### Scientific Abstract: Surviving the dangerous and polluted river of life: The coexisting role of the desire for revenge and forgiveness in facilitating childhood sexual abuse survivors' well-being and health

The salutogenic model of health sees life metaphorically as a dangerous and polluted river in which health and well-being are constantly challenged and through which wellbeing, health and thriving are enhanced by enabling people to gain a sense of coherence, that includes control and manageability over their lives. Childhood sexual abuse (CSA) involves the violation of adult-child boundaries and leaves survivors with a sensation of helplessness. To achieve a sense of coherence, CSA survivors engage in compensatory fantasies such as revenge, the reenactment of the abuse, and dissociation. Although studies have pointed to excessive feelings of injustice and revenge fantasies in CSA survivors, to the best of our knowledge, they have not addressed the potential role of desire for revenge and revenge fantasies in survivors' recovery. In fact, researchers often view revenge as an obstacle to well-being without differentiating between the various types of interpersonal transgressions. Nor do they distinguish between the desire for revenge or the fantasy and its actual enactment. In Western thought, revenge is often seen as the opposite pole to forgiveness, which is seen as contributory to thriving after CSA in the few studies that exist. However, the specific contribution of forgiveness of the self, the offender, and the situation has also been neglected. We hypothesize that the positive contribution of desire for revenge, revenge fantasies, and forgiveness to survivors' sense of coherence and self-esteem will be moderated by a combination of survivors' levels of rumination about the transgression, anger rumination, and dissociation. To achieve a complementary, complex and innovative picture of the complex contribution of revenge and forgiveness to the well-being of CSA survivors, we propose a mixed-methods cross-sectional study designed to examine a conditional model using Structural Equation Modeling (SEM) analysis with 300 CSA adult survivors, from the community and clinical settings. We posit that CSA survivors' engagement in the desire for revenge, revenge fantasies, and forgiveness is likely to facilitate a greater sense of coherence and self-esteem, which will facilitate survivors' well-being and health. The possibility that the combination of these tendencies conditions the model will be examined using Latent Class Analysis (LCA). We will use self-report and physiological measures (hair cortisol) as well as a sub-sample of 30 in depth interviews to gain further insight on the experience of revenge and forgiveness and its use as a means for coping and recovery in CSA survivors. The findings will shed light on the dynamics through which desire for revenge, revenge fantasies, and forgiveness facilitate the well-being and health of CSA adult survivors, thus providing a rich, nuanced, and non-dichotomous approach to better understanding recovery trajectories in CSA adult survivors.

**Surviving the dangerous and polluted river of life: The coexisting role of the desire for revenge and forgiveness in facilitating childhood sexual abuse survivors' wellbeing and health**

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**1a. Scientific Background**

The salutogenic model of health sees life, metaphorically, as a dangerous and polluted river in which wellbeing and health are constantly challenged. Well-being is enhanced by enabling people to increase control over their lives, which can be described by the construct of "sense of coherence" (SOC; Antonovsky, 1987), defined below. Childhood sexual abuse (CSA) is one such dangerous and polluting factor. Defined as a sexual activity (ranging from fondling to sexual intercourse) with a minor, perpetrated by a person significantly older than the child (Hetzel & McCanne, 2005) via coercion, force, or any overt or covert threat (Lalor & Mclvaney, 2010). CSA transcends geographic boundaries and has reached epidemic proportions, ranging from 8% to 31 % for girls and 17 % for boys (see for example, the meta-analysis of [Barth](https://www.ncbi.nlm.nih.gov/pubmed/?term=Barth%20J%5BAuthor%5D&cauthor=true&cauthor_uid=23178922) et al., 2013). CSA includes the violation of the child's body as a "safe private place" eliciting fear of annihilation, damages body-mind integration, demolishes the sense of control and self-worth, and induces a constant threat of the fragmentation of the body and the self (Lev- Wiesel, 2015). Thus, it constitutes a unique traumatic event that is associated with significant, deleterious metal consequences across the lifespan, including, but not limited to, risky sexual behaviors, depression, anxiety, conduct disorder and Post-Traumatic Stress Disorder (PTSD) ([Abajobir et al., 2017](https://www-sciencedirect-com.ezproxy.haifa.ac.il/science/article/pii/S0145213419301309%22%20%5Cl%20%22bib0005);  [McTavish](https://www-sciencedirect-com.ezproxy.haifa.ac.il/science/article/pii/S0145213419301309%22%20%5Cl%20%22%21) et al., 2019; Steine et al., 2017). These effects are also manifested in the body, resulting in a variety of physical indices relating to poor physical health (e.g., increased risk for cardiovascular, increase of inflammatory activity, and auto-immune diseases) (D’Elia et al., 2018) and chronic disease (e.g., fibromyalgia, digestive disorders, Crohn’s disease) [(Gerber et al., 2018; Steine et al., 2017)](https://paperpile.com/c/TCJkZw/BJkkh%2BbgcAq%2BkJQ5i%2BO5hX5%2BHEXGO).

