$; deliberate rumination $\alpha = .88$; Cann, et al., 2011) in a sample of undergraduate students who experienced a highly stressful event. For the purpose of this study, only the deliberate rumination subscale was used. The Cronbach alpha in the current sample was .94.

**Posttraumatic Growth**

Posttraumatic growth was measured using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), a 21-item measure of positive changes that may be
experienced in the aftermath of trauma. Participants rated the occurrence of personal changes they experienced following their pregnancy loss from 0 (not at all) to 5 (a very great degree). The PTGI yields a total score of posttraumatic growth as well as scores for five dimensions: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. For the purpose of this study only the total PTGI scores will be included in the analysis. The PTGI showed excellent internal consistency in a sample of women who experienced pregnancy loss (α = .92, Krosch & Shakespeare-Finch, 2017 and current sample), acceptable test-retest reliability over two months (r = .71; Tedeschi & Calhoun, 1996). Factor analyses confirmed the five-factor structure of the PTGI (Morris et al., 2005). The Cronbach alpha in the current sample was .93.

Data Analysis

Descriptive statistics was calculated to investigate the rates of self-disclosure, social reactions, rumination, and posttraumatic growth as well as to explore the sample’s demographic information. Moreover, bivariate correlations using Pearson's correlation coefficient were conducted to examine whether demographic factors, loss context factors, self-disclosure, positive social reactions and rumination are related to PTG. Due to a large number of correlations, a Bonferroni correction was applied. Before conducting regression and mediation analyses, the data was checked for: univariate outliers using z-scores; multivariate outliers using Mahalanobis Distance; multicollinearity using Person’s correlation coefficient; linearity using a scatterplot matrix, homoscedasticity and normally distributed errors using Q-Q plots of residuals. All assumptions of regressions were meet. A missing values analysis was conducted to determine any patterns in the missing data. Less than 5% of the data was missing, and missing data were missing
completely at random (MCAR) meaning that no systematic differences exist between participants with missing data and those with complete data. Therefore, available case analysis was utilized (Parent, 2013).

The first hypothesis, that self-disclosure will be a positive significant predictor of deliberate rumination and PTG when loss context factors are controlled for, was tested using two hierarchical regression analyses. In the first analysis, the PTG was entered as the outcome variable. In the first step of the regression analysis, control variables that were correlated with the outcome variables such as the time since the loss(es), perceived personhood and severity of trauma were entered. In the second step of the regression analysis, self-disclosure was entered to test the unique contribution of it to PTG when loss context factors were controlled for. In the second analysis the deliberate rumination score was entered as the outcome variable. In the first step of the regression analysis, control variables that were correlated with the outcome variables, such as the time since the loss(es), perceived personhood and severity of trauma were entered. In the second step of the regression analysis, the self-disclosure score was entered to test the unique contribution of it to deliberate rumination when loss context factors were controlled for.

The second hypothesis, that deliberate rumination will mediate the relationship between self-disclosure and PTG, was tested using the mediation analysis. Hayes’s (2014) PROCESS macro for SPSS (version 25) was employed to estimate the path coefficients in the mediation model. Self-disclosure was entered as a predictor, deliberate rumination was entered as a mediator and PTG was entered as the outcome variable. Variables that showed significant associations with deliberate rumination such as time since loss, perceived personhood, and severity of trauma were entered as covariates to
rule out the possibility of these factors accounting for the hypothesized effect (Lafarge et al., 2019). For inference about the significance of indirect effects and conditional indirect effects (i.e. mediation), PROCESS produces bias-corrected bootstrap confidence intervals based on a designated number of bootstrap samples. An effect is significant when zero is not contained within the confidence interval. A bootstrap methodology using 5,000 samples with 95% confidence intervals was utilized to calculate the indirect effect.

The third hypothesis, that positive social reactions to disclosure will moderate the indirect and direct oath from self-disclosure to PTG was tested using moderated mediation PROCESS macro (Hayes, 2013). Conceptually, moderated mediation is when an indirect effect varies across levels of the moderator variable (Preacher et al., 2007). PROCESS generates the index of moderated mediation and the bias-corrected bootstrap confidence intervals (CI). The hypothesized model included that the positive social reactions would moderate: a) the indirect effect of self-disclosure on PTG through deliberate rumination, and b) the direct effect of self-disclosure on PTG (see Figure 1).

According to Hayes (2015), if the index of moderated mediation is significant, it indicates that the conditional indirect effects at different levels (e.g., at one SD above, below, and at the mean) of the moderator variable were significantly different from one another. This provides support that the moderated mediation effects are significant. Furthermore, for simple indirect effects, PROCESS also generates the bias-corrected CI at one SD above, below, and at the mean. A total of 1,000 bootstrap samples and a 95% CI for these estimations was used. If the 95% CI for the average estimates of these 1,000 indirect effects does not include zero, it indicates that the indirect effect is statistically significant at the .05 level (Shrout & Bolger, 2002). The conceptual model and statistical
template of Model 8 (Hayes, 2013) fits best with the third hypothesis and was therefore be used for the moderated mediation analysis.

Results

The majority of participants reported that they believed that the pregnancy/fetus was a person, with 75% of the sample rating personhood at 9 which was the highest possible score ($M = 6.92, SD = 1.92$). Similarly, 78.9% of participants rated the severity of pregnancy loss as a minimum of 6 out of 9 ($M = 7.87, SD = 2.34$). Participants reported mean scores of $50.48 (SD = 22.76)$ on the PTGI total score, which is a moderate level, and reported that in the past two weeks they had engaged in deliberate rumination ($M = 13.92, SD = 9.3$). Participants’ mean scores on the DDI were $M = 37.90 (SD = 11.9)$ and $M = 41.31 (SD = 12.91)$ on the SRQ composite scale. Significant positive correlations were found between the PTG and the three main study variables: disclosure ($r = .17, p = .01$), deliberate rumination ($r = .42, p < .001$), and positive social reactions ($r = .36, p < .001$). Significant positive correlations were found between PTG and perceived personhood related to pregnancy ($r = .31, p < .001$) as well as perceived level of severity of the experience ($r = .19, p = .004$). Deliberate rumination was correlated with positive social reactions ($r = .22, p < .001$) and disclosure ($r = .15, p = .03$). See Table 1 for means and correlations of main study variables.

Multiple Regression Analysis

Disclosure and PTG

A hierarchical regression was conducted to test the first hypothesis, that disclosure would be a positive significant predictor of global PTG when controlling for loss context factors. The PTG was used as the outcome variable. Loss context variables including
time since loss, personhood, and trauma were entered in the first step and self-disclosure was entered in the second step. The results showed that the loss context variables explained 10.3% of the variance in the PTG, $F(3, 219) = 8.26, p < .001$. The addition of self-disclosure improved the prediction, with the final model explaining 12.2% of the variance ($R = .35, R^2 = .12, R^2$ change $= .02, F(4, 218) = 7.48, p < .001$). Self-disclosure and perceived personhood were significant predictors in the model ($\beta = .14, p = .03, 95\%CI [.02, .51]$ and $\beta = .26, p < .001, 95\%CI [1.12, 3.86]$ respectively); greater disclosure was associated with greater PTG, providing support for the first hypothesis, that disclosure would be a positive significant predictor of global PTG when controlling for loss context factors. See Table 2 for model summaries and regression coefficients.

**Disclosure and Deliberate Rumination**

Hierarchical regression was conducted to test the second part of the first hypothesis, that disclosure would be a positive significant predictor of deliberate rumination when controlling for loss context factors. The deliberate rumination was used as the outcome variable. Loss context variables including time since loss, personhood, and trauma were entered in the first step and self-disclosure was entered in the second step. The results showed that the loss context variables explained 12.4% of the variance in the deliberate rumination, $F(3, 222) = 10.32, p < .001$. The addition of self-disclosure improved the prediction, with the final model explaining 13.6% of the variance ($R = .37, R^2 = .14, R^2$ change $= .01, F(4, 222) = 8.57, p < .001$). Self-disclosure was not a significant predictor in the model, providing lack of support for the first hypothesis, that disclosure would be a positive significant predictor of deliberate rumination when controlling for loss context factors. See Table 3 for model summaries and regression
coefficients.

**Mediation Analysis**

**Deliberate Rumination as Mediator**

A mediation analysis was conducted to test the second hypothesis that the deliberate rumination will mediate the relationship between self-disclosure and PTG. PTG was entered as the outcome variable, self-disclosure was entered as a predictor, and deliberate rumination was entered as the mediator. The following variables were included as covariates: time since loss, perceived personhood, and severity of trauma. The overall regression model accounted for 13.7% of the variation in posttraumatic growth, $R^2 = .14$, $F(5,208) = 6.62, p < .001$. The unstandardized indirect effect coefficient indicated that deliberate rumination mediated the relationship between the self-disclosure and PTG, $b = .11$, 95% CI [.02 -.22] providing support for the second hypothesis (See Figure 1).

**Moderated Mediation Analysis**

A moderated mediation analysis was conducted to test the third hypothesis that positive social reactions to disclosure will moderate the indirect path (via deliberate rumination) and direct path from self-disclosure to PTG. For this analysis, PTG was entered as the outcome variable, self-disclosure as a predictor, deliberate rumination as the mediator and positive social reactions as moderator. The index of moderated mediation was not significant (95%CI [-.009, .006]), indicating that positive social reactions did not moderate the indirect path (via deliberate rumination) and direct path from self-disclosure to PTG, providing lack of support for the third hypothesis.

**Post Hoc Analysis**

The results of the moderated mediation analysis conducted to explore the third
hypothesis showed that the positive social reaction was not a moderator, hence providing no support for the hypothesis. Therefore, additional analyses were performed to explore whether positive social reactions may act as a predictor of PTG and deliberate rumination as well as a mediator of the relationship between disclosure and PTG

**Social Reactions and PTG**

A hierarchical regression was conducted to test whether positive social reactions would be a positive significant predictor of global PTG when controlling for loss context factors. The PTG was used as the outcome variable. The loss context variables of time since loss, personhood, and trauma were entered in the first step and the positive social reactions was entered in the second step. The results showed that the loss context variables explained 10.3% of the variance in the PTG, $F(3, 219) = 8.26, p < .001$. The addition of the positive social reactions improved the prediction, with the final model explaining 20.8% of the variance ($R = .46, R^2 = .21, R^2$ change = .10, $F(4, 219) = 14.08, p < .001$). Positive social reactions and personhood were significant predictors in the model ($\beta = .33, p < .001, 95\% CI [.37, .80]$ and $\beta = .24, p < .001, 95\% CI [1.11, 3.63]$ respectively); more positive social reactions were associated with greater PTG. See Table 4 for model summaries and regression coefficients.

**Social Reactions and Deliberate Rumination**

A hierarchical regression was conducted to test whether positive social reactions would be a positive significant predictor of deliberate rumination (controlling for loss context factors). The deliberate rumination was used as the outcome variable. Loss context variables such as time since loss, personhood, and trauma were entered in the first step and the positive social reactions were entered in the second step. The results showed
that the loss context variables explained 12.4% of the variance in the deliberate
rumination score, $F(3, 222) = 10.32, p < .001$. The addition of the positive social
reactions improved the prediction, with the final model explaining 14.6% of the variance
($R = .38, R^2 = .15, R^2$ change = .02, $F(4, 222) = 9.33, p < .001$). Positive social reactions
was a significant predictor in the model ($\beta = .15$, $p = .02$, 95%CI [.02, .20]); more
positive social reactions were associated with greater PTG. See Table 5 for model
summaries and regression coefficients.

**Deliberate Rumination as a Mediator**

A mediation analysis was conducted where PTG was entered as the outcome
variable, positive social reactions were entered as a predictor, and deliberate rumination
was entered as the mediator. The following variables were included as covariates: time
since loss, and sexual orientation. The overall regression model accounted for 13.7% of
the variation in posttraumatic growth, $R^2 = .14, F(3,214) = 11.34, p < .001$. The
unstandardized indirect effect coefficient indicated that deliberate rumination mediated
the relationship between positive social reactions and PTG, $b = .15$, 95% CI [.05 - .27]
(See Figure 2).

**Social Reactions as Mediator**

A mediation analysis was conducted where deliberate rumination was entered as the
outcome variable, self-disclosure as a predictor, and positive social reactions were
entered as the mediator. The following variables were included as covariates: time
since loss and sexual orientation. The overall regression model accounted for .6% of the
variation in deliberate rumination, $R^2 = .06, F(3,217) = 4.94, p = .002$. The unstandardized
indirect effect coefficient indicated that positive social reactions mediated the relationship
between self-disclosure and deliberate rumination, \( b = .03, 95\% \text{ CI [.004, .06]} \) (See Figure 3).

**Discussion**

The purpose of this study was to address a gap in the literature and investigate the relationship between self-disclosure, positive social reactions, rumination and PTG. Based on available research, the current study hypothesized that self-disclosure would be a positive significant predictor of deliberate rumination and PTG, that deliberate rumination would mediate the relationship between self-disclosure and PTG and that the relationship between disclosure and rumination would be moderated by positive social reactions.

Participants reported that in the past two weeks they engaged in deliberate rumination and showed moderate levels of PTG, which is consistent with previous research regarding women who have experienced miscarriage (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). Positive correlations were found between women’s tendency to disclose personally distressing information, positive social reactions they have received following miscarriage, and their reported levels of PTG. The hierarchical regression findings indicated that disclosure was a significant predictor of global PTG. Greater disclosure was associated with higher levels of PTG following pregnancy loss which is consistent with available literature (Dong et al., 2015; Stockton et al., 2014). This finding provides additional evidence that the act of disclosing distressing information may be an important factor contributing to individuals’ experience of PTG.
Surprisingly, disclosure was not a significant predictor of deliberate rumination. Previous research has found that the benefits and costs of disclosure depend on a confidant’s expected or actual supportive response to a disclosure (Checton & Greene, 2012). Effective social support can help people reframe a stressor, which can improve their emotional state and instill hope in stressful situations (Jones & Wirtz, 2006). Therefore, it is possible that disclosure following pregnancy loss is not enough to help individual reframe the stressor, engage in meaning making and experience growth.

The mediation analysis provided support for the second hypothesis that the relationship between disclosure and PTG would be mediated by rumination. This finding is consistent with the PTG theory, which proposes that disclosing one’s trauma and distress may foster changes in cognitive processing. Engaging in reflective, meaning-making repetitive thought may aid in making accommodations to the new assumptive world or assimilating the event into an existing cognitive structure, and hence contribute to the experience of psychological growth (Tedeschi et al., 2018). It is important to note that only 13.7% of variance was explained by this model, suggesting that there may be other variables that contribute to women’s growth following pregnancy loss such as ability to manage emotional distress and coping, ability to engage in self-analysis (e.g. reflecting, writing, praying), the circumstances surrounding the pregnancy, or any sociocultural influences such as having access to role models that can support schema change (Tedeschi et al., 2018).

Contrary to the third hypothesis, there was no moderated mediation between disclosure and rumination, suggesting that the relationship between disclosure and rumination is not dependent on the level of positive social reactions women receive.
following the disclosure. Similarly, the relationship between women’s disclosure of personally distressing information and PTG did not change based on a specific level of social disclosure. Several post hoc analyses were conducted to explore the relationship between positive social reactions and the main study variables. There was a significant positive relationship between social reactions, deliberate rumination, and PTG. Hierarchical regression findings indicated that including positive social reactions as a predictor of global PTG explained more variance in the model compared to the model with only disclosure and loss context factors. This finding suggests that not only the disclosure of personally distressing information but also the response women receive following the disclosure of pregnancy loss is related to their positive post loss adjustment, which is in line with previous research (Taku et al., 2009; Ullman, 2014).

**Clinical Implications**

The current study has several implications for health care and mental health care providers who work with women who have experienced miscarriage. Health care providers are often the first individuals with whom women have contact following miscarriage. Researchers have previously suggested that the experiences women have with health care professionals can influence their distress levels following loss (Bellhouse et al., 2019). Providing women space to discuss their experiences and express their grief and loss rather than solely focusing on the medical management of the miscarriage may be beneficial in women’s post loss adjustment. Moreover, validating and acknowledging women’s distress and encouraging further disclosure by providing referrals to support services, including mental health referrals, can make the encounter with healthcare providers following the loss more positive (Bellhouse et al., 2019) and foster growth.
Clinicians should assess women’s comfort level associated with disclosing their experiences of loss and whether they have communicated their thoughts and feelings related to miscarriage with others. Given the current and previous findings, clinicians should encourage women to disclose their experiences through discussion, journaling, or expressing their emotions through various art forms. Clinicians may want to help clients discover the possible meaning of their experience through engaging in deliberate, reflective types of thinking that may facilitate positive psychological change. Discovering new meaning in life and finding a new sense of purpose may, in turn, lead to a higher level of psychological well-being, indicating the importance of growth (Triplett et al., 2012).

These findings also indicate that how others respond to women’s disclosure matters in their positive post loss adjustment. Therefore, continuing efforts to break the stigma associated with pregnancy loss through education of the general public regarding the commonality of pregnancy loss and the psychological toll it can take on women are needed. Counselor educators should include topics related to reproductive trauma (e.g., miscarriage, stillbirth, infertility, and birth trauma) in their curriculum to increase counselor’s in training competency. Specialized courses focused on adult trauma and grief as well as core courses that discuss psychopathology, human growth and development or assessment could include a discussion on what reproductive trauma is, its impact on individuals and families functioning, as well as approaches to assessment and treatment. Additionally, discussing common clinical errors that counselors make and how they can affect the therapeutic relationship and treatment outcome (Markin, 2016) may decrease the incidence of such errors and improve the services provided to this
population. In terms of specific in class activities, assigning students to research and reflect on the reproductive history of their family and narratives surrounding it can increase student’s self-awareness as well as potentially increase their understanding of commonality of reproductive issues.

**Limitations**

There are several limitations of this study that restrict its generalizability and implications. The sample consisted of predominately white women \((n = 187; 82.4\%)\) who had a bachelor’s degree, master’s degree, or doctoral degree \((n = 135, 59.5\%)\); therefore, the generalizability of these findings to racially, and educationally diverse populations is limited. This study relied on retrospective methods of self-report which could be limited by participants’ ability to accurately recall the reactions to their disclosure of miscarriage at the time of loss. This study only explored participants’ current rumination, therefore changes in rumination patterns cannot be inferred from the current data.

An additional limitation of this study was the use of the DDI, a measure used to assess individuals’ tendency to disclose personally distressing information across time and situations, not miscarriage specifically. This measure was used with women who have experienced pregnancy loss for the first time in this study.

A final limitation of this study is that it used a correlational, cross-sectional design; therefore, causality cannot be inferred. Also, it is possible that the relationship between variables is not linear; this was not detectable via this study’s design and method of analysis.

**Future Research**

Based on the limitations of this study, future research should include a more
diverse sample to reflect experiences of individual’s who do not identify as white and as having a high socioeconomic status. Specifically, future research should focus on women of color who experience pregnancy and infant loss at higher rates compared to white women (Mukherjee et al., 2013) yet their experiences have rarely been explored in the literature.

Future research should further investigate the type of disclosure that is contributing to women’s willingness to engage in deliberate, reflective rumination and their experiences of growth. Investigating the type of person to whom women first disclosed (e.g. partner, friend, family member), how many individuals women shared their miscarriage news with, the timing of the disclosure, as well as reactions to the disclosure can inform more specific recommendations to help women with the management of a miscarriage and the decision of whether they should or should not share their loss with others. Given that individuals use social media to disclose their miscarriage news, the effects of such disclosure and the differences between in person versus online discussion of loss should be further explored (Mercier et al., 2020).

This study focused exclusively on the relationship between disclosure and positive psychological outcomes. Future studies should explore the differential impact disclosure may have on an individual’s adjustment and experience of PTG and PTSD following pregnancy loss. A meta-analytical review of 42 studies that aimed to clarify the relationship between PTG and PTSD concluded that PTG and PTSD symptoms are positively and linearly correlated, indicating that they are not on opposite ends of a single dimension (Shakespeare-Finch & Lurie-Beck, 2014). PTG is conceptualized as positive but transformational change that may be driven by the same set of factors that lead to
PTSD symptoms (i.e. rumination), and it is not the same as a decrease in PTSD symptoms (Tedeshi & Calhoun, 2004). Therefore, further clarifying the factors that play a role in the development of PTG and PTSD and exploring the likely curvilinear relationship between the two post trauma outcomes may be an important future research avenue.

**Conclusion**

This study contributes to the limited literature focused on the relationship between women’s disclosure, social reactions to the disclosure, deliberate rumination and positive psychological outcomes following miscarriage. Findings suggest that deliberate rumination mediates the relationship between disclosure and PTG. Moreover, positive social reactions to disclosure may be an important factor in women’s experiences of growth following pregnancy loss. The current study adds to an understanding of the importance of discussing experiences of miscarriage with others, a topic that may be considered taboo (Markin & Zilcha-Mano, 2018). Based on the current findings, it is important for providers to give women space to express their thoughts and feelings associated with the loss and encourage engagement in reflective, meaning-making processes that can facilitate PTG. Future research is needed to further explore the specific types of disclosure and its differential impact on women’s mental health following miscarriage.
Pregnancy loss can be a devastating and traumatic event that can negatively impact a woman's mental health (Krosh & Shakespeare-Finch, 2017). However, focusing solely on psychological distress following trauma negates the positive psychological changes that can occur as a result of suffering. There is growing research recognizing the importance of investigating positive post-loss outcomes such as posttraumatic growth (PTG). PTG can be defined as an experience of “positive psychological change” (Calhoun & Tedeschi, 2001, p. 157) when struggling with a devastating and life-altering event (Tedeschi et al., 2018). The experience of PTG occurs in the relational context where individuals share their feelings, listen and together process traumatic events (Lindstrom et al., 2013; Taku et al., 2009). Experiencing an increased sense of compassion and a stronger connectedness to the community through participation in prosocial behavior can be an example of PTG (Tedeschi et al., 2018). However, prosocial correlates have been under-researched in the literature in general and in perinatal loss literature specifically (El Gabalway, 2020). The available literature shows that engaging in volunteer work may foster the construction of meaning and has been positively related to self-reported PTG following stillbirth (Cacciatore et al., 2018). The current study aims to explore the relationship between prosocial behaviors, empathy, and PTG in women who have experienced pregnancy loss.

Pregnancy Loss and Social Isolation
Social support is considered to be one of the main factors contributing to positive adjustment following a traumatic event (Prati & Pietrantoni, 2009). Having a network of individuals that can offer emotional and behavioral support has been associated with a decrease in negative mental health outcomes (Juth et al., 2015; Kawachi & Berkman, 2001) and fostering of positive psychological changes (Dong et al., 2017; Sattler et al., 2014; Yu et al., 2014). However, factors such as misinformation in the general public regarding the prevalence and causes of pregnancy loss (Bardos et al., 2015), social constraints placed on the grieving process (Lang et al., 2011), and continued social stigma surrounding the topic of pregnancy loss (Brierley-Jones et al., 2015; Markin & Zilcha-Mano, 2018) can impact the type and amount of social support women receive. Well-intended social support can sometimes be paradoxically detrimental to an individual's mental health outcomes and overall well-being following pregnancy loss (Meyer, 2016).

In the U.S. pregnancy loss is a common event with 10-15% of recognized pregnancies resulting in miscarriage (March of Dimes, 2020a) and 1 in 100 pregnancies resulting in stillbirth (March of Dimes, 2020b). Despite the high prevalence of the event, the general public perceives pregnancy loss to be a rare complication of pregnancy (Bardos et al., 2015). This perception by the general public may foster the alienation that women feel as they experience pregnancy loss (Bardos et al., 2015). Moreover, the general public has erroneous beliefs regarding the causes and outcomes of pregnancy loss, which can place a false sense of responsibility on women that can contribute to feelings of guilt and shame (Bardos et al., 2015). Feelings of shame and guilt can act as a
barrier, reducing women’s willingness to self-disclose their loss and seek social support (Bellhouse et al., 2018).

Even though individuals who experience pregnancy loss report levels of grief comparable to those occurring after the death of a relative (Zeanah et al., 1995), women who experience pregnancy loss may not receive the same social recognition for their loss (Burden et al., 2016). Bereaved women’s expressions of grief may be met with comments that minimize and deny their experiences (Markin, 2017). Consequently, one could apply Doka's (1989) concept of disenfranchised grief, which is defined as “the experience of loss, not openly acknowledged, publicly mourned, or socially supported” (Markin, 2017, p.367).

The reported by women feeling of stigmatization and rejection following pregnancy loss (Burden et al, 2016) may contribute to women limited and transient experiences of positive social support after the loss. Rowland and Lee (2010) who qualitatively explored women’s experiences following pregnancy loss concluded that participants “expectations that family members, in particular partners, would offer unconditional support were sometimes not met” (p. 283) and that such “lack of emotional support from family members and friends meant that women often felt unable to grieve in their own way” (p. 283). Negative social interactions that increase women's sense of isolation can contribute to negative post-loss adjustment by decreasing self-esteem and one’s sense of control (Cohen, 2004).

Finding Social Support Following Pregnancy Loss

As women's typical social support networks may not be meeting their post-loss needs, women may turn to online resources for information and support. Social media
can play a critical role in providing women with accessible positive support systems that aid in decreasing their feelings of grief and loss. It has been suggested that social media may offer an avenue for which disenfranchised grief can be validated and a desire for additional information on pregnancy loss can be satisfied (Cesare et al., 2020). Recent research provides some support for this theory.

A study by Mercier and colleagues (2020) analyzed 200 Instagram posts that used “I had miscarriage” hashtag extracted on five randomly selected days. Each post was coded and through an iterative process five overarching themes surfaced which included a theme called “social experiences of miscarriage” (Mercier et al., 2020, p.168). The most common code under that theme was focused on how sharing or disclosing one’s miscarriage on social media was an attempt to seek support and offer solidarity to others (Mercier et al., 2020). Moreover, several of the posts described interactions with family and friends that social media users found insensitive and hurtful (Mercier et al., 2020). Study by Alqassim and colleagues (2019) found that for 62.5% of women in their sample Facebook was a key source of emotional support following pregnancy loss. Women in that sample reported that they used Facebook to notify their social networks about their miscarriage, as a coping tool to manage their negative emotions after miscarriage, and to educate others and raise awareness about the pain of the miscarriage (Alqassim et al., 2019). Therefore, sharing on social media may fill the gap in the experiences of social support and provide a space for women to disclose miscarriage events, memorialize a lost pregnancy and offer support to others who are going through pregnancy loss (Alqassim et al., 2019, Mercier et al., 2020).
In addition to social media, there is a wide range of online support websites available. However, there is limited research investigating the role of internet support groups that connect participants through online groups, forums or communities. In the study by Gold and colleagues (2012), 78% (n = 601) of women reported that the internet support groups helped them feel less isolated and illuminated the universality of their grief experience. Participants (29%, n = 247) found the online boards a validating environment where it was acceptable to discuss their experiences of pregnancy loss (Gold et al., 2012). Women (11%, n = 82) also found the online environment less threatening compared to in person interactions, as they are able to hide their vulnerability behind the screen and not worry about immediate judgement (Gold et al., 2012). Therefore, internet support groups may provide an emotionally safer environment for women sensitive to the stigma encountered in a face-to-face social situation.

Moreover, in person support can have a positive impact on individual’s post-loss journey. Qualitative research findings describe that some women found the support they have received from others who have also experienced pregnancy loss to be “the most valuable” (p. 278) as they had a good understanding of what they were going through and what their needs were (Rowlands & Lee, 2010). Moreover, support groups composed of individuals who have experienced similar losses can foster a sense of community for the bereaved and may decrease the negative impact of the pregnancy loss in the form of reduced traumatic stress symptoms (Cacciatore, 2007). Groups can be beneficial not only during the acute crisis but also can be beneficial to some women years after the loss of their child. In Cacciatore (2007), study participants who continued to be engaged in groups years after their loss compared to those who have not, reported increased levels of
compassion toward others, became more involved in helping others and wanted to instill social change to make a difference for others. Similarly, Burden and colleagues (2016) found that stillbirth motivated parents to engage in healthcare improvements, providing peer support and increasing public awareness. Therefore, the gap in the interpersonal systems of support for women who have experienced pregnancy loss may act as catalysis for wanting to be an agent of change and engage in prosocial behavior which can be understood as an aspect of posttraumatic growth.

**Empathy, Prosocial Behavior, and Posttraumatic Growth**

PTG focuses on long-term, transformative changes that individuals experience after a traumatic event (Tedeschi et al., 2018). The PTG model assumes that for growth to occur, individuals have to experience a traumatic event that shatters their assumptive world view. Such a challenge evokes an internal struggle between a person’s previous understanding of the world and new perceptions resulting from the traumatic event. The ensuing cognitive struggle with traumatic circumstances plays a key role in PTG and may serve as a trigger toward personal growth and positive change (Tedeschi et al., 2018). The theory further suggests that the PTG process and outcome can be significantly impacted by the social support an individual receives. Being able to discuss one's traumatic event with others can change the nature of individuals’ repetitive thoughts from intrusive to more deliberate and reflective, bringing them closer to making meaning and accepting the change in their world (Tedeschi et al., 2018). As a result of going through this process of rumination and finding new ways of coping, individuals can experience PTG and develop a stronger sense of connectedness to others through a newly found sense of compassion (Shakespeare-Finch & Copping, 2006). For example, people who
receive emotional or instrumental support from others may use the opportunity to reflect on their own experiences and may share them with others (Tedeschi et al., 2018).

Scholars of PTG identified compassion, empathy, and altruism as likely aspects of PTG (Janoff-Bulman, 1992; Tedeschi et al., 1998). Tedeschi and colleagues (1998) posited that some types of trauma may act as “empathy training” (p.12). Being able to recognize one's vulnerability can make individuals feel more compassionate toward others (Tedeschi et al., 1998). In turn, having a focus beyond self can be an important factor contributing to prosocial behavior (El-Gabalawy, 2010). Therefore, it is theorized that if PTG makes people behave in more prosocial ways it may be because people who experience PTG are more likely to empathize with others (Tedeschi et al., 1998).

Limited research supports the connection between empathy, prosocial behavior, and PTG. PTG has been related to an increase in other-oriented behavior such as spending more time with friends and family, being willing to help others, and increased altruism (El-Gabalawy, 2010; Shakespeare-Finch et al., 2012). Empathy has been shown to mediate the relationship between PTG and several prosocial orientation outcomes including volunteer frequency and helping behavior (El-Gabalawy, 2010). More recently, empathy and prosocial behaviors such as volunteering have been associated with PTG which indicates that PTG is related to more than individual benefits alone, and extends to altruism (El-Gabalawy et al., 2020).

Despite the rise in research investigating the relationship between trauma and PTG, few studies have considered the extent to which positive transformation occurs following pregnancy loss. The available literature shows that women experience moderate levels of PTG following pregnancy loss (Freedle & Kashubeck-West, 2020;
Krosch & Shakespeare-Finch, 2017). Research indicated that core belief challenge was related to PTG (Krosch & Shakespeare-Finch, 2017) and that rumination can act as a mediator between core belief challenge and PTG (Freedle & Kashubeck-West, 2020) as well as grief and PTG (Lafarge et al., 2019). However, understanding increased levels of compassion as outcomes of PTG and mechanisms of such change have been understudied in women who have experienced pregnancy loss.

To date, there is only one study that has investigated the relationship between prosocial behavior and posttraumatic growth in women who have experienced pregnancy loss (Cacciatore et al., 2018). The study used a mixed-methods design and found that 38 out of 72 coded statements (52%) indicated that women engaged in volunteering as a way to incite change in the unsupportive interpersonal relationships they experienced following their pregnancy loss. Researchers indicated that prosocial helping behaviors “fostered the meaning-construal and positively related to self-reported PTG” (Cacciatore et al., 2018, p.33) following stillbirth. Therefore, engaging in activism and service may help women confront the stigma and invalidation currently associated with pregnancy loss (Cacciatore et al., 2018).