While the life river of CSA survivors is particularly dangerous and polluted, there are salutary factors that may position survivors on the well-being end of the ease/dis-ease continuum. These include consistency (strengthening comprehensibility), the underload-overload balance (strengthening manageability) and participation in valued decision making (strengthening meaningfulness), which constitute the core elements in individuals' Sense of Coherence (SOC) (Antonovsky, 1987; Bauer et al, 2020), defined as a global orientation—a pervasive feeling of confidence that the life events one faces are comprehensible, that one has the resources to cope with the demands of these events, and that these demands are meaningful and worthy of engagement. Since, CSA survivors experience a deep violation of their sense of safety, and their ability to manage and control of their bodies and lives is severely hampered, often by the very individual whose role is to guide and protect them, it is not surprising that they exhibit lower levels of SOC (Watts, 2022).

Typically, survivors use various strategies to gain control. As such, they tend to engage in compensatory fantasies (e.g., fantasies of revenge), unconsciously reenact the abuse, and dissociate (Daphna-Tekoah et al., 2019; Haen & Weber, 2009; Lev-Wiesel, 2015). Therefore, it is important to further understand the role of revenge and forgiveness in assisting in “cleaning the river”, enhancing SOC to increase survivors’ wellbeing and health.

**The Desire for Revenge and Revenge Fantasies**

The desire for revenge is a normative developmental response that first appears in childhood, and is defined as, a wish to cause harm and suffering to another individual who is perceived to have caused damage to oneself (Bloom, 2001; Haen & Webber, 2009, Jackson et al, 2019). It is characterized by resentment, anger, and at times, hatred towards the offender, and stems from the need to regain self-esteem, reinstate justice, and restore emotional equanimity (Tripp et al., 2002; Watson, 2016), which preserves the person's belief in a just world (Berger, 2014; Grobbink et al., 2015). In this sense, the desire for revenge is not destructive in nature but rather constructive and constitutes a form of narcissistic repair, enabling acceptance and redefinition, encourages progression and ego stability (van Denderen et al., 2014; Watson et al., 2016).

Trauma, particularly interpersonal trauma, often shatters the notion of a "just world" (Bloom, 2001). Thus, it is highly likely that restoration of justice through desire of revenge is particularly important for CSA survivors since power and control - the perception of one's ability to influence others - are basic human needs. This notion has been expanded upon the practice of restorative justice (i.e., a theory of justice that emphasizes repairing the harm caused by criminal behavior) in which greater control and empowerment are obtained when the survivor's voices are heard, and perpetrators are held accountable for the aftermaths of the offense (Burns & Sinko, 2021). Several studies have reported a strong desire for revenge and excessive preoccupation with revenge fantasies among children exposed to violence inflicted by peers or strangers (Ardila-Rey et al., 2009) and adult crime victims such as rape, assault, robbery, and deprivation of liberty (Cardozo et al., 2003, 2004; Van Denderen et al., 2014), but to the best of our knowledge, the normative tendency to seek revenge when treated unjustly by another person as a factor promoting recovery has not been studied in CSA survivors.

In addition, only a single study has examined the desire for revenge among sexually abused women and indicated less willingness to forgive and a higher level of desire for revenge among women who experienced sexual and physical abuse than women who had not (Davidson et al., 2013). However, this study did not examine its impact on CSA survivors' psychopathology and wellbeing. Furthermore, they did not differentiate between the desire for revenge; namely, the wish to retaliate for being unjustly treated by another, and the actual act of vengeance (Schumann & Ross, 2010 & Schumann & Walton, 2021). The latter refers to punishing the perpetrator openly and explicitly by causing actual suffering and is destructive because it can enmesh the survivor in an uncontrollable whirlpool of angry rumination and aggression (Berger, 2014; Carlsmith et al., 2008; Schumann & Ross, 2010) and an increased level of PTSD (Van Denderen et al., 2014). Data, treatment protocols, and theoretical conceptualizations have suggested that having a sense of control as compared to feelings of victimization, passivity, helplessness, powerlessness, and fearfulness is vital in empowering CSA survivors (Parry & Simpson, 2016; Puffer et al., 2011), especially in the case of unjust abusive experiences (Zdaniuk & Bobocel, 2012).

Although most people do not actually engage in vengeance (Schumann & Ross, 2010), many tend to fantasize about it after being treated unjustly (Crombag et al., 2003). Revenge fantasies are defined as actual descriptive thoughts/scenes on how to get even with the perpetrator (Haen & Weber, 2009; Horowitz, 2007). From a psychoanalytical perspective, the therapeutic value of revenge fantasies lies in calming the feelings of insult, shame, and humiliation by virtually punishing the perpetrator and settling the score between the victim's suffering and the perpetrator's actions (Lillie & Strelan, 2016; Seebauer et al., 2014). In addition, it directs survivors’ destructive anger outwardly toward the attacker instead of inwards (Berger, 2014; Goldberg, 2004) providing survivors with a kind of pleasure that enables emotional closure and is experienced as ego- syntonic and conscious (Haen & Weber, 2009). Thus, according to Psychoanalytic thought, a desire for revenge is self-protective and stabilizing to the psyche. It signs the beginning of a movement away from narcissistic self-involvement by allowing another person existence enough for blame. Wanting revenge is part of the healing process of hurt and anger. In their imagination, the survivors become active rather than passive, which helps them regain a sense of control and self-esteem (Berger, 2014; Thomas, 2004). The hope of the phantasmatic, vengeful triumph, makes life more bearable and survivors feeling less victims and less helpless. Survivors escape the real world by imagining the world in the way survivors would like it to be in their revenge fantasies. In their fantasies, they control their environment, powerful enough to give their story whatever ending they like (Berger, 2014). As a result, these fantasies serve as a means of self-soothing by reducing anger, frustration, and humiliation (Berger, 2014; Tripp et al., 2002).

The literature enumerates three main types of revenge fantasies (Goldberg, 2004): 1. Gaining justice by inflicting suffering and pain. This fantasy is based on the universal norm of reciprocity in relationships; an "eye for an eye" (Goldberg, 2004; McCullough et al., 2001). 2. Punishment by proxy through formalized judicial, military, or political procedures, shaming in social media and force majeure (Ayvaci et al., 2019; Goldberg, 2004). 3. Revenge through the victim's personal success. For the survivors, their personal success represents the perpetrator’s failure to ruin their life (Rowntree, 2010). However, the differential contribution of these types of revenge fantasies to individuals' wellbeing and psychopathology has not been examined.

Retaliating against the transgressor is often considered negative. A small number of mainly cross- sectional studies have examined the adverse psychological outcomes of the desire for revenge, primarily in laboratory studies with student samples, that elicit insult or humiliation, in which the desire for revenge was reported to be associated with negative emotion and depression, as well as reduced life satisfaction (McCullough et al., 2001; Ysseldyk et al., 2007; Van Denderen et al., 2014). Similarly, the desire for revenge and PTSD symptoms were positively associated among survivors of war exposure (Bayer et al., 2007; Cardozo et al., 2003). However, numerous studies, albeit not necessarily related to traumatization, have reported the empowering benefits of the desire for revenge and revenge fantasies. For example, Crombag et al. (2003) asked students to recall a recent event where they felt the desire to even the score after being harmed. Most of the respondents felt satisfied or triumphant after fantasizing. Zdaniuk and Bobocel (2012) reported that engaging in revenge fantasies in the workplace restored self-esteem. An experimental study revealed that imagined revenge after hypothetical cheating in a romantic relationship led to reduced aggression (Denzler et al., 2009). Retaliating against the transgressor enhanced victims’ feelings of empowerment (Strelan et al., 2020) and an increased sense of justice (Funk et al., 2014). Imagining direct retaliation against the transgressor was related to positive emotion via empowerment (Twardawski et al., 2021).

In the same manner, the clinical literature suggests that ameliorating revenge fantasies in psychotherapy with traumatized clients enhances the integration of traumatic experiences, the regulation of anger, and the acquisition of a sense of restored control, self-esteem, and self-coherence (as opposed to feeling frail or empty) by practicing the illusions of strength (Berger, 2014; Haen & Weber, 2009; Horowitz, 2007). A recent article demonstrated the use of role-playing of revenge scenarios as a tool for enhancing trauma resolution in treating CSA children. Experiencing the role of the aggressor may help CSA clients regain control over the abusive experience and feel valuable and safe again (Iordanou, 2019). Thus, the desire for revenge and fantasy, in and of themselves, may not be negative for victims per se. Associations between cortisol reactivity and revenge have been found in physical abuse survivors (Ysseldyk et al., 2019). To the best of our knowledge, studies on the relationship between revenge fantasies or the desire for revenge and hair cortisol or HRV have not been conducted; however, some studies refer to forgiveness as an absence of revenge.