**Current Study**

The purpose of this study was to investigate the relationships between empathy, prosocial behavior, and PTG in women who have experienced pregnancy loss. Available research indicated that bereaved women engaged in prosocial behavior as a way to combat the negative social support experiences they had post-loss and that such behavior was associated with increased levels of PTG (Cacciatore et al., 2018). The mechanisms for increased prosocial behavior and PTG have not been tested in women who have
experienced miscarriage or stillbirth. Previous studies indicated that empathy mediates the relationship between PTG and prosocial behaviors (El-Gabalawy, 2010). Continuing to understand the mechanisms behind helping others after a period of trauma is crucial to finding ways to promote such behavior and ascertaining its positive impact on an individual's post-loss adjustment. This study hypothesizes that: 1) women who engage in prosocial behavior following pregnancy loss will show higher levels of empathy and PTG compared to those who do not, and 2) the relationship between PTG and prosocial behavior will be mediated by empathy.

**Methods**

**Participants**

The final sample was comprised of women \( n = 291 \) who experienced either miscarriage defined as loss of pregnancy before 20 weeks gestation \( n = 234, 80.4\% \), stillbirth defined as baby born without signs of life after 20 weeks gestation \( n = 24, 8.2\% \); or both \( n = 33, 11.3\% \). Participants were predominately White \( n = 237; 81.4\% \), and reported high socioeconomic status with 58.7% reported being well educated (bachelor’s degree or higher \( n = 171 \), 53.3% being employed on a full-time basis \( n = 156 \) and 50.2% reported being a part of middle class \( n = 146, 50.2\% \). Majority of the participants identified as heterosexual \( n = 255, 87.6\% \) and married \( n = 233, 80.1\% \). Mean age of the participants was 32.50 years \( SD = 6.83, \text{ range 18-58} \).

Slightly more women reported single \( n = 148, 50.9\% \) versus multiple pregnancy losses \( n = 143, 49.1\% \). Participants reported experiencing a range of 1 to 12 pregnancy losses, with a mean of 2.15 \( SD = 1.73 \) losses. Among the participants, the most recent pregnancy loss occurred on average 3.18 \( SD = 3.96 \) years ago, with timing of loss
ranging from less than a month ago to 25 years ago, and the mean gestation weeks at the
time of the first loss was 11.51 (SD = 7.76). The majority of the sample reported that they
had living children (n = 207, 71.1%) and the timing of loss was split between having the
loss before living children (n = 75, 25.8%), after (n = 71, 24.4%) or both (n = 61, 21%).
A small percentage of all reported pregnancy losses were associated with fertility
treatment (n = 38, 13.1%).

**Procedure**

Participants were recruited using convenience and snowball sampling methods.
The recruitment strategy included creating an advertisement that ran on two social media
platforms (i.e. Facebook and Instagram). The ad targeted women aged 18 to 45, meaning
that the information regarding the study was shown to all Facebook or Instagram users
who fit that demographic. The invitation to participate in the study was also posted on
researcher’s social media accounts as well as online websites (e.g., Reddit). From the
researchers social media account, the invitation was shared 15 times. Further shares were
not tracked.

To be eligible to participate, individuals had to be over 18 years old, have
experienced pregnancy loss defined as either miscarriage (loss of a pregnancy before 20
weeks gestation), or stillbirth (baby born without signs of life after 20 weeks gestation).
Participants who self-identified with the eligibility criteria and clicked the continue
button signifying their consent to participate in the study where asked to complete an
online survey. At the end of the survey the study purpose was reiterated and a list of
mental health resources and supports available was provided in case the survey questions
were emotionally disturbing. Additionally, upon completion of the survey, participants
were asked if they would like to enter a drawing to receive a gift card. This survey was not linked in any way with participants’ previous responses and appeared whether or not participants answer all of the questions. The gift cards winners were contacted individually by the researcher. Participation was voluntary and confidential. The study was approved by University of Missouri-St. Louis Institutional Review Board.

Initially, 464 participants started the online survey; 308 people completed the survey. The 33.6% dropout rate included 48 participants who opened the survey but have not answered any questions, two participants who did not consent to take part in the survey and three participants who did not meet the eligibility criteria and were automatically removed from the survey by Qualtrics. The remaining drop out ($n = 90$) was likely due to the survey length. Two participants were excluded from the analysis for reporting that they were born male, two for being from outside of the U.S., and six for reporting their pregnancy loss was not a traumatic event (score of 0). An additional six participants were excluded for being univariate outliers, defined as those scoring more than 3.29 standard deviations from the mean on the main study variables, and one for being multivariate outlier, Mahalanobis distance score was higher than the critical value of 16.81.

**Measures**

*Demographic Questionnaire and Loss Context Factors*

Demographic information collected included current age, ethnicity, educational level, employment status, current income, and relationship status. Loss context factors were assessed and included the type of loss, the number of pregnancy losses, time since the loss(es), gestational age of the baby or fetus at the time of loss(es), and whether
participants have had living children. Participants were asked to rate the severity of their pregnancy loss experience from 0 (not traumatic) to 9 (very severely traumatic) based on the provided definition of a traumatic event that is consistent with the conceptualization of trauma in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.) (APA, 2013). This question has been previously used in trauma research to control for trauma severity (e.g., Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017).

The perceived personhood related to pregnancy was assessed by a 10-point Likert-type scale (0 not at all to 9 very great degree) indicating the degree to which participants believed their baby or pregnancy was a person (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017).

**Prosocial Behavior**

Prosocial behavior was defined as either volunteering in any in-person capacity or posting content online that is meant to benefit women who have experienced pregnancy loss. Specifically, women were asked “Since your pregnancy loss, have you volunteered at an organization that supports individuals who have experienced pregnancy loss (e.g. help organize a walk/run, lead a support group, organize a fundraiser)?” to determine if they have volunteered in-person and “Since your pregnancy loss have you posted information or comments online that were meant to support individuals who have experienced pregnancy loss (e.g. leaving positive comments on other’s pregnancy loss announcements, making blog entries that provide information and support)?” to determine if they have volunteered online.

Women were asked about the type of volunteering they engage in, its duration and frequency (See Appendix J). Prior research has assessed volunteering similarly (e.g., El-
Gabalawy, 2010). It is noteworthy that volunteer activity has been found to correlate with the Prosocial Personality Battery (Penner, 2002) indicating similarities in these constructs (El-Gabalawy, 2020). In the current sample, frequency and duration of volunteering was correlated ($r = .72$ for in person volunteering and $r = .46$ for online volunteering), showing evidence of convergent validity. Volunteering frequency and duration was not correlated with employment status, education level, or experience of social class providing evidence for divergent validity.

**Empathy**

Empathy was measured using the Interpersonal Reactivity Inventory (IRI; Davis, 1983). The IRI is a 28-item self-report measure that assesses four dimensions of empathy including: 1) Empathic Concern, a tendency to feel sympathy, compassion, concern for others (e.g., “I often have tender, concerned feelings for people less fortunate than me”); 2) Perspective Taking, the ability to take another’s point of view (e.g., “I sometimes try to understand my friends better by imagining how things look from their perspective”); 3) Fantasy, a tendency to identify with characters in fictional works (e.g., “I really get involved with the feelings of the characters in a novel”) and; 4) Personal Distress, a tendency to become upset and anxious when observing others in negative circumstances (e.g., “Being in a tense emotional situation scares me”). Each subscale consists of 7 items answered on a 5-point Likert scale ranging from 0 (*does not describe me well*) to 4 (*describes me very well*). The measure and subscales have shown good validity and reliability. The subscales have shown good internal consistency in a sample of college students who experienced trauma ($\alpha = .80 - .84$; El-Gabalway et al., 2020). For the purpose of this study only the total score was used in the analysis. The reliability analysis
showed $\alpha = .65$ for the total scale in the current sample. Based on the item analysis two items were removed to improve the scales reliability, item #4 “Sometimes I don't feel very sorry for other people when they are having problems” and item #12 “Becoming extremely involved in a good book or movie is somewhat rare for me”. After removing the two items the Cronbach alpha for the current sample was .73.

**Posttraumatic Growth**

Posttraumatic growth was measured using the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), a 21-item measure of positive changes that may be experienced in the aftermath of trauma. Participants rated the occurrence of personal changes they experienced following their pregnancy loss from 0 (*not at all*) to 5 (*a very great degree*). The PTGI yields a total score of posttraumatic growth as well as scores for five dimensions: Relating to Others, New Possibilities, Personal Strength, Spiritual Change, and Appreciation of Life. For the purpose of this study only the PTGI total score was used in the analysis. The PTGI showed excellent internal consistency in a sample of women who experienced pregnancy loss ($\alpha = .92$, Krosch & Shakespeare-Finch, 2017) and acceptable test-retest reliability over two months ($r = .71$; Tedeschi & Calhoun, 1996). Factor analyses confirmed the five-factor structure of the PTGI (Morris et al., 2005). The Cronbach alpha in the current sample was .93.

**Data Analysis**

Descriptive statistics were calculated to investigate rates of prosocial behavior, empathy, and posttraumatic growth as well as to explore the sample’s demographic information. Moreover, bivariate correlations using Pearson's correlation coefficient were conducted to examine whether demographic factors, loss context factors, empathy
and prosocial behavior correlated to PTG. One way between-groups ANOVA with post-hoc tests was conducted to compare PTG levels between women who have experienced stillbirth, miscarriage or both.

Before conducting regression and mediation analyses, the data was checked for: univariate outliers using z-scores; multivariate outliers using Mahalanobis Distance; multicollinearity using Person’s correlation coefficient; linearity using a scatterplot matrix, homoscedasticity using Levene’s test for equality of variances and normally distributed errors using Q-Q plots of residuals. All assumptions of regression were met. A missing values analysis was conducted to determine any patterns in the missing data. Less than 5% of the data was missing, and missing data were missing completely at random (MCAR) meaning that no systematic differences exist between participants with missing data and those with complete data. Therefore, available case analysis was utilized (Parent, 2013).

The first hypothesis regarding engagement in prosocial behavior and higher levels of empathy and PTG was tested using analysis of variance. A one-way ANCOVA was conducted to test whether there were group differences in levels of PTG. Participants were divided into two groups: individuals who have reported volunteering following pregnancy loss and those who have not. The dependent variable in the ANCOVA analysis was the PTG (Tedeschi & Calhoun, 1996). Demographic and loss context factors that were correlated with the dependent variables were entered as covariates. A one-way ANOVA was conducted to test whether there were group differences in rates of empathy. The same groups were explored as in the ANCOVA. An ANOVA analysis was
performed rather than ANCOVA as there were no demographic or loss context factors that were correlated with the empathy variable.

The second hypothesis that the relationship between PTG and prosocial behavior would be mediated by empathy was tested using mediation analysis. Mediation analysis was used to investigate whether empathy mediates the relationship between prosocial behaviors and PTG. Hayes’s (2014) PROCESS macro for SPSS (version 25) was employed to estimate the path coefficients in the mediation model. PTG was entered as the predictor, empathy was entered as the mediator and prosocial behavior was entered as the outcome variable. For inference about the significance of indirect effects and conditional indirect effects (i.e. mediation), PROCESS produces bias-corrected bootstrap confidence intervals based on a designated number of bootstrap samples. An effect is significant when zero is not contained within the confidence interval. A bootstrap methodology using 5,000 samples with 95% confidence intervals was utilized to calculate the indirect effect.

Results

The majority of the participants rated the severity of pregnancy loss at a minimum of 6 out of 9 (80.7%, $M = 7.09$, $SD = 1.92$) and 75.6% of the participants rated perceived personhood of the pregnancy or fetus at 9 which was the highest possible score ($M = 8.00$, $SD = 2.15$). Participants had a mean total empathy score of 60.37 ($SD = 9.62$) and a mean total PTG score of 52.81 ($SD = 23.93$), which is a moderate score.

A small percentage of participants reported that they have volunteered at an organization that supports parents who have experienced pregnancy loss ($n = 40$, 13.7%). Of those who volunteered, most did so on an annual or semiannual basis ($n = 29$, 72.5%)
and have been volunteering for longer than 2 years \( (n = 25, 62.5\%) \). The types of volunteering activities that women reported that they have engaged in included: assisting with fundraising for a pregnancy loss awareness event such as a walk, volunteering at a neonatal unit, mentoring other parents, running an in-person support group or making memory objects for hospitals.

The majority of the participants reported that they have posted information or comments online that were meant to support parents who have experienced pregnancy loss \( (n = 215, 73.9\%) \). Of those who volunteered in this way, most did so on an annual or semiannual basis \( (n = 97, 45.1\%) \) and have been volunteering for longer than 2 years \( (n = 114, 53\%) \). Participants comments could be categorized as either supportive (e.g. offering condolences, leaving uplifting comments on other’s pregnancy loss anniversaries) or informative (e.g. sharing information about miscarriage, sharing links to organizations that can be of assistance). Women reported using the Facebook post feature as well as private messages to share and support others who have experienced pregnancy loss.

Significant positive correlations were found between PTG and the gestational age of the baby/fetus at the time of loss \( (r = .18, p < .01) \), perceived personhood related to pregnancy \( (r = .31, p < .01) \), perceived level of severity of the experience \( (r = .26, p < .01) \) and type of loss \( (r = .22, p < .01) \). Results of one way ANOVA indicated that there was a statistically significant difference in PTG levels for the three groups: miscarriage, stillbirth or both \( [F(2, 288) = 7.99, p < .001, \text{the effect size using eta squared was .05}] \). Post hoc comparisons using Tukey HSD test indicated that the PTG level reported by women who experienced stillbirth \( (M = 63.17, SD = 24.58) \) or miscarriage and stillbirth
were significantly higher compared to the level reported from women who experienced miscarriage only \((M = 50.12, SD = 23.43)\).

No demographic factors were correlated with PTG. Significant positive correlations were found between PTG and whether participants engaged in volunteering work in-person \((r = .19, p = .001)\), in-person volunteering frequency \((r = .19, p < .001)\), in-person volunteering duration \((r = .13, p = .02)\), and empathy \((r = .13, p = .02)\). The PTG was not correlated with frequency or duration of online volunteering. Empathy was not correlated with prosocial behaviors, demographic, or loss context factors. See Table 1 for correlations between PTG and the main study variables.

**Analysis of Variance**

**Prosocial Behavior and PTG**

To test the first hypothesis that women who engage in prosocial behavior following pregnancy loss will show higher levels of PTG compared to those who do not, a one-way between-groups analysis of covariance was conducted. The PTG was entered as the dependent variable. Loss context factors that were correlated with PTG such as gestational age of the baby or fetus at the time of loss, perceived personhood related to pregnancy, perceived level of severity of the experience and type of loss were used as covariates. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, linearity or homogeneity of regression slopes. After adjusting for loss context variables there was no significant difference in PTG between women who engaged in volunteering \((M = 53.49, SD = 23.26)\) compared to those who did not \([F(1, 286) = .02, p = .90, \text{partial eta squared} = .00, (M = 51.56, SD = 25.99)]\).
**Prosocial Behavior and Empathy**

To test the second part of the first hypothesis that women who engage in prosocial behavior following pregnancy loss will show higher levels of empathy compared to those who do not, a one-way between-groups analysis was conducted. The empathy was entered as the dependent variable. Since there were no variables that correlated with empathy, ANOVA rather than ANCOVA was performed. There was no significant difference between women who engaged in volunteering \( (M = 62.26, SD = 10.27) \) and those who did not \( [F(1, 285) = 2.64, p = .11, (M = 59.95, SD = 11.25)] \).

**Mediation Analysis**

**Prosocial behavior as mediator**

As the relationship between the main study variables of PTG, empathy, and prosocial behavior was small or insignificant, the mediation analysis was not performed to test the second hypothesis.

**Post Hoc Analysis**

To further understand the relationship between prosocial behaviors, PTG and empathy, three additional analysis of covariance and one analysis of variance were conducted. The first analysis explored whether there were differences in PTG levels in participants who volunteered in person compared to those who did not volunteer at all. The second analysis explored differences in PTG levels of participants who reported to volunteer only online versus those who reported volunteering online and in-person. The third analysis investigated PTG levels in different types of volunteering between women who had experienced miscarriage, stillbirth or both. The final post hoc analysis explored
the differences in empathy scores between participants who volunteered online only versus online and in-person

**Prosocial Behavior and PTG**

A one-way between-groups analysis of covariance was conducted to compare the PTG of women who engaged in in-person volunteer work following pregnancy loss and those who did not engage in volunteer work in-person. Participants who volunteered online were excluded from the analysis. The dependent variable was the PTG and loss context factors that were correlated with the PTG such as gestational age of the baby/fetus at the time of loss, perceived personhood related to pregnancy, perceived level of severity of the experience and type of loss were used as covariates in the analysis. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, linearity or homogeneity of regression slopes. After adjusting for loss context variables there was a significant difference between women who engaged in in-person volunteering ($M = 63.36, SD = 23.38$) and those who did not engage in any volunteering [$F(1, 281) = 4.31, p = .04$, partial eta squared = .02, $M = 51.40, SD = 23.66$].