**Forgiveness**

Forgiveness, like revenge, can be life-sustaining (Goldberg, 2004), and is associated with positive feelings of compassion and empathy. Forgiveness is seen as a change towards more positive and less negative thoughts and feelings about an individual who inflicted intentional harm (McCullough et al., 2006), or towards the self or the offensive situation (Thompson et al., 2005). Though there is a certain confusion on the precise definition of forgiveness, in general, forgiveness is defined as the positive transformation of a set of interrelated affective, cognitive, behavioral, and motivational reactions that survivors experience in response to a transgressor (Exline et al., 2003). While some researchers view forgiving as overcoming resentment and withholding retaliation against the offender, cultivating benevolence, and experiencing love-based emotions toward the offender that may motivate reconciliation (Exline et al., 2003; Wade & Worthington, 2003), others view forgiveness in terms of reductions of negative emotions that arise after ruminating about a transgression or downplaying the transgression itself (Fatfouta et al., 2015). The latter also refers to letting go of the right to hurt the offender or accepting the occurrence of bad things (e.g., interpersonal transgressions) (Thompson et al., 2005). Survivors of sexual abuse often attribute the cause of the assault to themselves, demonstrating self-contempt and self- blame. This tendency emphasizes the importance of self-forgiveness for CSA survivors to overcome trauma (Gerlsma & Lugtmeyer, 2018).

Several reasons (i.e., moral reasoning, the wish to avoid bitterness and anger, executing control over the abusive situation while reasserting personal power, and relinquishing the self-as-victim perspective) can lead to the letting go of personal retribution. In this sense, forgiveness appears to give survivors a sense of empowerment and control as they can overcome negative feelings toward the offender such as hatred and anger (Akhtar et al., 2017). However, letting go of negative emotions does not necessarily include the letting go of justice, which would involve reconciliation, trust, or release from legal accountability. Forgiveness also differs from suppression, which involves avoiding the experience and expression of anger but not ridding oneself of the internal desire for revenge (Exline et al., 2003; Jacinto & Edwards, 2011).

Despite the variance in definitions, the literature over the past 25 years points to the potential of forgiveness in helping people who have experienced deep emotional pain related to unjust treatment by others (Schumann & Walton, 2021; Strelan & Wojtysiak, 2009), thus suggesting there are links between forgiveness and more satisfactory outcomes for the survivor. Forgiveness is associated with enhanced mental and physical health such as reduced hostility, depression, and stress (Griffin et al., 2015; May et al., 2014, Waltman et al., 2009). Not forgiving, hampers the regulation of emotions, harboring anger and anxiety and has negative physiological effects to the neuro-immune and cardiovascular systems (Worthington & Scherer, 2004).

A meta-analytic review of process-based forgiveness interventions in clinical populations revealed promising results in achieving clinical treatment goals. In most cases, participants in intervention programs experienced fewer negative emotions, such as depression and anxiety, and higher positive emotions such as hope and self-esteem (Lundahl et al., 2008). In a recent meta-analysis, forgiveness was found to be associated with psychological health and physiological outcomes, such as heart rate, but not in cases where PTSD was present (Rassmussen et al, 2019). Thus, engaging in forgiveness is assumed to lead to a halt in anger rumination, lower stress levels and the restoration of wellbeing.

There is scant literature on the mechanism of forgiveness as an alternative coping strategy to promote healing among CSA survivors (Ha et al., 2019; Tener & Eisikovits, 2017). Forgiveness to the self and others can be seen to obtain control and manageability of the situation and release the self from the controlling grasp of anger and rumination, and a means to increase sense of coherence. A recent study that applied forgiveness therapy in sexually assaulted women reported a significant reduction in shame and depression and an increase in post-traumatic growth (Ha et al., 2019). Others underscored the importance of obtaining forgiveness from the environment (community) to CSA women's recovery (Tener & Eisikovits, 2017). These qualitative findings underscore the need for the further examination of the contribution of forgiveness among CSA survivors in quantitative or mixed-methods studies. Some offenses might be harder to forgive than others (Gerlsma & Lugtmeyer, 2018; Rapske et al., 2010). This is especially true for CSA survivors given the ambivalence surrounding the legitimacy of forgiving perpetrators of sex offenses towards children. Some suggest that CSA, especially intrafamilial sexual abuse, should be regarded as an unpardonable transgression (Gerlsma & Lugtmeyer, 2018) and that it is unethical to expect the victim to forgive the offender. Thus, it is vital to examine forgiveness towards the offender and forgiveness of the self (i.e., sympathizing with the self and treating oneself with acceptance and love) and the situation (Thompson et al., 2005), seperately. This study will examine the specific contribution of forgiveness to the self, the situation, and the perpetrator to survivors' sense of coherence enhancing their wellbeing, health, and reduce psychopathology.