Furthermore, differences between those who volunteered only online versus online and in-person were analyzed, as all participants who reported volunteering in-person also reported volunteering online. The dependent variable was the PTG and loss context factors that were correlated with the PTG such as gestational age of the baby/fetus at the time of loss, perceived personhood related to pregnancy, perceived level of severity of the experience and type of loss were used as covariates in the analysis. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, linearity or homogeneity of regression slopes. After adjusting
for loss context variables, there was a significant difference between women who
engaged in volunteering in-person and online \( (M = 63.36, SD = 23.38) \) versus online only
\[ F(1, 209) = 6.59, p = .01, \text{ partial } \eta^2 = .03, M = 51.29, SD = 22.72 \].

Additionally, differences in types of volunteering were explored between women
who had experienced miscarriage, stillbirth or both. An analysis of covariance was
performed. After adjusting for loss context variables, there was a significant difference in
in-person and online \( (M = 61.81, SD = 25.47) \) versus online volunteering \[ F(1, 166) = 4.17, p = .04, \text{ partial } \eta^2 = .03, M = 50.01, SD = 22.74 \] among women who had
miscarriage. The difference was not significant for women who experienced stillbirth or
miscarriage and stillbirth.

**Prosocial Behavior and Empathy**

To further understand prosocial behaviors and empathy, participants were
grouped as those who volunteered only online versus online and in-person. The
dependent variable was empathy. Since there were no variables that correlated with
empathy, ANOVA and not ANCOVA was performed. There were no significant
differences between rates of empathy for women who engaged in volunteering only
online \( (M = 68.73, SD = 9.60) \) compared to those who did so online and in person \[ F(1, 212) = 0.17, p = .89, (M = 68.95, SD = 9.66) \].

**Discussion**

The purpose of this study was to investigate the relationship between PTG,
empathy and prosocial behavior defined as volunteering either in-person or online. It was
hypothesized that women who engage in prosocial behavior following pregnancy loss
would show higher levels of empathy and PTG compared to those who do not, and that
the relationship between PTG and prosocial behavior would be mediated by empathy.

The majority of women in the current sample strongly believed that at the time of their loss, they were carrying a baby and that they considered the experience of pregnancy loss to be traumatic, which is consistent with previous research (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). A high percentage of participants in the current sample expressed that they were in some way engaged in the pregnancy loss community through either volunteering in-person (e.g. helping with fundraising events) or volunteering online by leaving posts or comments on Facebook that were either supportive (e.g. offering condolences, leaving uplifting comments on others’ pregnancy loss anniversaries) or informative (e.g. sharing information about miscarriage, sharing links to organizations that can be of assistance). Participants tended to engage in volunteering on an annual or semiannual bases and had been volunteering for more than 2 years.

Participants reported moderate levels of PTG, which was also consistent with the previous research conducted with women who have experienced miscarriage and stillbirth (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017). Women who had experienced stillbirth or stillbirth and miscarriage reported higher levels of PTG when compared to women who had experienced miscarriage. It is possible that stillbirth poses a bigger challenge to a woman’s core belief than miscarriage and higher levels of rumination are needed to process the death that is outside of the typical circle of life. As hypothesized by PTG theory, engaging in intrusive and deliberate rumination is needed to restore challenged beliefs and experience growth (Tedeschi et al., 2018). Further research is needed to specify if the difference in women’s PTG outcomes
following miscarriage and stillbirth related to difference in severity of core belief challenge immediately after the loss and levels of cognitive processing since the loss.

Contrary to the first hypothesis, no significant differences in PTG levels were found between women who engaged in volunteering versus those who did not. This was an unexpected finding and not in line with the previous research conducted with women who experienced stillbirth (Cacciatore et al., 2018). This discrepancy could have been related to how volunteering was defined. The current study included both in-person and online volunteering. Therefore, additional post hoc analyses were performed where only individuals who reported volunteering in-person and those who reported no volunteering were included in the analysis. The post hoc analysis findings indicated that there was a significant difference in women’s PTG levels, with women who volunteered in-person showing higher levels of PTG compared to those who did not volunteer at all, which was consistent with previous findings (Cacciatore et al., 2018).

Additional post hoc analyses were conducted to further explore this relationship. Analysis of covariance indicated that women who volunteered in-person as well as online showed higher levels of PTG compared to women who only volunteered online. Analyzing the data based on the type of loss showed that differences in volunteer setting, in-person versus online, were more significant for women who had experienced a miscarriage. Women who experienced a miscarriage and volunteered both in-person and online reported higher levels of PTG compared to those who reported to only volunteer online. Such a difference was not observed in women who experienced stillbirth or stillbirth and miscarriage. The current findings suggest that posting information or comments online that are meant to support parents who have experienced pregnancy loss
may not have the same effect on women’s experience of growth as in-person volunteering. Given the exploratory nature of the study and small sample size of women who volunteered, future research should further explore the relationship between volunteering and PTG.

PTG is a prolonged process that may be reinforced by volunteering as it can provide the volunteer with growth opportunities (Shannon & Bourque, 2005). Based on PTG theory (Tedeschi et al., 2018), volunteer work with other women who have experienced pregnancy loss may stimulate cognitive and emotional processing of the loss. It may assist in strengthening one’s sense of control and finding meaning. Emotional sharing, social support, and cognitive processing are the core promoters of PTG (Tedeschi et al., 2018). Engagement in training for volunteer work and in supervisory meetings of the volunteer group can provide opportunities for social support, sharing of emotions, and for cognitive and emotional processing of the experience and its meanings (Cohen & Numa, 2011). Such opportunities may not be as readily available in an online setting. Moreover, given the social stigma surrounding the topic of pregnancy loss (Brierley-Jones et al., 2015; Markin & Zilcha-Mano, 2018) and the potential lack of social recognition for pregnancy loss (Burden et al., 2016), it is not surprising that such community engagement seems to be more important for women who experience miscarriage.

There was a weak positive correlation between PTG and empathy. Surprisingly, scores on the empathy scale were not correlated with any demographic factors such as age, gender, race, social status, sexual orientation, or educational level, loss context factors or prosocial behavior indicators. Because of weak or non-existent correlations, the
mediation analysis was not conducted, leading to a lack of support for the second hypothesis. Any conclusions regarding this finding are hard to draw since this was the first study exploring the relationship between empathy, prosocial behavior and PTG in women who have experienced miscarriage or stillbirth. Previous research that found that prosocial behavior and empathy were associated with PTG were conducted with undergraduate students who had experienced at least one traumatic/stressful life event (El-Gabalawy et al., 2020). Therefore, it is possible that the relationship between the variables is different in a sample of perinatally bereaved women. The IRI scale (IRI; Davis, 1983) that was used in this study initially showed poor reliability with the current sample, suggesting that empathy may need to be conceptualized and assessed in a different way with women who experience pregnancy loss.

Clinical Implications

The current study has several implications for clinicians who work with women who have experienced pregnancy loss. Clinicians need to be careful not to perpetuate the stigma associated with pregnancy loss in the therapeutic relationship and to recognize that at the time of loss most women consider the fetus to be their baby. Moreover, the current findings suggest that pregnancy loss is a stressful and traumatic event that can be associated with experiences of growth. Therefore, clinicians should assess how the loss was perceived and the impact it had on women to ensure that the treatment plan adequately meets their needs.

The current findings suggest that women who engage in in-person volunteering show higher levels of PTG, especially women who experience miscarriage. Clinicians working with women who have experienced miscarriage or stillbirth may suggest
engaging in in-person volunteering rather than just online posting to facilitate women’s cognitive and emotional processing of the pregnancy loss experience and its meanings to foster PTG.

Clinicians should also be aware that women may engage in an online community to share their experiences with others, as this may differentially impact their post loss mental health outcomes. This study’s findings indicated that engaging in an online community by sharing supportive or informative comments did not contribute to increased levels of PTG. Furthermore, previous research found a correlation between amount of time spend on the internet and increased posttraumatic stress symptoms (Casellas-Grau et al., 2018). The authors suggested that the increased amount of time spend online was due to breast cancer patients’ attempts to fill gaps in their knowledge to gain a greater sense of control over the disease. On the other hand, the same study reported a positive relationship between PTG and searching the internet for psychosocial content in women survivors of breast cancer (Casellas-Grau et al., 2018). Patients with higher PTG were more likely to look for online psychosocial resources that supported the narrative of personal transformation through for example looking up healthier lifestyles or support groups, rather than focusing specifically on cancer-related information. Therefore, the type of online activity individuals engages in following a trauma may be related to their mental health outcomes. Given the nuanced relationship, discussing and assessing the impact of engagement in online loss communities on women’s post loss adjustment should be a part of the treatment. Further research is needed to clarify that relationship between online presence and differential mental health outcomes in individuals who experienced pregnancy loss.
Limitations

There are several limitations of this study that restrict its generalizability and implications. Participants were mostly recruited via social media and websites using convenience sampling, which is not necessarily representative of all users or reflective of views of all women who experience pregnancy loss. Moreover, it is possible that women who are engaged in online communities differ from women who have experienced pregnancy loss and are not part of an online community in terms of their level of prosocial behavior and empathy. It is important to note that the participants in this study predominately identified as white and had high socioeconomic status, limiting the generalizability of the current findings to diverse populations. The sample of women who reported engaging in in-person counseling was small \( (n = 40) \) compared to women who reported engaging in online volunteering only \( (n = 175) \) which raises questions regarding whether the findings would stay consistent if the samples were more comparable in size or if regression to the mean would have occurred. It is also likely that the study was underpowered to detect any differences between experiences of women who have experienced stillbirth versus miscarriage.

The correlational design of the study prevents inferring any causal relationships between the variables. The direction of the relationship between PTG and prosocial behavior also cannot be inferred. Additionally, it is possible that the relationship between variables is not linear; this was not detectable via this study’s design and method of analysis. In terms of limitations related to measurement, this study relied on self-report measures which may introduce bias as participants may not be accurately able to assess and report their level of growth and empathy. The IRI scale (IRI; Davis, 1983) initially
showed poor internal consistency, which may have impacted the extent to which it was associated with PTG. To date this is the first known study to use this scale with a sample of perinatally bereaved women. It is possible that empathy may need to be conceptualized and assessed in a different way with women who experience pregnancy loss.

**Future Research**

Based on the limitations of this study, future research should include a more diverse sample. For example, previous research indicated that African American women seem to be substantially underrepresented in an online pregnancy loss support community despite their higher risk for perinatal loss (Gold et al., 2012; Mukherjee et al., 2013). The authors suggested that the reason for lack of African American users on pregnancy loss message boards may indicate that preferences for type of bereavement support may vary by race. Therefore, it is important to understand African American women’s experiences and factors contributing to positive psychological changes following pregnancy loss.

Future research needs to further explore the direction of the relationship between prosocial behavior and PTG. Longitudinal study designs would be beneficial in providing evidence regarding whether individuals engage in volunteering as a result of their increased level of PTG or if individuals experience more PTG as the result of volunteering. Having an evidence for the direction of the relationship could provide more targeted interventions for women who experience pregnancy loss.

Given the finding that women who engaged in in-person volunteering showed more growth compared to those who did not, it would be important to further explore the relationship between engagement in online communities and post-loss adjustment. Factors such as length of time spent on the internet, reciprocity to the comments posted,
sense of belongingness, connectedness and its relationship with PTG and PTSD symptoms could provide additional insight into reasons for women’s engagement in online pregnancy loss communities and its impact on women’s psychological well-being following pregnancy loss.

Finally, future research should clarify the relationship between empathy and PTG in perinatally bereaved women to verify if the weak relationships found in this study were only true for the current sample. It is possible that alternative measures to the IRI scale (IRI; Davis, 1983) may need to be utilized when researching women who have experienced miscarriage or stillbirth.

Conclusion

This study contributes to the limited literature focused the relationship between women’s prosocial behavior, empathy and positive psychological outcomes following miscarriage and stillbirth. These findings suggest that women who engage in in-person volunteering report higher levels of PTG compared to those who do not volunteer at all or only volunteer online. A weak positive relationship was found between PTG and empathy. Empathy was not related to any other study variables, therefore a mediation analysis was not preformed. The current study adds to an understanding of the importance of volunteering in relation to growth following a traumatic event. Based on the current findings, it is important for clinicians to assess women’s perceptions, feelings associated with loss as well as tenancies to engage in online pregnancy loss communities. Encouraging clients to engaged in in-person volunteering may foster their experience of growth, especially following a miscarriage. Future research is needed to further explore the timing of the volunteering in relation to PTG as well as empathy and PTG.
Section 5

Conclusion

The purpose of the current dissertation was to fill a gap in the existing literature regarding posttraumatic growth (PTG) in women who have experienced pregnancy loss defined as either miscarriage or stillbirth. Specifically, this dissertation sought to expand researchers, counselor educators, mental health and health care providers understanding of the relationship between interpersonal and intrapersonal factors that can contribute to women’s experiences of growth following pregnancy loss. All three studies provided evidence that exploring PTG in this sample is warranted, as the majority of the participants perceived pregnancy loss to be severely traumatic and reported experiencing moderate levels of PTG following their loss(es). There were several loss context factors such as perceived personhood, that appeared to be related to an increase in PTG in the population studied. Losing a baby may shatter individual world assumptions. This is consistent with PTG theory, which notes the importance of a core belief challenge in experiencing growth (Tedeschi et al., 2018).

According to PTG theory, a challenge to an individuals’ core beliefs evokes an internal struggle between a person’s previous assumptions about the world and new insight gained following a traumatic event (Tedeschi et al., 2018). Loss context factors such as 1) perceiving the event to be severely traumatic, 2) thinking what was lost was a child that had a future, and 3) experiencing the loss later in pregnancy when the mother has started forming attachment bonds with the child, may have greater potential to disrupt and challenge important components of the assumptive world and lead to a reexamination of core beliefs (Linley & Joseph, 2004). Pregnancy loss is not consistent with most
assumptive world views and the typical reproductive narrative that many people recognize (Jaffe, 2011). Therefore, pregnancy loss that women experience to be highly stressful and that occurs after the women has started to develop prenatal attachment with the baby, can provide even greater challenge to an individuals’ fundamental component of the assumptive world, such as a sense of safety and identity as a mother (Diamond & Diamond, 2017; Hill et al., 2017). Greater distress can be related to higher potential for growth as more cognitive processing is required to make accommodations to the new assumptive world or assimilate the event into an existing cognitive structure, allowing individuals to integrate traumatic experiences into their life narrative (Tedeschi et al., 2018).

**Summarization of Major Findings**

The PTG model assumes that social support can influence the PTG process and outcomes (Tedeschi et al., 2018). This dissertation tested this assumption by investigating interpersonal and intrapersonal factors related to the experience of social support following pregnancy loss. The main finding in the first study showed that the relationship between pre-trauma factors, such as attachment anxiety and attachment avoidance, and PTG may exist through dyadic coping. This finding suggests that having mutual support between partners who share lived experience may be important for the individuals’ adjustment and experiences of growth following pregnancy loss. The main findings from the second study showed that the relationship between disclosure and PTG was mediated by rumination and that the response women receive following the disclosure of their pregnancy loss is related to their positive post-loss adjustment. Both study findings are consistent with the theory of PTG, which proposes that sharing thoughts with someone
who can offer a different perspective or constructive support can foster the development of new schemas and contribute to the experience of growth (Tedeschi et al., 2018). According to Tedeschi and colleagues (2018), sharing intrusive thoughts with someone trusted may help women look at things in a different and more hopeful and adaptive way. The listeners may be able to offer different perspectives or serve as role models, especially if they have experienced a similar event (Tedeschi et al., 2018).

The third study investigated the relationship between PTG and social support as an outcome. The data did not support the hypothesis that the relationship between PTG and prosocial behavior will be mediated by empathy. However, higher levels of PTG were found in women who volunteered in person and online compared to those who did not volunteer at all or only did so online. Due to the study design the direction between this relationship is unknown. Nevertheless, this finding provided some support for the PTG theory that volunteer work with other women who have experienced pregnancy loss may stimulate cognitive and emotional processing of the loss that is related to greater growth (Tedeschi et al., 2018).

Together the findings from the three studies contribute to the scarce literature focused on the relationship between social support and post loss adjustment. The findings from all three studies contribute to the evidence in previous research that the PTG theory can be applied to the experiences of women with a history of pregnancy loss.

Implications

This dissertation has several implications for clinical practice. First, clinicians need to consider pregnancy loss as not only a bereavement event but also a traumatic event for women that can shatter a woman’s assumptions about the world, including their
perceived sense of safety, identity, and future, especially as it relates to future reproductive outcomes (Freedle & Kashubeck-West, 2020). Clinicians should specifically focus on assessing loss context factors that have been shown to be related to women’s experiences of growth as they may relate to higher level of distress. These include areas such as severity of trauma, perceived personhood, gestational age at the time of loss, and type of loss (miscarriage or stillbirth). Based on the current findings, clinicians should also assess a woman’s adult attachment patterns as they may influence their ability to engage in positive dyadic coping. Finally, clinicians should assess a client’s history of disclosure and any social reactions experienced after disclosing their thoughts and feelings about the pregnancy loss as they can affect a woman’s ability to experience high levels of PTG.

In terms of treatment, current findings suggest that increasing relational security may be an important first step with couples who present to counseling following miscarriage or stillbirth. Increasing a woman’s ability to communicate their thoughts and feelings following the loss, request emotional or practical support, as well as increasing their partner’s ability to take on responsibilities to reduce their stress may improve a couples functioning following pregnancy loss. Encouraging women to disclose their thoughts and feelings associated with loss not only to their partner but also in therapy may help facilitate a change in ruminative thoughts from intrusive to deliberate. Clinicians should consider having a conversation with clients about the nature of ruminative thoughts and explaining that it is not uncommon to have intrusive negative thoughts immediately following a traumatic event such as pregnancy loss. This can help normalize the experience for women with this type of experience. Additionally, working
with clients to increase their ability to regulate their emotions is an important step to transition to deliberate rumination (Triplett et al., 2012). Clinicians may want to help clients discover the possible meaning of their experience by engaging in deliberate, reflective types of thinking. This in turn may facilitate positive psychological change. Previous studies have shown that discovering new meaning in life and finding a new sense of purpose may, in turn, lead to a higher level of life psychological well-being, indicating the importance of growth (Triplett et al., 2012).

Clinicians may also consider encouraging women who have experienced pregnancy loss to participate in in-person volunteering opportunities as this has been shown to be related with higher levels of PTG following pregnancy loss. Some examples of volunteer opportunities could include assisting with fundraising for a pregnancy loss awareness event such as a walk, volunteering at a neonatal unit, mentoring other parents, running an in-person support group or making memory objects for hospitals. At the same time, clinicians should be aware of and monitor client’s use of online communities and the impact they have on women’s well-being and post-loss adjustment. Posting supportive and informative comments online may not provide individuals with the same opportunity to stimulate cognitive and emotional processing of the loss needed for experience of growth as in person volunteering. Moreover, previous research has indicated that spending excessive time online may contribute to negative mental health outcomes such as posttraumatic stress symptoms (Casellas-Grau et al., 2018). Therefore, assessing an individual’s level of online engagement and associated mental health symptoms may be an important part of treatment.
In terms of broader advocacy levels, the second study’s findings indicate that how other’s respond to a woman’s disclosure of pregnancy loss plays a part in the woman’s positive post loss adjustment. Therefore, clinicians should engage in continuing efforts to break the stigma associated with pregnancy loss through education of the general public regarding pregnancy loss and the psychological toll it can take on women. Counselor educators should consider including topics related to reproductive trauma (e.g., miscarriage, stillbirth, infertility, and birth trauma) in their curriculum to increase counselor’s in training competency in working with this population. Discussing common clinical errors that counselors make and how they can affect the therapeutic relationship and treatment outcome (Markin, 2016) may decrease the incidence of such errors and improve the services provided to this population.

Limitations

The main limitations of the current line of research are the lack of diversity in the samples, the focus on the mother’s experiences, and the focus on the experiences of heteronormative couples. To date, the available literature has been focused on the experiences of white, well-educated, middle-class, and married women which limits generalizability of the findings to women who do not identify with such demographic characteristics. This is also consistent for this study/dissertation. Previous studies indicate that women of color (Mukherjee et al., 2013) have higher risk of perinatal loss. Therefore, it is important to understand the experiences of women of color and the factors contributing to psychological growth following pregnancy loss. Similarly, the current body of literature neglects the experiences of the LGBTQ community. A recent literature review conducted by the Health Equity, Diversity and Inclusion (HEDI) committee of the
Pregnancy Loss and Infant Death Alliance (PLIDA) only found ten articles focused on the perinatal loss experiences of lesbian and queer couples (HEDI, 2020). Similarly, fathers’ and partners’ experiences of loss have been largely neglected in the literature.

Another limitation of the current line of literature is the drought of empirical studies. The majority of the available literature consists of qualitative research or quantitative research with correlational design. Qualitative studies can provide keen insights into the phenomenon however, they are limited by generalizability and the potential for researcher bias. Similarly, correlational studies can provide greater insight into the relationship between the variables however, the direction of the relationship and causality cannot be inferred. The lack of empirical studies related to pregnancy loss is a significant limitation to the line of research.

Additionally, this dissertation is limited in its focus only on positive psychological changes that may take place following pregnancy loss, preventing any inferences regarding the influence of social support on women’s post loss adjustment as a whole. Given the previous research that PTG and PTSD symptoms are positively and linearly correlated, indicating that they are not on opposite ends of a single dimension (Shakespeare-Finch & Lurie-Beck, 2014), it is important to include both variables in research to better understand an individual’s journey toward healing following pregnancy loss.

**Future Research**

Based on the limitations of the current line of research there are several directions for future research. First, future studies should not only include more diverse samples but also design studies that focus specifically on the experiences of marginalized groups such
as women of color, LGBTQ community members, or non-pregnant partners. Conducting research focused on marginalized groups journey may positively impact the care they receive following pregnancy loss and their overall post-loss adjustment.

Second, there is a demonstrated need for studies that utilize designs other than exploratory or correlational. Due to the sequential cognitive processes that are theorized to take place in the development of growth (Tedeschi et al., 2018), utilizing longitudinal study designs could provide greater insight into the factors associated with PTG. For example, using a repeated measures design could indicate how individuals’ ruminative thoughts change over time and how the different levels of rumination are related to either positive or negative post-loss adjustment. Similarly, utilizing an experimental design when studying prosocial behavior could support inferring causality between an individual’s intent to act in a prosocial way and specific variables associated with their loss and adjustment.

Future studies should also look simultaneously at the positive and negative indicators of a woman’s functioning following miscarriage or stillbirth as they may not be mutually exclusive (Shakespeare-Finch & Lurie-Beck, 2014) and are likely to co-occur. PTG is conceptualized as positive but transformational change that may be driven by the same set of factors that may lead to PTSD symptoms (i.e. rumination), however, it is not the same as a decrease in PTSD symptoms (Tedeshi & Calhoun, 2004). To date there are only two studies that quantitively look at PTG as well as negative post-loss factors such as grief and PTSD (Krosch & Shakespeare-Finch, 2017; Lafarge et al., 2019). Therefore, further clarifying the factors that play a role in the development of PTG
and PTSD and exploring the likely curvilinear relationship between the two post trauma outcomes may be an important future research avenue.

Despite efforts to break the social stigma related to pregnancy loss, it continues to be evident in women’s everyday lives. Women who experience pregnancy loss often lack avenues to express their feelings and do not receive social recognition for their loss (Markin & Zilcha-Mano, 2018) compared to other types of death. As a result, some women are left to cope in isolation, especially if they have not yet announced their pregnancy, perpetuating feelings of shame and guilt (Diamond & Diamond, 2017).

Therefore, it is important to further explore whether a woman’s ability to discuss their experiences with family, friends and other individuals relates to their levels of engagement in repetitive thought and psychological outcomes following miscarriage or stillbirth. In order to improve clinical assessment and treatments offered by clinicians, researchers should further explore the differential impact of support from a close-knit social network, health care professionals, mental health professionals, as well as the support of an in-person versus online perinatal loss community. Cobb and colleagues (2006), have suggested that knowing someone who has had a similar life event and experienced growth can facilitate growth. Therefore, investigating the effectiveness of programs that utilize parents who have experienced loss in the past as companions or support group facilitators can further test this hypothesis.

Finally, given the traumatized nature of the current and previous samples of women who experienced miscarriage or stillbirth (Freedle & Kashubeck-West, 2020; Krosch & Shakespeare-Finch, 2017), an important avenue for future research is to investigate the appropriateness of standard trauma therapies with this population. Studies
have supported the positive effects of CBT, narrative and expressive therapies on PTG (Tedeschi et al., 2018). However, the success of such integration needs to be tested in parents who have experienced pregnancy loss. Additionally, effectiveness of computer or web-based intervention programs that can be delivered offline or online via a computer should be explored in this population. Web based interventions offer anonymity which can help women overcome stigma of accessing help. Systematic review of available research of web-based mental health interventions for women during perinatal period have shown to be a promising approach to the treatment and reduction of maternal mental health issues (Ashford et al., 2016).

**Section Conclusion**

This dissertation contributes to the limited literature focused on factors associated with experiences of growth in women following miscarriage or stillbirth. The overall findings suggest that factors associated with loss such as severity of trauma, personhood or type of loss are related to the level of PTG women experience. Moreover, women’s ability to communicate their thoughts and feelings with others can aid in important cognitive processes needed to facilitate PTG after loss. The current dissertation adds to an understanding of social factors that may play an important role in women’s development of PTG. Based on the current findings, it is important for clinicians to conduct a thorough assessment of factors associated with the loss as well as women’s social milieu after the experience of loss in order to inform mental health treatment. Future research is needed to further explore applicability of these findings to diverse populations, the causal relationship between the variables, and the relationship between positive and negative mental health outcomes following pregnancy loss.
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Appendix A: IRB Documents

DATE: July 27, 2020

TO: Agata Freedle

FROM: University of Missouri-St. Louis IRB

PROJECT TITLE: [1597723-2] Social Support Following Pregnancy Loss and its Implications for Women's Experiences of Posttraumatic Growth

REFERENCE #:

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVED

APPROVAL DATE: July 27, 2020

EXPIRATION DATE: July 27, 2021

REVIEW TYPE: Full Committee Review

This proposal was approved by the University of Missouri-St. Louis IRB for a period of one year starting from the date listed above. The University of Missouri-St. Louis IRB must be notified in writing prior to major changes in the approved protocol. Examples of major changes are the addition of research sites or research instruments.

An annual report must be filed with the committee. This report should indicate the starting date of the project and the number of subjects since the start of project, or since last annual report.

Any consent or assent forms must be signed in duplicate and a copy provided to the subject. The principal investigator is required to retain the other copy of the signed consent form for at least three years following the completion of the research activity and the forms must be available for inspection if there is an official review of the UM-St. Louis human subjects research proceedings by the U.S. Department of Health and Human Services Office for Protection from Research Risks.

This action is officially recorded in the minutes of the committee.

If you have any questions, please contact Carl Bassi at 314-516-6029 or bassi@umsl.edu. Please include your project title and reference number in all correspondence with this committee.
Please supply (on numbered additional pages) the information requested below. Use the same Roman Numerals and capitalized key words to identify each section. Your responses should be concise.

I. Introduction

Briefly describe the GENERAL PURPOSE of the study.

The purpose of the proposed dissertation research is to investigate how social support can contribute to an individual's experience of posttraumatic growth (PTG; Tedeschi & Calhoun, 1996) following pregnancy loss.

Social support is considered to be one of the main factors contributing to positive adjustment following a traumatic event. Having a network of individuals that can offer emotional and behavioral support has been related to decrease in negative mental health outcomes (Juth et al., 2015) and foster positive psychological outcomes such as PTG (e.g. Dong et al., 2017). PTG refers to the “positive psychological changes experienced as a result of the struggle with highly challenging life circumstances” (Tedeschi & Calhoun, 2004, p. 1). For growth to occur, the event has to shatter an individual's core beliefs (Tedeschi & Calhoun, 2004). Through cognitive processes facilitated by social support, individuals can experience growth (Tedeschi et al., 2018).

There is a growing body of literature that shows that women can experience PTG following pregnancy loss (Freedle & Kashube-West, 2020; Krosh & Shakespeare-Finch, 2017; Lafarge, 2019). However, the mechanisms associated with that change continue to be vastly unexplored in this population. Due to continued social stigma surrounding the topic of pregnancy loss (Markin & Zilcha-Mano, 2018), misinformation in the general public regarding the impact of pregnancy on an individual's adjustment (Bellhouse et al., 2018), and social constraints placed on the grieving process (Lang et al., 2011), well-intended social support can sometimes be paradoxically detrimental to an individual's mental health outcomes and overall well-being following pregnancy loss (Meyer, 2016). Therefore, given the unique aspects of the loss and subsequently the type and amount of social support that is being received it is important to understand the factors through which social support can foster positive psychological change following pregnancy loss. The research focused on the impact of social support on an individuals' positive post pregnancy loss sequelae have been under researched. To date there is only one study that specifically focused on exploring the relationship between an aspect of social support, such as prosocial behavior, and PTG in women who have experienced stillbirth (Cacciatore et al., 2018). More research is needed to provide support for applying the PTG model to understand individuals’ experiences following pregnancy loss.

To address the gap in the current literature this research aims to explore the relationship between interpersonal and intrapersonal factors such as adult attachment, dyadic coping, self-disclosure, positive social reactions to disclosure, empathy, rumination, and prosocial behavior; and PTG following miscarriage or stillbirth.
List the SPECIFIC AIMS and HYPOTHESES or RESEARCH QUESTIONS.

The proposed dissertation research will strive to address three research questions. There is a set of hypotheses associated with each question (see below):

Research Question 1: What is the relationship of women’s adult attachment on their dyadic coping and PTG following pregnancy loss?

Hypothesis 1: Attachment security will be a positive significant predictor of PTG when loss context factors are controlled for.
Hypothesis 2: The relationship between attachment security and PTG will be partially mediated by forms of dyadic coping (positive, supportive, delegated and stress communication).

Research Question 2: What is the relationship between self-disclosure, positive social reactions to disclosure, rumination, and PTG in women who have experienced miscarriage?

Hypothesis 1: Self-disclosure will be a positive significant predictor of deliberate rumination and PTG when loss context factors are controlled for.
Hypothesis 2: Deliberate rumination will mediate the relationship between self-disclosure and PTG.
Hypothesis 3: Positive social reaction will moderate the indirect path (via deliberate rumination) and direct path from self-disclosure to PTG.
   a) For the moderated indirect effect, it is hypothesized that the association between self-disclosure and PTG through deliberate rumination will be stronger for women who report higher rates of positive social reactions than those who report lower rates of positive social reactions following a disclosure of pregnancy loss.
   b) For the moderated direct effect, it is hypothesized that the association between self-disclosure and PTG will be stronger for women who report rates of positive social reactions than those who report lower rates of positive social reactions following a disclosure of pregnancy loss.

Research Question 3: What is the relationship between empathy, prosocial behavior and PTG in women who have experienced pregnancy loss?

Hypothesis 1: Women who will engage in prosocial behavior following pregnancy loss will show higher levels of empathy and PTG compared to those who do not.
Hypothesis 2: The relationship between PTG and prosocial behavior will be partially mediated by empathy.

II. Methods
Describe the EXPECTED GROUP(S) (control, experimental, etc.) to be used.

The study will be a non-experimental, descriptive correlational study focused on exploring the strength and direction of the relationship between the variables. Participants will be asked to provide responses on self-report measures accessed via an online survey designed using Qualtrics platform.

Give the NUMBER OF SUBJECTS anticipated for inclusion in each of the above groups.

It is anticipated that 600 participants will complete the online survey.
Outline the INCLUSION CRITERIA for subjects (justify the involvement of any of the special groups listed in the General Application, questions 5 or 6). Include how subjects will be recruited.

To be included in the study, individuals must be at least 18 years old, and have experienced a pregnancy loss, as defined by the Centers for Disease Control (2018) as miscarriage (loss of a pregnancy before 20 weeks of gestation) or still birth (baby born without signs of life after 20 weeks of gestation).