**Contradictory or Complementary Functions? The Proposed Model**

Western thought tends to see the desire for revenge and forgiveness as opposite ends of a continuum in which the desire for revenge is considered as immoral, irrational, and a form of mental illness, while forgiveness is seen as the cure (Goldberg, 2004). This may be attributed to the close links between the desire for revenge, violence, rumination, and PTSD symptoms and between forgiveness, positive emotions, and life satisfaction (Barcaccia et al., 2020; McCullough et al., 2013). However, the conceptualization of revenge and forgiveness as polar opposites has been criticized for negating important positive aspects of revenge, such as seeking justice (Ho et al., 2002). The two constructs are not simple opposites, and neither can be viewed as the pure absence of the other (Brown, 2003, 2004). Furthermore, less is known regarding the positive emotions of revenge (Chester & Martelli, 2020). The missing link in the association between revenge and psychopathology is the role of rumination and anger rumination which may mask the positive aspects of the desire for revenge (Barcaccia et al., 2020).

Note: Although we do not assume direct associations, we will also examine direct associations between the predicting and the outcomes variables.

Furthermore, both desire for revenge and forgiveness can serve as adaptive coping mechanisms with complementary functions to cope with harm and injustice (Goldberg, 2004; McCullough et al., 2013). Whereas revenge mechanisms are designed to deter future harm to the self by imposing future costs upon the avenger or by weighing injustice, forgiveness aims to maintain the relationship despite the past harm (McCullough et al., 2013). Empirically, studies have shown that the forgiving and vengeful dispositions are only moderately negatively correlated (Wade & Worthington, 2003; Ysseldyk et al., 2007). A recent study demonstrated the potential role of both revenge and forgiveness in promoting a sense of humanness, although the benefits of forgiveness were greater (Schumann & Walton, 2021).

Drawing on this complementary standpoint and given the lack of quantitative studies on the role of the desire for revenge and forgiveness in CSA survivors, the current study will examine the joint contribution of the desire for revenge, revenge fantasies and forgiveness as potential coping strategies for CSA adult survivors using a conditional process modeling (Bachl, 2017) which will examine the possibility that participants' levels of desire for revenge, revenge fantasies, and forgiveness facilitate their sense of coherence and self-esteem, which in turn will facilitate their well-being and health and decrease psychopathology. Further, it will investigate the possibility that the model is conditioned by different participants' profiles comprised of their levels of rumination over the transgression, anger rumination and dissociation (for the model, see Figure 1).

**The Mediating Role of Sense of Coherence (SOC)**

Our model suggests that engaging in the desire for revenge, fantasies of revenge, and forgiveness towards the self and the situation will contribute survivors' SOC. Based on Antonovsky's salutogenic theory (1987), SOC serves as a primary motivator for health in the context of adversity and involves three concepts: (1) comprehensibility, the certainty that one can reasonably anticipate events that occur in one's environment; (2) manageability, the extent to which one believes that one's actions fulfill one's needs; and (3) meaning, the capacity to find some aspect of the environment worthy of personal investment (Antonovsky, 1987). High SOC helps copes successfully with different types of personal and collective crises and thus can help people enjoy elevated levels of perceived physical health, fewer health complaints (Flensborg-Madsen et al., 2005) and better mental health outcomes in the general population (Schäfer et al., 2019; Nosheen et al., 2017) and in CSA survivors (Mc Gee et al., 2018). The reason that SOC potentially mediates the relationship between revenge, forgiveness and physical and mental health, lays in the potential of forgiveness and fantasies of revenge to instill comprehensibility, manageability and meaning to the chaotic experience of CSA that once robbed the individual of this sense.

**The Moderating Role of Rumination over Transgression, Anger Rumination and Dissociation**

Although the desire for revenge and forgiveness are seen as adaptive responses in the current study, the adaptability of these responses may vary according to individual characteristics (e.g., Fatfouta et al., 2015; Lillie & Strelan, 2016). Trauma survivors may exhibit several maladaptive tendencies to deal with the aftermath of abuse including rumination over transgression, anger rumination, and dissociation. Rumination over the transgression involves repetitious unintentional thinking that emerges during and continues after the offense, and is characterized by the re-enactment of the offensive episode in the mind. In some cases, it includes continuous fantasizing about how to violently retaliate against the transgressor and aims to maintain the goals of vengeance, teaching the offender a lesson and offsetting the injustice (Barber et al., 2005; McCullough et al., 2001; Wade et al., 2008). Evidence, mostly from students, indicates that the tendency toward rumination (i.e., individuals' disposition for repetitive and recurrent self- focused thinking about failure and depressed mood) (Barber et al., 2005; Lucas et al., 2010) and rumination over transgression (i.e., rumination about the specific offense) (Fatfouta et al., 2015; Wade et al., 2008) interferes with people's abilities to forgive the transgression. These authors suggest that adverse emotional reactions (e.g., anger, shame, or fear) after the offense are transformed into amalgams of lingering bitterness and vengefulness that make forgiveness less likely (Wade et al., 2008).

In some cases, it is associated with rumination of anger which is defined as the propensity to repetitively think about past situations that provoked anger at the time (Fernandez et al., 2010; Sukhodolsky et al., 2001). Anger has shown moderately strong relationships with history of traumatic events in general and with and sexual victimization history, in particular (Sadeh & McNeil, 2013). Anger rumination is posited to be the mechanism activating the stress response (through the cardiovascular responses), leading to poor physical and mental health (Busch et al., 2017). During angry rumination, anger is re-provoked by the repeated focus on the causes and consequences of an anger provoking incident and can lead to a cycle of violence that transforms victims into perpetrators (Denson, 2013; McCullough et al., 2013). Thus, being caught within anger rumination and rumination over the transgression is likely to interfere with the positive effects of the associations between desire for revenge and forgiveness and participants' SOC, thus impairing their well-being.

Dissociation is another maladaptive coping mechanism which CSA survivors tend to use as a natural automatic self-protective response to overwhelming experiences (Lahav & Elklit, 2016). According to the DSM-5, dissociation in its' grave form is defined as interference in the normal integrative functions of awareness, memory, identity, emotion, behavior, perception of the self, the body, and the environment, as manifested in an altered sense of time, out-of-body experiences, de-realization, depersonalization, feeling disconnected from one's body, and feeling confused or disoriented. The classical approach regards dissociation as a pathological response to trauma in which the victim splits daily reality into the part in which he/she functions properly and the abuse experience (Nijenhuis et al., 2010). The two parts of the self, the one that acknowledges the harm and the one detached from it, are thought to operate on various levels of consciousness. It involves a disconnection between the traumatic event and ordinary consciousness, leading to detachment from oneself, numbness, and distortions in perceptions of reality and time (Briere, 2006) and can exacerbate survivors’ emotional distress (Spiegel et al., 2011). In addition, dissociation hampers the ability to play and fantasize as it aims toward increasing safety and containment (Davise, 1997).

Since the desire for revenge and forgiveness involve the memory of the transgression, emotions stemming from the offense and imaginary scenarios, we suggest that an individual with a higher level of dissociation will have difficulty engaging in fantasies of revenge and forgiveness. These individuals are likely to have higher levels of psychopathology in addition to the dissociation and lower levels of wellbeing and health. Furthermore, emotional pain is unbearable, as in the case of CSA, the body may alternately take the toll (Anderson, 2017; Lane et al., 2018). Thus, higher levels of dissociation and a lower desire for revenge as well as forgiveness may also be related to higher cortisol levels.

**Severity of the Abuse**

The characteristics of the abuse can influence the use of desire for revenge and forgiveness such that the longer and more severe the violent experiences were, there will be greater the desire for revenge (Ardila-Rey et al., 2009) and less forgiveness (Gerlsma & Lugtmeyer, 2018). A single study, which examined differences in desire for revenge and forgiveness among sexually assaulted women compared to non-assaulted women, reported lower willingness to forgive and a higher desire for revenge in the sexually assaulted group (Davidson et al., 2013). It is thus plausible that survivors who have experienced prolonged, more violent sexual abuse, which included penetration and incest will have higher levels of desire for revenge and revenge fantasies, and less forgiveness.

**Outcomes: Psychopathology, Wellbeing, Physical Stress and Perceived Health**

CSA serves as a significant risk factor for PTSD symptoms (Maniglio, 2010; Hailes et al., 2019), depression (Abajobir et al., 2017; McTavish et al., 2019), stress, and health problems, which are aggravated with the severity, frequency, and duration of abuse. PTSD symptoms (not necessarily the full diagnosis), refer to a wide range of mental or behavioral symptoms that develop among people who experienced traumatic events such as sexual violence and are aggregated into four groups: intrusion, avoidance, negative alterations in cognition and mood, and alterations in arousal and reactivity (Pai et al., 2017). Depression refers to intense psychic suffering, consisting of depressed mood, inner tension, restlessness, and aimless psychomotor agitation characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation (Paykel, 2020). Furthermore, early stress on the hypothalamic-pituitary-adrenal (HPA) axis and higher salivary cortisol levels (a marker of stress) were found in CSA survivors (Friedman et al., 2007; Schalinski et al., 2015). Steeper elevations in hair cortisol levels (a marker of continued stress) were associated with early life adversity (Oresta et al., 2021; Stalder et al., 2017). In contrast, low levels of well-being (defined as the experience of positive emotions such as happiness and contentment as well as the development of one’s potential, having some control over one’s life, having a sense of purpose, and experiencing positive relationships were found among CSA survivors (Sigurdardottir & Halldorsdottir, 2013).