Participants will be recruited using convenience and snowball sampling methods. The recruitment strategy will include advertising and posting the invitation to participate in the study on social media (e.g. Facebook, Instagram and Twitter) and online websites (e.g. Craigslist). Participants will also be recruited by posting flyers on public announcement boards in public places (e.g. public libraries or ob-gyn offices). Participants will self-identify with the eligibility criteria and complete an online survey. Participation will be voluntary.

Describe the ROLE OF SUBJECTS, including what they will be asked to do and whether deception will occur.

There will be no deception involved in this study. Participants will be asked to complete an online survey which consists of a demographic questionnaire and seven validated and reliable measures frequently used in research (see attached survey).

Describe all MEASUREMENT PROCEDURES. Attach copies of any questionnaires, measurement instruments, or interview protocols to be used.

Demographic variables will be collected that include current age, ethnicity, educational level, employment status, current income and relationship status. Loss context factors to be assessed include type of loss, the number of pregnancy losses, time since the loss, gestational age of the baby or fetus at the time of loss, and whether participants have had living children. A definition of a traumatic event, based on the Diagnostic and Statistical Manual of Mental Disorders (5th ed.) conceptualization of trauma (APA, 2013), will also be provided and participants will be asked to rate the severity of their experience from 0 (not traumatic) to 9 (very severely traumatic). Variations of this question have often been used in trauma research to control for trauma severity (e.g., Freedle & Kashubeck-West, 2020; Krosh & Shakespeare-Finch, 2017). Participants’ perceived personhood related to pregnancy will be assessed by asking to what degree did they believe that their baby or pregnancy was a person (Cote-Arsenaul, 2018).

The following validated and reliable measures will be used:

1) Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996), which measures positive changes that may be experienced in the aftermath of trauma. Participants will rate the occurrence of personal changes that have arisen pursuant to their loss;
2) Event-Related Rumination Inventory (ERRI; Cann et al., 2011), which is designed to assess rumination in relation to a specified life event. Participants will be asked to report their predominate rumination style (deliberate or intrusive) over the last few weeks;
3) Experiences in Close Relationships Scale-Short Form (ECR-S; Brennan et al., 1998; Wei et al., 2007), will be used to measures women adult attachment security;
4) Dyadic Coping Inventory (DCI; Bodenmann, 2008), assesses stress communication and dyadic coping as perceived by women about their own coping, women’s perception of the other partner’s coping, and women’s perception of how partners’ cope as a couple;
5) *The Distress Disclosure Index* (DDI; Kahn & Hessling, 2001) will be used to assess women’s tendency to conceal versus disclose personally distressing information;
6) *Social Reactions Questionnaire* (SRQ; Ullman, 2000) will be used to measure participants’ perceptions of positive reactions to disclosure. For the purpose of this dissertation only the emotional support subscale and the tangible aid/instrumental support subscale will be used;
7) *Interpersonal Reactivity Inventory* (IRI; Davis, 1983) will be used to measure empathy.

Participants will be asked an additional nine questions that were designed specifically for this study focused on prosocial behavior.

Prosocial behavior will be defined as either volunteering in any in-person capacity or posting content online that is meant to benefit women who have experienced pregnancy loss. Women will be asked about the type of volunteering they engage in, its duration and frequency. Prior research has assessed volunteering similarly (e.g., El-Gabalawy, 2010).

Describe the EXPECTED DURATION of the subject's participation.

It is expected that it will take participants approximately 20-30 minutes to complete the online survey. The time discrepancy is because based on participant’s responses, they may not have to answer all of the questions. For example, based on the research questions and hypothesis, only participants who reported having a miscarriage will be asked to complete the Distress Disclosure Index.

III. Risk/Benefit Assessment

Describe any RISKS TO THE SUBJECT that might arise from participation in the study. Subjects should be protected against injury and invasion of their privacy, and their dignity should be preserved. Risks fall under the following categories: physical, psychological, social, economic, legal, and other.

No physical, social, economic or legal risks are expected to be associated with taking part in this study. Psychological risk is expected to be minimal to moderate. Participants may experience psychological discomfort, including feeling anxious, sad, ashamed or guilty, when answering questions regarding their pregnancy loss and how it impacted their life.

Describe STEPS TAKEN TO MINIMIZE RISK.

In order to mitigate any potential risk participants will be provided with a resource list at the beginning of the survey and at the end which may validate their feelings and can connect them to resources they can utilize if they feel such need.

Moreover, prior to taking the survey participants will be made aware of the nature of the study through the recruitment statement and informed consent. Based on the provided information participants will self-select to participate in the research. Throughout the survey the participants will be informed when potentially triggering questions are about to be asked. Participants will be reminded that their participation is voluntary, and they may skip questions, skip a section or end the survey altogether at any time if they wish to do so. Participants will also be made aware that they will not be penalized for withdrawing from the survey and will still be able to enter the drawing to win a gift card.
All the collected data will be in electronic form. A reliable and secure software program called Qualtrics will be used to collect and store participants data. Access to this software is password protected and only the PI and the PI’s dissertation committee (Agata Freedle, Dr. Emily Oliveira, Dr. Susan Kashubeck-West, Dr. Lee, and Dr. Rachel Wamser-Nanney) will have access. Data collected on these surveys will be exported to an SPSS worksheet. This worksheet will be encrypted and password protected. Confidential identifying information (e.g. name, address, phone number, IP addresses) will not be collected from the participants in the research survey. At the end of the survey participants will be asked if they would like to enter the drawing. If participants are interested in the drawing they will be asked to click on a link to a separate survey. Once participants click on the link, a new survey will open in a separate window where they will be asked to provide their name and method of contact (phone number or email). This drawing survey will not be linked in any way with their responses to the study survey. Therefore, the PIs will be unable to connect participants’ names to their responses regarding pregnancy loss experiences.

Describe the POSSIBLE BENEFITS TO THE SUBJECT.

There are no direct benefits to the participants. However, participants will have a chance to enter into a drawing to win a $10 Amazon gift card. There will be 60 gift cards given away. The chances of winning the gift card are estimated to be about 10% depending on the final number of participants. Again, to protect participants’ anonymity, a separate survey will be created and distributed for the drawing where participants will provide their name and way of contact. This survey will not be linked in any way with their previous responses.

Describe the POSSIBLE BENEFITS TO SOCIETY.

There has been growing recognition that focusing solely on the negative impact of adverse events does not provide a complete clinical picture of an individual’s responses to trauma (Krosch & Shakespeare-Finch, 2017). Given the paucity of the current research on women’s positive adjustment following pregnancy loss, factors and mechanisms through which social support act as a way to facilitate the development of a higher level of functioning needs to be explored in this population. Exploring such a relationship will expand our understanding of the applicability of the PTG model to miscarriage or stillbirth, bereavement and traumatic events that are highly stigmatized. Understanding social factors associated with positive psychological change post-trauma that can occur in women who have experienced pregnancy loss may provide clinicians with insight on how to help clients access social support that can foster their adaptive functioning. On a broader advocacy level, the proposed studies can aid the continued efforts to break the stigma associated with pregnancy loss. The studies may increase clinicians’, researchers’ and the public’s understanding that providing individuals with space to disclose their feelings and encouraging women to engage in supportive communities online or in person can impact their psychological well-being. This research will increase and improve the body of counseling research on the topic of pregnancy loss, and provide tangible recommendations for further research and guidelines for clinical practice.

IV. Debriefing Statement (if project involves deception)

Attach a copy of the debriefing statement explaining the deception. Deceptive techniques must be justified by the study’s prospective scientific, educational, or applied value, and the investigator should explore equally effective alternative procedures that do not use deception. Investigators should not use deception when it would affect the subjects’ willingness to participate (for example, deception regarding physical risks, discomfort, or unpleasant emotional experiences).
V. **Subject/Parental Consent Form(s)**
Attach all consent forms (on University or agency letterhead) and indicate how they will be maintained. The research investigator is responsible for retaining all signed consent documents for at least three years past the completion of the research activity.

VI. **Assent Form** (must be included if project involves minors)
Attach all assent forms (on University or agency letterhead) and indicate how they will be maintained. The research investigator is responsible for retaining all signed assent documents for at least three years past the completion of the research activity.

VII. **Other Required Forms** (if necessary) If your study involves:
A. Deception you must complete and submit Form 09 Deception in Research Checklist
B. Prisoners you must complete and submit Form 10 Prisoner Participant Checklist

Applications for full committee review must be submitted on irbnet.org 10 days before the scheduled meeting in order to be reviewed that month. Please check the ORA web site (http://www.umsl.edu/services/ora/IRB.html) for a list of upcoming meeting dates.
Invitation to Participate

Have you experienced pregnancy loss (miscarriage or stillbirth)? We invite you to participate in a research study by Agata Freedle and Dr. Emily Oliveira from the University of Missouri-St. Louis and share your experiences with us by completing an online survey.

This research study focuses on better understanding women’s experiences following a pregnancy loss (miscarriage or stillbirth). Miscarriage has been defined by the Centers for Disease Control (2018) as loss of a fetus/baby prior to 20 weeks of gestation, whereas still birth is a fetus/baby born without signs of life after 20 weeks of gestation. Specifically, we are interested to see how the social support you have received following pregnancy loss has impacted your ability to identify any positive personal changes that have taken place since your loss. As a participant, you will complete an online survey, which should take you about 20-30 minutes to complete.

Some of the questions will ask you about your loss, such as what type of loss you experienced (miscarriage vs stillbirth), gestational age prior to the loss, your feelings toward pregnancy and the loss (whether it was a traumatic event for you). This survey is voluntary.

For your time, after completing the survey you will be able to enter a drawing to win one of sixty $10 Amazon gift cards. Your odds of winning a gift card are about 10%, depending on the final number of participants.

If you are interested in participating, here is the link to the survey:

We appreciate your time,

Agata and Emily

Agata Freedle, M.A., NCC, LPC
Emily Oliveira, PhD
University of Missouri-St. Louis
Informed Consent for Participation in Research Activities
Social Support Following Pregnancy Loss and its Implications for Women’s Experiences of Posttraumatic Growth

Participant __________________________________________ HSC Approval Number
Principal Investigator __Agata Freedle___________ PI’sPhone Number:314-266-9851___

Summary of the Study

1. You are invited to participate in a research study conducted by Agata Freedle, M.A. and Dr. Emily Oliveira, PhD, from the University of Missouri-St. Louis because you self-identified as having experienced a pregnancy loss (miscarriage or stillbirth). Your participation in this research is voluntary. The purpose of this research is to better understand women’s experiences following a pregnancy loss defined by Center for Disease Control (2018) as either miscarriage (loss of baby prior to 20 weeks gestation) or stillbirth (baby born without signs of life after 20 weeks gestation). Specifically, we are interested to see how the social support you received following your pregnancy loss has impacted your ability to identify any positive personal changes that have taken place since your loss. Your participation will involve filling out an online survey which should take you approximately 20 to 30 minutes to complete. There may be certain risks or discomforts associated with this research. They include uncomfortable feelings that might come from answering certain questions. There are no direct benefits to your participation. However, after completing the survey you will be eligible to will be able to enter into a drawing to win one of sixty $10 Amazon gift cards.

2. a) Your participation will involve completing an online survey. You will be asked questions regarding your loss such as what type of loss you experienced (miscarriage vs stillbirth), gestational age prior to the loss, causes of your loss, your feelings toward the pregnancy and the loss (whether or not it was a traumatic event for you). You will be asked questions about factors that shaped your experiences of social support following your pregnancy loss such as your self-disclosure of pregnancy loss and how it was received, empathy, your style of coping with your partner if you were in a committed romantic relationship at the time of conception and loss, rumination or volunteering. You will also be asked about positive psychological changes you may have experienced after your pregnancy loss. Detailed instructions on how to complete the survey will be provided throughout the survey.
Approximately 600 people may participate in this research study.

b) The amount of time involved in your participation will be 20-30 minutes. We understand that completing this survey may be difficult for you. Therefore, as a token of our appreciation, after completing the survey you will be able to enter into a drawing to win one of sixty $10 Amazon gift cards. There will be a separate link to a site where you can provide your name and a way we can contact you. We will not be able to connect your name to the survey; your answers will remain confidential. Your chances of winning the gift card are approximately 10% depending on the final number of participants.

3. There may be certain risks or discomforts associated with this research. They include uncomfortable feelings that might come from answering certain questions. We will try to minimize these feelings by letting you know when particularly hard questions are about to be asked. Remember that this is a voluntary study and you may skip a question, skip a whole section of questions by clicking “next”, or end the survey at any point by closing your browser. You will not be penalized for ending the survey and will still be eligible to enter the drawing to win a gift card. At the beginning and the end of the survey you will be provided with a list of resources if you feel like you need someone to talk to about your emotions or if you would like to connect to the pregnancy loss community.

4. There are no direct benefits for participating in this study. However, your participation may contribute to our knowledge about women’s experiences following the pregnancy loss and may help in providing better services for them. Specifically, this study’s results may increase clinicians’ awareness of what type of social support factors contribute to women’s positive post-loss adjustment.

5. Again, your participation is voluntary, and you may choose not to participate in this research study, participate in only part of the study or to withdraw your participation at any time. If after you have completed the survey you later want to withdraw from the study for any reason, you can contact me at amf352@mail.umsl.edu. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. All the collected data will be in electronic form. A reliable and secure software program called Qualtrics will be used to collect and store participants’ data. Access to this software is password protected and only the principal investigators (Agata Freedle and Dr. Emily Oliveira) will have access. Data collected on these surveys will be exported to SPSS worksheet. This worksheet will be encrypted and password protected. Confidential identifying information (e.g. name, address, phone number, IP addresses) will not be collected from you in the research survey. At the end of the survey you will be asked if you would like to enter the drawing. If yes, please click on the link provided. Once you click on the link, a new survey will open in a separate window. In that survey we will ask you for your name and a way to contact you (email or phone number). This survey will not be linked in any way with your previous responses and will appear whether or not you answer all of the questions. The PIs will be unable to connect your name to your responses regarding pregnancy loss experiences. Your identity will not be revealed in any publication that may result from this study. In rare instances, a researcher's study may undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection).
that would lead to disclosure of your data as well as any other information collected by the researcher to official auditors.

7. By agreeing to participate, you understand and agree that your data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, your identity will not be revealed. In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your data. In addition, all data will be stored on a password-protected computer and/or in a locked office.

8. If you have any questions or concerns regarding this study, or if any problems arise, you may email the investigator, Agata Freedle (email: amf352@mail.umsl.edu) or Emily Oliveira (email: EmilyOliveira@umsl.edu). You may also ask questions or state concerns regarding your rights as a research participant to the Office of Research Administration, at 516-5897.

Pressing the “continue” button below signifies your consent to participate in ours study. If you choose not to participate, please close your browser.
Review of Study Goals and Mental Health Resources

Thank you for participating in our study. We appreciate your time. The aim of this study is to explore factors contributing to women’s posttraumatic growth (PTG), a psychological construct that focuses on positive gains following a traumatic event, such as a pregnancy loss. The study aims to explore the relationship between interpersonal and intrapersonal factors that may impact individual’s experience of social support such as adult attachment, dyadic coping, self-disclosure, positive social reactions to self-disclosure, empathy, rumination, or prosocial behavior women’s positive psychological adjustment such as PTG following miscarriage or stillbirth. Your participation contributed to our understanding of how those factors are related which will help us design more effective treatment programs for women who experienced pregnancy loss.

Each women’s experience is unique, and we appreciate you sharing your experiences with us. We understand that sometimes thinking about your loss may bring up memories that you may have not thought about in a while or bring back up difficult emotions. If that is the case, we urge you to take advantage of personal resources you have (your spouse, support group, therapist, friends, family) or the list of mental health resources provided below to help you cope. Sometimes knowing that you are not going through this experience alone is helpful, therefore the provided list also contains groups and resources specifically for women following pregnancy loss.