**b. Research objectives and expected significance**

The proposed study has three objectives. (1) To develop a complementary theoretical model to better understand the joint contribution of the desire for revenge, revenge fantasies, and forgiveness to CSA survivors’ elevated well-being, psychopathology, and health through the mechanism of sense of coherence. (2) To examine the moderating role of rumination of the transgression, rumination of anger and dissociation on the path model by identify profiles of survivors based on these characteristics who are more likely to have higher well-being based on their tendency for rumination and dissociation. (3) To examine levels of survivors' wellbeing, physical health, and psychopathology according to type of fantasy (see page 3). (4) To use women’s narratives to better understand CSA’s experience of forgiveness and revenge as a way of coping with CSA consequences and its relationship with their SOC and perceived health and well-being.

**Significance of the Proposed Study**

Studies that examine the joint contribution of desire for revenge and forgiveness in sexually abuse survivors are relatively rare. Hence, our model, which includes both constructs, is original and points to the importance of an innovative association between the desire for revenge and forgiveness that takes a complex, non-dichotomous approach beyond the notion of desire for revenge as negative and forgiveness as positive in CSA survivors' adjustment. Our model provides a rich, in-depth understanding of the possible contribution of SOC and survivors’ personal characteristics that may affect the relationship between desire for revenge, fantasies of revenge, and forgiveness to survivors' well-being, health status and psychopathology. In addition, CSA survivors’ narratives will shed light on their experience and meaning making process of revenge and forgiveness and its complex relationships with their recovery. Recovery in this aspect is defined as the ways in which individuals have the ability to reconcile their abuse history, establish a new identity, and navigate complex intrapsychic and social processes (Sinko et al, 2021). Establishing the empirical validation of the model can pave the way to further examination of additional trauma populations. Furthermore, since the “body keeps the score” for trauma survivors in general, and for CSA survivors, proposing a model that integrates psychological and physiological outcomes will have direct theoretical and clinical implications.

**1c. Detailed description of the proposed research**

This project will implement a mixed-methods cross-sectional and qualitative study design using Structural Equation Modeling (SEM) analysis on a sample of survivors of CSA and in-depth-semi structured interviews with a sub-sample of survivors.

**1ci Working hypothesis**

Our working hypothesis posits that engaging with the desire for revenge, revenge fantasies and forgiveness may serve as active ingredients in CSA survivors’ recovery, by providing an opportunity to regain a sense of coherence, which will increase their wellbeing and health and lessen distress symptoms. This process will be conditioned by the moderating role of dissociation and rumination and will vary across groups of participants who manifest different aggregations of these personal characteristics.

More specifically, we hypothesize that: H1: Higher levels of desire for revenge, revenge fantasies, and forgiveness will be positively associated with higher levels of SOC. Consequently, participants' SOC will be positively associated with higher levels of well-being and health and lessened levels of post-traumatic distress symptoms and depression among CSA survivors. H2: Participants with higher levels of rumination of the transgression, anger rumination, and dissociation will have a negative association between revenge, revenge fantasies, and SOC, and thus will have lower levels of well-being, perceived health, and higher psychopathology and hair cortisol. Exploratory hypothesis: In addition, and separately from the SEM model, we will examine the possibility that distinct levels of survivors' well-being, perceived health, hair cortisol, and psychopathology will be associated with the type of fantasy (gaining justice, punishment by proxy, revenge through the victim's success).

**1cii Research Design and Methods**

**Participants and Procedure**

Participants will be 300 CSA adult survivors (over the age 18). In order to obtain a representative sample in regard to the severity of the abuse and our outcome measures, 130 participants will be recruited through social media, and online support forums for sexual abuse survivors, and 130 participants will be recruited through clinical settings, such as welfare services, or treatments centers (i.e. Lotem). After signing the online informed consent participants will have the option of answering questions online and sending us the hair cortisol in the mail as described below or having a home visit by our research assistant to answer the questionnaire and provide the hair sample. The questionnaire will query about their demographic details and will ask to refer to their CSA experience(s) in regard to: abuse characteristics, the predicting variables (desire for revenge, fantasies of revenge and forgiveness), and the moderating variables (rumination over transgression, anger rumination, and dissociation). Furthermore, they answer validated questionnaires regarding the mechanistic variable (SOC), and the outcome variables (well-being, psychopathology, and perceived physical health). If participants are mailing their hair sample, they will be asked to provide their address in a separate secured google form. The research assistant will mail them a stamped envelope and instructions for the provision of one centimeter of hair for the cortisol analysis (detailed below). Furthermore, participants will be asked if they are willing to participate in a semi-structured interview regarding the experience of revenge and forgiveness in relation to the CSA and coping with this experience.