Again, we really appreciate your time and willingness to share your experiences with us. If you have any questions, please do not hesitate to contact us at amf352@mail.umsl.edu or EmilyOliveira@umsl.edu

<table>
<thead>
<tr>
<th>Mental Health Resources</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Suicide Prevention Lifeline</td>
<td>1-800-273-8255</td>
</tr>
<tr>
<td>Available 24/7, confidential, toll free</td>
<td></td>
</tr>
<tr>
<td>Substance Abuse and Mental Health Services Administration (SAMHSA) Treatment Referral Helpline</td>
<td>1-800-662-HELP (4357)</td>
</tr>
<tr>
<td>Pregnancy and Infant Loss Directory</td>
<td><a href="http://www.pregnancylossdirectory.com/#home-section">http://www.pregnancylossdirectory.com/#home-section</a></td>
</tr>
<tr>
<td>(you can find local providers for individual and group support)</td>
<td></td>
</tr>
<tr>
<td>National Share-Pregnancy and Infant loss support</td>
<td>nationalshare.org 800-821-6819</td>
</tr>
<tr>
<td>Postpartum Support International</td>
<td>1-800-944-4773</td>
</tr>
<tr>
<td>Pregnancy After Loss (PAL)</td>
<td><a href="https://pregnancyafterlosssupport.com">https://pregnancyafterlosssupport.com</a></td>
</tr>
</tbody>
</table>
Appendix B: Demographic Items

1. What is your Age? (Enter a whole number)___________

2. What is your Gender? ______________

3. What was your gender assigned at birth?_____________

4. Do you consider yourself to be:
   ___Lesbian
   ___Gay
   ___Bisexual
   ___Straight/Heterosexual
   ___Pansexual
   ___Queer
   ___Questioning
   If the options above do not accurately describe you how you identify yourself, please share with us how you self-identify_________

5. What is your race/ethnicity? (check all that apply)
   ___Black/African American
   ___White/European American
   ___Asian/Asian American
   ___Hispanic/Latina
   ___Native American/Indigenous American
   ___Native Hawaiian/Pacific Islander
   If the options above do not accurately describe you how you identify yourself, please share with us how you self-identify_________

6. What is your current employment status?
   ___Employed part time (Less than 30 hours a week)
   ___Employed full time (More than 30 hours a week)
   ___Student
   ___Unable to work (receiving benefits)
   ___Unemployed, looking for work
   ___Unemployed, not looking for work
   ___Other please specify______________

7. What is the highest level of education you have completed?
   ___No High School
   ___High School Diploma/GED
   ___Some College classes, no degree
   ___Associate’s degree
   ___Bachelor’s degree
   ___Some Graduate School, no degree
   ___Master’s degree
__ Doctoral/Professional degree

8. Which most closely describes how you experience your social class in the past 5 years?
   __ Very low income/poverty level
   __ Working class
   __ Middle class
   __ Upper middle class
   __ Upper class

9. What is your Relationship Status?
   __ In a relationship
   __ Not in a relationship
   __ Married
   __ Divorced
   __ Separated
   __ Widowed

   If the options above do not accurately describe your current relationship status, please share with your relationship status_____

10. At the time of conception and pregnancy loss were you in a committed romantic relationship?
    __ Yes       __ No

11. If you are in a relationship, is your current relationship with the same partner that you had at the time of the pregnancy loss?
    __ Yes       __ No

12. What is the region where you live:
    __ Northeast
    __ Southwest
    __ Southeast
    __ Northwest
    __ Midwest/Central
    __ Other (please specify)____
Appendix C: Loss Context Factors

1. Have you experienced a miscarriage? (loss of pregnancy before 20 weeks gestation)
   ___ Yes   ___No

2. Have you disclosed your experience of miscarriage to family, friends or others?
   ___ Yes   ___No

3. Have you experienced a stillbirth (baby born without signs of life after 20 weeks gestation)
   ___ Yes   ___No

4. Have you experienced multiple pregnancy losses (miscarriage, still birth or both)?
   ___ Yes   ___No

5. If yes, how many pregnancy losses have you experienced? (Enter a whole number)
   ___

6. How long ago was your first pregnancy loss (miscarriage or still birth)? (Enter number of weeks, months or years e.g. 3 months)__________ago

7. How long ago was your most recent pregnancy loss (miscarriage or still birth)?
   (Enter number of weeks, months or years e.g. 3 months)__________ago

8. How many weeks were you pregnant before the loss occurred?
   1st loss______(enter number of weeks)
   2nd loss______(enter number of weeks)
   3rd loss______(enter number of weeks)
   4th loss______(enter number of weeks)
   5th loss______(enter number of weeks)
   6th loss______(enter number of weeks)
   Use the box provided to enter any additional losses

9. Do you have any living children?
   ___ Yes   ___No

10. If yes, did pregnancy loss occur before you had living children, after or both?
    ___Prior to having living children
    ___After having living children
11. Was your pregnancy loss associated with a fertility treatment?

___ Yes     ___ No

12. In the period immediately before your loss, to what degree did you believe that your baby or pregnancy was a person?

Not at all degree                      A very great

0  1  2  3  4  5  6  7  8  9

DEFINITION OF TRAUMA
Being exposed to actual or threatened death, serious injury, or sexual violence in one of the following ways: 1) Directly experiencing the traumatic event(s); 2) Witnessing in person the event(s) as it occurred to others; 3) Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental; 4) Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g. first responders collecting human remains; police officers repeatedly exposed to details of child abuse)

13. Based on the definition provided, how would you rate the severity of your experience with pregnancy loss?

Not Traumatic                       Severely Traumatic

0  1  2  3  4  5  6  7  8  9

14. Do you believe that your experience of pregnancy loss and post-loss adjustment have been significantly impacted by the COVID-19 pandemic?

___ Yes     ___ No

15. If responded yes to question 13, please explain.
Appendix D: Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996)

For each of the statements below, use the scale provided to indicate the degree to which this change occurred in your life as result of having a miscarriage or stillbirth.

Rate the degree to which you experienced each type of change using the scale below.
0= I did not experience this change as a result of my crisis.
1= I experienced this change to a very small degree as a result of my crisis.
2= I experienced this change to a small degree as a result of my crisis.
3= I experienced this change to a moderate degree as a result of my crisis.
4= I experienced this change to a great degree as a result of my crisis.
5= I experienced this change to a very great degree as a result of my crisis.

1. I change my priorities about what is important in life.
2. I have less of an appreciation for the value of my own life.
3. I developed new interests.
4. I have diminished feeling of self-reliance.
5. I have a better understanding of spiritual matters.
6. I more clearly see that I cannot count on people in times of trouble.
7. I established a new path for my life.
8. I have a greater sense of distance from others.
9. I am more willing to express my emotions.
10. I am less certain that I can handle difficulties.
11. I am able to do better things with my life.
12. I am less able to accept the way things work out.
13. I can better appreciate each day.
14. Fewer opportunities are available than would have been before.
15. I have less compassion for others.
16. I put more effort into my relationships.
17. I am less likely to try to change things that need changing.
18. I have a weaker religious faith.
19. I discovered that I’m stronger than I thought I was.
20. I learned a great deal about how disappointing people are.
21. I better accept needing others.
Appendix E: Experiences in Close Relationship Scale-Short Form (ECR-S; Brennan et al., 1998; Wei et al., 2007)

Instruction: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Slightly Disagree</td>
<td>Neutral</td>
<td>Slightly Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

1. It helps to turn to my romantic partner in times of need
2. I need a lot of reassurance that I am loved by my partner.
3. I want to get close to my partner, but I keep pulling back.
4. I find that my partner(s) don't want to get as close as I would like.
5. I turn to my partner for many things, including comfort and reassurance.
6. My desire to be very close sometimes scares people away.
7. I try to avoid getting too close to my partner.
8. I do not often worry about being abandoned.
9. I usually discuss my problems and concerns with my partner.
10. I get frustrated if romantic partners are not available when I need them.
11. I am nervous when partners get too close to me.
12. I worry that romantic partners won't care about me as much as I care about them.
This scale is designed to measure how you and your partner cope(d) with stress. Please indicate the first response that you feel is appropriate. Please be as honest as possible. Please response to all items by marking the appropriate case, which is fitting to your personal situation. There are no false answers. **If you are not presently with the partner you had at the time of your loss, please complete all questions as if you were with the partner you had at the time of your loss.**

This section is about how you communicate your stress to your partner.

<table>
<thead>
<tr>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I let my partner know that I appreciate his/her practical support, advice, or help.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>I ask my partner to do things for me when I have too much to do.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I show my partner through my behavior when I am not doing well or when I have problems.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4.</td>
<td>I tell my partner openly how I feel and that I would appreciate his/her support.</td>
<td></td>
<td></td>
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</table>

This section is about what your partner does when you are feeling stressed.

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<tr>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>My partner shows empathy and understanding to me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>My partner expresses that he/she is on my side.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>My partner blames me for not coping well enough with stress.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>My partner helps me to see stressful situations in a different light.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>My partner listens to me and gives me the opportunity to communicate what really bothers me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>My partner does not take my stress seriously.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>My partner provides support but does so unwillingly and unmotivated.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>My partner takes on things that I normally do in order to help me out.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>My partner helps me analyze the situation so that I can better face the problem.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>When I am too busy, my partner helps me out.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.</td>
<td>When I am stressed, my partner tends to withdraw.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This section is about how your partner communicates when he/she is feeling stressed.

<table>
<thead>
<tr>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.</td>
<td>My partner lets me know that he/she appreciates my practical support, advice, or help.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>My partner asks me to do things for him/her when he has too much to do.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18.</td>
<td>My partner shows me through his/her behavior that he/she is not doing well or when he/she has problems.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19.</td>
<td>My partner tells me openly how he/she feels and that he/she would appreciate my support.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This section is about what you do when your partner makes known his/her stress.

<table>
<thead>
<tr>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.</td>
<td>I show empathy and understanding to my partner.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>21.</td>
<td>I express to my partner that I am on his/her side.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I blame my partner for not coping well enough with stress.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>I tell my partner that his/her stress is not that bad and help him/her to see the situation in a different light.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>I listen to my partner and give him/her space and time to communicate what really bothers him/her.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>I do not take my partner’s stress seriously</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>When my partner is stressed, I tend to withdraw.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>I provide support but do it so unwillingly and unmotivated because I think that he/she should cope with his/her problems on his/her own.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>I take on things that my partner would normally do in order to help him/her out.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>I try to analyze the situation together with my partner in an objective manner and help him/her to understand and change the problem.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>When my partner feels he/she has too much to do, I help him/her out.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This section is about what you and your partner do when you are both feeling stressed.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.</td>
<td>We try to cope with the problem together and search for ascertained solutions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>We engage in a serious discussion about the problem and think through what has to be done.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>We help one another to put the problem in perspective and see it in a new light.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>We help each other relax with such things like massage, taking a bath together, or listening to music together.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>We are affectionate to each other, make love and try that way to cope with stress.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This section is about how you evaluate your coping as a couple.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>very rarely</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.</td>
<td>I am satisfied with the support I receive from my partner and the way we deal with stress together.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>I am satisfied with the support I receive from my partner and I find as a couple, the way we deal with stress together is effective.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix G: Distress Disclosure Index (DDI; Kahn & Hessling, 2001)

Please read each of the following items carefully. Indicate the extent to which you agree or disagree with each item according to the rating scale below:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td></td>
<td></td>
<td></td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. When I feel upset, I usually confide in my friends.
2. I prefer not to talk about my problems.
3. When something unpleasant happens to me, I often look for someone to talk to.
4. I typically don’t discuss things that upset me.
5. When I feel depressed or sad, I tend to keep those feelings to myself.
6. I try to find people to talk with about my problems.
7. When I am in a bad mood, I talk about it with my friends.
8. If I have a bad day, the last thing I want to do is talk about it.
9. I rarely look for people to talk with when I am having a problem.
10. When I’m distressed I don’t tell anyone.
11. I usually seek out someone to talk to when I am in a bad mood.
12. I am willing to tell others my distressing thoughts.
Appendix H: Social Reaction Questionnaire (SRQ, Ullman, 2000)

Instructions: The following is a list of reactions that other people sometimes have when responding to a person who disclosed their experience of pregnancy loss. Please indicate how often you experienced each of the listed responses from other people following your disclosure of pregnancy loss.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

1. Told you that you were not to blame
2. Told you that you did not do anything wrong
3. Told you it was not your fault
4. Reassured you that you are a good person
5. Held you or told you that you are loved
6. Comforted you by telling you it would be all right or by holding you
7. Spent time with you
8. Listened to your feelings
9. Showed understanding of your experience
10. Reframed the experience as traumatic
11. Saw your side of things and did not make judgements
12. Was able to really accept your account of your experience
13. Told you he/she felt sorry for you
14. Believed your account of what happened
15. Seemed to understand how you were feeling
16. Helped you get medical care
17. Provided information and discussed options
18. Helped you get information of any kind about coping with the experience
19. Encouraged you to seek counseling
Appendix I: The Event Related Rumination Inventory (ERRI; Cann et al., 2011)

After an experience of miscarriage or still birth, people sometimes, but not always, find themselves having thoughts about their experience even though they don’t try to think about it. Indicate for the following items how often, if at all, you had the experiences described in the last couple of weeks.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I thought about the event when I did not mean to.</td>
</tr>
<tr>
<td>2</td>
<td>Thoughts about the event came to mind and I could not stop thinking about them.</td>
</tr>
<tr>
<td>3</td>
<td>Thoughts about the event distracted me or kept me from being able to concentrate.</td>
</tr>
<tr>
<td>4</td>
<td>I could not keep images or thoughts about the event from entering my mind.</td>
</tr>
<tr>
<td>5</td>
<td>Thoughts, memories, or images of the event came to mind even when I did not want them.</td>
</tr>
<tr>
<td>6</td>
<td>Thoughts about the event caused me to relive my experience.</td>
</tr>
<tr>
<td>7</td>
<td>Reminders of the event brought back thoughts about my experience.</td>
</tr>
<tr>
<td>8</td>
<td>I found myself automatically thinking about what had happened.</td>
</tr>
<tr>
<td>9</td>
<td>Other things kept leading me to think about my experience.</td>
</tr>
<tr>
<td>10</td>
<td>I tried not to think about the event, but could not keep the thoughts from my mind.</td>
</tr>
<tr>
<td>11</td>
<td>I thought about whether I could find meaning from my experience.</td>
</tr>
<tr>
<td>12</td>
<td>I thought about whether changes in my life have come from dealing with my experience.</td>
</tr>
<tr>
<td>13</td>
<td>I forced myself to think about my feelings about my experience.</td>
</tr>
<tr>
<td>14</td>
<td>I thought about whether I have learned anything as a result of my experience.</td>
</tr>
<tr>
<td>15</td>
<td>I thought about whether the experience has changed my beliefs about the world.</td>
</tr>
<tr>
<td>16</td>
<td>I thought about the experience might mean for my future.</td>
</tr>
<tr>
<td>17</td>
<td>I thought about whether my relationships with others have changed following my experience.</td>
</tr>
<tr>
<td>18</td>
<td>I forced myself to deal with my feelings about the event.</td>
</tr>
<tr>
<td>19</td>
<td>I deliberately thought about how the event had affected me.</td>
</tr>
<tr>
<td>20</td>
<td>I thought about the event and tried to understand what happened.</td>
</tr>
</tbody>
</table>

Not at all 1 2 3 Often
Appendix J: Prosocial Behavior

1. Since your pregnancy loss, have you volunteered at an organization that supports individuals who have experienced pregnancy loss (e.g. help organize a walk/run, lead a support group, organize a fundraiser etc)?

   ___ Yes  ___No

2. If yes, please describe what type of volunteering work you are/were you involved in.

3. How often have you been doing volunteer work that supports individuals who have experienced pregnancy loss?
   a. Never,
   b. Once or twice a year
   c. Between 1 and 3 days per month
   d. About 1 day per week
   e. Several days a week
   f. Everyday

4. Are you still engaged in volunteer work?

   ___ Yes  ___No

5. How long have you been engaged in the volunteering you described?
   a. Never,
   b. Less than 3 months
   c. Between 3 and 6 months
   d. Between 7 and 11 months
   e. Between 1 and 2 years
   f. Longer than 2 years

6. Since your pregnancy loss have you posted information or comments online that were meant to support individuals who have experienced pregnancy loss (e.g. leaving positive comments on other’s pregnancy loss announcements, making blog entries that provide information and support etc)?

   ___ Yes  ___No

7. If yes, please describe.
8. How often have you been posting information or comments online that are meant to support individuals who have experienced pregnancy loss?
   g. Never,
   h. Once or twice a year
   i. Between 1 and 3 days per month
   j. About 1 day per week
   k. Several days a week
   l. Everyday

9. How long have you been posting information or comments online that are meant to support women who have experienced pregnancy loss?
   g. Never,
   h. Less than 3 months
   i. Between 3 and 6 months
   j. Between 7 and 11 months
   k. Between 1 and 2 years
   l. Longer than 2 years
Appendix K: Interpersonal Reactivity Inventory (IRI; Davis, 1983)

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you using the provided scale. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can.

1. I daydream and fantasize, with some regularity, about things that might happen to me.
2. I often have tender, concerned feelings for people less fortunate than me.
3. I sometimes find it difficult to see things from the "other guy's" point of view.
4. Sometimes I don't feel very sorry for other people when they are having problems.
5. I really get involved with the feelings of the characters in a novel.
6. In emergency situations, I feel apprehensive and ill-at-ease.
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it.
8. I try to look at everybody's side of a disagreement before I make a decision.
9. When I see someone being taken advantage of, I feel kind of protective towards them.
10. I sometimes feel helpless when I am in the middle of a very emotional situation.
11. I sometimes try to understand my friends better by imagining how things look from their perspective.
12. Becoming extremely involved in a good book or movie is somewhat rare for me.
13. When I see someone get hurt, I tend to remain calm.
14. Other people's misfortunes do not usually disturb me a great deal.
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.
16. After seeing a play or movie, I have felt as though I were one of the characters.
17. Being in a tense emotional situation scares me.
18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them.
19. I am usually pretty effective in dealing with emergencies.
20. I am often quite touched by things that I see happen.
21. I believe that there are two sides to every question and try to look at them both.
22. I would describe myself as a pretty soft-hearted person.
23. When I watch a good movie, I can very easily put myself in the place of a leading character.
24. I tend to lose control during emergencies.
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.
27. When I see someone who badly needs help in an emergency, I go to pieces.
28. Before criticizing somebody, I try to imagine how I would feel if I were in their place.
Appendix L: Table and Figures for Manuscript 1

Table 1

Descriptive Statistics and Intercorrelations Among Main Study Variables

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Attachment Anxiety</td>
<td>23.57</td>
<td>7.78</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.Attachment Avoidance</td>
<td>13.52</td>
<td>6.38</td>
<td>.47**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3.DCI Total</td>
<td>130.0</td>
<td>19.29</td>
<td>-.41**</td>
<td>-.57**</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.SCO</td>
<td>15.34</td>
<td>2.69</td>
<td>-.14*</td>
<td>-.48**</td>
<td>.64**</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>5.SDC</td>
<td>18.95</td>
<td>2.61</td>
<td>-.03</td>
<td>-.31**</td>
<td>.55**</td>
<td>.38**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.DDCO</td>
<td>7.93</td>
<td>1.53</td>
<td>-.16*</td>
<td>-.19**</td>
<td>.48**</td>
<td>.32**</td>
<td>.51**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7.SCP</td>
<td>13.06</td>
<td>3.22</td>
<td>-.27**</td>
<td>-.25**</td>
<td>.56**</td>
<td>.30**</td>
<td>.29**</td>
<td>.35**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.SDCP</td>
<td>18.41</td>
<td>4.27</td>
<td>-.37**</td>
<td>-.49**</td>
<td>.85**</td>
<td>.51**</td>
<td>.38**</td>
<td>.31**</td>
<td>.47**</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9.DDCP</td>
<td>7.00</td>
<td>2.01</td>
<td>-.26**</td>
<td>-.38**</td>
<td>.68**</td>
<td>.53**</td>
<td>.32**</td>
<td>.17**</td>
<td>.35**</td>
<td>.66**</td>
<td></td>
<td></td>
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<tr>
<td>10.PTG</td>
<td>52.76</td>
<td>23.48</td>
<td>-.09</td>
<td>.001</td>
<td>.19**</td>
<td>.17**</td>
<td>.15*</td>
<td>.17**</td>
<td>.13</td>
<td>.16*</td>
<td>.14*</td>
<td></td>
</tr>
</tbody>
</table>

Note. PTG=Posttraumatic Growth, DCI Total= Dyadic Coping Inventory Total, SCO= Stress Communicated by Oneself, SDC= Supportive Dyadic Coping by Oneself, DDCO= Delegated Dyadic Coping by Oneself, SCP= Stress Communicated of the Partner, SDCP= Supportive Dyadic Coping of the Partner, DDCP= Delegated Dyadic Coping of the Partner.

*p<.05, **p<.001
Table 2

*Model Summaries and Final Model Regression Coefficients for Hierarchical Multiple Regression Predicting Posttraumatic Growth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>β</th>
<th>LL</th>
<th>UL</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Loss</td>
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<td>.07</td>
<td>-2.59</td>
<td>7.39</td>
<td>.344</td>
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<tr>
<td>Gestational Age</td>
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<td>.06</td>
<td>-.23</td>
<td>.57</td>
<td>.393</td>
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<td>Personhood</td>
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<td>.16</td>
<td>-79.51</td>
<td>-8.12</td>
<td>.025</td>
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<tr>
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<td>.13</td>
<td>-.14</td>
<td>3.41</td>
<td>.072</td>
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<tr>
<td>Sexual Orientation</td>
<td>5.60</td>
<td>.08</td>
<td>-4.06</td>
<td>15.26</td>
<td>.255</td>
</tr>
<tr>
<td>Social Class</td>
<td>4.87</td>
<td>.10</td>
<td>-1.53</td>
<td>11.27</td>
<td>.135</td>
</tr>
<tr>
<td>Attachment Anxiety</td>
<td>-.14</td>
<td>-.05</td>
<td>-.60</td>
<td>.31</td>
<td>.533</td>
</tr>
<tr>
<td>Attachment Avoidance</td>
<td>.61</td>
<td>.17</td>
<td>-.01</td>
<td>1.22</td>
<td>.053</td>
</tr>
<tr>
<td>SCO</td>
<td>1.18</td>
<td>.14</td>
<td>-.24</td>
<td>2.61</td>
<td>.104</td>
</tr>
<tr>
<td>SDC</td>
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<td>.12</td>
<td>-.28</td>
<td>2.51</td>
<td>.117</td>
</tr>
<tr>
<td>DDCO</td>
<td>.70</td>
<td>.05</td>
<td>-1.60</td>
<td>3.00</td>
<td>.550</td>
</tr>
<tr>
<td>SCP</td>
<td>.37</td>
<td>.05</td>
<td>-.68</td>
<td>1.41</td>
<td>.493</td>
</tr>
<tr>
<td>SDCP</td>
<td>.16</td>
<td>.03</td>
<td>-.90</td>
<td>1.21</td>
<td>.769</td>
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<tr>
<td>DDCP</td>
<td>.01</td>
<td>.00</td>
<td>-2.00</td>
<td>2.02</td>
<td>.989</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>R</th>
<th>R² (adjusted)</th>
<th>ΔR²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.35</td>
<td>.12</td>
<td>.12</td>
<td>5.20</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td>.35</td>
<td>.12</td>
<td>.001</td>
<td>3.91</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 3</td>
<td>.42</td>
<td>.18</td>
<td>.06</td>
<td>3.44</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
Note. $\beta =$ standardized regression coefficient; CI = confidence interval; $LL =$ lower limit, $UL =$ upper limit. Adjusted= adjusted $R^2$. SCO= Stress Communicated by Oneself, SDC= Supportive Dyadic Coping by Onself, DDCO= Delegated Dyadic Coping by Onself, SCP= Stress Communicated of the Partner, SDCP= Supportive Dyadic Coping of the Partner, DDCP= Delegated Dyadic Coping of the Partner.
Figure 1

*Dyadic Coping as a Mediator of the Relationship Between Attachment Anxiety and Posttraumatic Growth*

Path ‘a’
\[ b = -0.98, p < 0.001 \]

Path ‘b’
\[ b = 0.21, p = 0.013 \]

Path ‘c’
Direct effects: \[ b = -0.19, p = 0.34 \]
Indirect effects: \[ b = -0.21, 95\% CI [-0.42, -0.03] \]
Figure 2

*Dyadic Coping as a Mediator of the Relationship Between Attachment Avoidance and Posttraumatic Growth*

Path ‘a’

\[ b = -1.83 \ p < .001 \]

Path ‘b’

\[ b = .29 \ p = .002 \]

Path ‘c’

Direct effects: \( b = -.16, \ p = .52 \)

Indirect effects: \( b = -.54, 95\% \text{ CI } [-.99, -.13] \)
Figure 1

*The Hypothesized Moderated Mediation Model*
Table 1

*Descriptive Statistics and Intercorrelations Among Main Study Variables*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DDI</td>
<td>37.90</td>
<td>11.91</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Deliberate Rumination</td>
<td>13.92</td>
<td>9.31</td>
<td>.15*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. SRQ Comp</td>
<td>41.31</td>
<td>12.91</td>
<td>.19**</td>
<td>.22**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. PTG</td>
<td>50.48</td>
<td>22.76</td>
<td>.17*</td>
<td>.42**</td>
<td>.36**</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* PTG=Posttraumatic Growth, DDI=Distress Disclosure Index, SRQ Comp= Social Reactions Composite.

*p<.05, **p<.001
Table 2

*Model Summaries and Final Model Regression Coefficients for Hierarchical Multiple Regression Predicting Posttraumatic Growth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>β</th>
<th>LL</th>
<th>UL</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Since Loss</td>
<td>-.15</td>
<td>-.02</td>
<td>-.86</td>
<td>.57</td>
<td>.687</td>
</tr>
<tr>
<td>Personhood</td>
<td>2.53</td>
<td>.26</td>
<td>1.20</td>
<td>3.86</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Severity</td>
<td>1.16</td>
<td>.10</td>
<td>-.44</td>
<td>2.75</td>
<td>.154</td>
</tr>
<tr>
<td>DDI Total</td>
<td>.27</td>
<td>.14</td>
<td>.02</td>
<td>.51</td>
<td>.031</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>R</th>
<th>R² (adjusted)</th>
<th>ΔR²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.32</td>
<td>.09</td>
<td>.10</td>
<td>8.26</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td>.35</td>
<td>.11</td>
<td>.02</td>
<td>7.48</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Note. β = standardized regression coefficient; CI = confidence interval; LL = lower limit, UL = upper limit. Adjusted= adjusted R². DDI= Distress Disclosure Index Total Score.*
Table 3

**Model Summaries and Final Model Regression Coefficients for Hierarchical Multiple Regression Predicting Deliberate Rumination**

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>$\beta$</th>
<th>LL</th>
<th>UL</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Since Loss</td>
<td>-.51</td>
<td>.15</td>
<td>-.80</td>
<td>-.22</td>
<td>.001</td>
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<tr>
<td>Personhood</td>
<td>.71</td>
<td>.27</td>
<td>.17</td>
<td>1.25</td>
<td>.009</td>
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<tr>
<td>Severity</td>
<td>.76</td>
<td>.33</td>
<td>.11</td>
<td>1.40</td>
<td>.022</td>
</tr>
<tr>
<td>DDI Total</td>
<td>.09</td>
<td>.05</td>
<td>-.01</td>
<td>.18</td>
<td>.083</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>R</th>
<th>$R^2$ (adjusted)</th>
<th>$\Delta R^2$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.35</td>
<td>.11</td>
<td>.12</td>
<td>10.32</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td>.37</td>
<td>.12</td>
<td>.01</td>
<td>8.57</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Note.* $\beta =$ standardized regression coefficient; CI = confidence interval; LL = lower limit, UL = upper limit. Adjusted= adjusted $R^2$. DDI Total= Distress Disclosure Index Total Score.
Figure 1

*Deliberate Rumination as a Mediator of the Relationship Between Disclosure and Posttraumatic Growth*

Path ‘a’
\[ b = .12 \quad p = .01 \]

Path ‘b’
\[ b = .93 \quad p < .001 \]

Path ‘c’
Direct effects: \[ b = .28 \quad p = .03 \]
Indirect effects: \[ b = .11, 95\% \text{ CI} [0.02 - 0.22] \]
Table 4

*Model Summaries and Final Model Regression Coefficients for Hierarchical Multiple Regression Predicting Posttraumatic Growth*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>β</th>
<th>LL</th>
<th>UL</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Since Loss</td>
<td>.18</td>
<td>.03</td>
<td>-.52</td>
<td>.87</td>
<td>.09</td>
</tr>
<tr>
<td>Personhood</td>
<td>2.37</td>
<td>.24</td>
<td>1.11</td>
<td>3.63</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Severity</td>
<td>.87</td>
<td>.07</td>
<td>-.64</td>
<td>2.39</td>
<td>.258</td>
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<tr>
<td>SRQ Comp</td>
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<td>.80</td>
<td>&lt; .001</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regression Model</th>
<th>R</th>
<th>R^2 (adjusted)</th>
<th>ΔR^2</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.32</td>
<td>.09</td>
<td>.10</td>
<td>8.26</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td>.46</td>
<td>.19</td>
<td>.11</td>
<td>14.08</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Note. β = standardized regression coefficient; CI = confidence interval; LL = lower limit, UL = upper limit. Adjusted= adjusted R^2. SRQ Comp= Social Reactions Questionnaire Composite.*
Table 5

*Model Summaries and Final Model Regression Coefficients for Hierarchical Multiple Regression Predicting Deliberate Rumination*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>β</th>
<th>LL</th>
<th>UL</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Since Loss</td>
<td>-.46</td>
<td>-.20</td>
<td>-.75</td>
<td>.16</td>
<td>.002</td>
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<td>Personhood</td>
<td>.71</td>
<td>.18</td>
<td>1.73</td>
<td>1.24</td>
<td>.010</td>
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<tr>
<td>Severity</td>
<td>.70</td>
<td>.14</td>
<td>.06</td>
<td>1.34</td>
<td>.032</td>
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<tr>
<td>SRQ Comp</td>
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<td>.02</td>
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<td>.018</td>
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<table>
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<tr>
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<th>$R^2$ (adjusted)</th>
<th>$\Delta R^2$</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.35</td>
<td>.11</td>
<td>.12</td>
<td>10.32</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Step 2</td>
<td>.38</td>
<td>.13</td>
<td>.02</td>
<td>9.33</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

*Note.* $\beta$ = standardized regression coefficient; CI = confidence interval; LL = lower limit, UL = upper limit. Adjusted = adjusted $R^2$. SRQ Comp = Social Reactions Questionnaire Composite.
Figure 2

*Deliberate Rumination as a Mediator of the Relationship Between Positive Social Reactions and Posttraumatic Growth*

Path ‘a’
\[ b = 0.15, p = 0.002 \]

Path ‘b’
\[ b = 0.98, p < 0.001 \]

Path ‘c’
Direct effects: \[ b = 0.65, p < 0.001 \]
Indirect effects: \[ b = 0.15, 95\% CI [0.05 - 0.27] \]
Figure 3

*Positive Social Reactions as a Mediator of the Relationship Between Disclosure and Deliberate Rumination*

Path ‘a’
\[ b = .19 \quad p = .007 \]

Path ‘b’
\[ b = .14 \quad p = .005 \]

Path ‘c’
Direct effects: \[ b = .11 \quad p = .04 \]
Indirect effects: \[ b = .03 \quad 95\% \text{ CI} \quad [.004, .06] \]
Appendix O: Table and Figures for Manuscript 3

Table 1

*Descriptive Statistics and Intercorrelations Among Main Study Variables*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>1. In-person Frequency</td>
<td>.3</td>
<td>.78</td>
<td>-</td>
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<td></td>
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</tr>
<tr>
<td>2. In-person Duration</td>
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<td>1.60</td>
<td>.74**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Online Frequency</td>
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<td>1.14</td>
<td>.17**</td>
<td>.12</td>
<td>-</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Online Duration</td>
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<td>.22**</td>
<td>.25</td>
<td>.48**</td>
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<tr>
<td>5. IRI</td>
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<td>9.62</td>
<td>.06</td>
<td>.07</td>
<td>.08</td>
<td>.11</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6. PTG</td>
<td>52.81</td>
<td>23.92</td>
<td>.19**</td>
<td>.13*</td>
<td>.09</td>
<td>.06</td>
<td>.13*</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note.* PTG=Posttraumatic Growth, IRI=Empathy, frequency and duration of online or in-person volunteering.

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