The sample size was determined based on the lower-bound sample size for SEM models, as a function of the ratio (r) between the number of indicator variables and the number of latent variables (Westland, 2010, pp. 477). The formula used for this calculation is as follows: n ≥ 50r2 - 450r +1100, in which r is the ratio of indicator variables to latent variables, and the online calculator took an effect size of 0.3, and 0.95 statistical power into account (Soper, 2022). In the proposed study, the number of indicator variables is 19 (including age, ethnicity, gender, and time since the abuse) and the number of the latent variables (revenge, forgiveness, and psychopathology) is 3. Thus, r = 6.33, and the calculated sample size is 256. Because we know that not all participants may agree to provide hair for the cortisol analysis, we will recruit a minimum of 300 participants to suffice the recommended sample size for model structure of 256. Participants will be compensated for their time, with a gift card worth 150 NIS and an additional 100 NIS for those who will be interviewed (see below).

In addition, a subgroup of 30 participants (15 clinical and 15 community) will be invited to take part in a semi-structured interview. This sample size is recommended in qualitative research to achieve saturation in complex phenomena (Mason, 2010). Participants who agree to be interviewed will provide contact information in a separate secured google form. Ethical approval will be obtained from the Committee to Evaluate Human Subjects Research of the Faculty of Health and Welfare at the University of Haifa. We will inform participants that their participation is voluntary, and they can withdraw from the study at any time without penalties.

**Analytic Approach**

To examine H1 structural equation modeling in MPLUS package (Muthén & Muthén, 2017) will be conducted. To test H2 Latent Class Analysis (LCA) (Muthén & Muthén, 2000) will be run to identify the number of unobserved homogenous subgroups at the individual level using the following continuous indicators to inform latent class membership: rumination over transgression, anger rumination and dissociation. To identify the best-fitting model, we will use the four-stage sequential modeling strategy. Model fit of the competing models will be compared using the Bayesian Information Criterion (BIC) (Schwarz, 1978). Classification quality of the competing models will be assessed using entropy (Ramaswamy et al., 1993). Models will be evaluated and compared according to interpretability of the obtained solutions. Once the ideal number of clusters is determined, a series of multi-group analyses will be performed between pairs of clusters to examine differences in the path estimations. In case of missing values we will use full-information maximum likelihood (FIML) estimation, which allows for dependent variable missing data under missing at random (MAR) assumption with the robust maximum likelihood estimator (MLR), which uses model-based methods to accommodate our complex survey data. Participants with >20% missing data will be excluded (Graham, 2009). For the qualitative analysis, the principles of Interpretative Phenomenological Analysis as defined in the Smith et al. (2009) guidelines will be implemented to analyze the interviews. This approach enables the understanding of how individuals in particular contexts make sense of a given lived experience phenomenon. We will also use the consolidated criteria for reporting qualitative research (COREQ) checklist (Tong et al., 2007).

**Quantitative Measures**

Self-report questionnaires and physiological data will be used to test the model. All the self-report scales have been used in Israeli samples and have shown good reliability and validity.

**Control Variables:** The model will be controlled for sociodemographic variables of age, gender, and ethnicity as well as for other characteristics of the abuse such as time since the abuse.

**Predictive variables:**

**The Desire for Revenge**. The desire for revenge subscale from the Transgression-Related Interpersonal Motivations inventory (TRIM; McCullough et al., 1998) consists of five items assessing the respondents' agreement to statements regarding the desire to seek revenge against someone who committed a specific transgression against them (α=.85-.93). Items are rated on a 5-point Likert scale (1=strongly disagree to 5= strongly agree).

**Revenge Fantasy**. The modified version for adults of the Revenge Fantasy Inventory for Adolescents (RFI-J; Warncke et al., 2015; Goldner et al., 2019) will be used to assess fantasies for revenge. The inventory consists of two sections. The first (18 items, α =.90) deals with feelings and thoughts about revenge fantasies for past injustices, whereas the second (6 items, α =.90) deals with imagined revenge fantasies. Items are rated on a 4-point Likert-type scale (1= does not apply to 4 = fully applies). In addition, to identify the type of fantasy (i.e., inflicting pain and suffering by the survivor, by proxy, or by gaining success) participants will be asked to write a short description of their revenge fantasy. Narratives will be coded by two coders separately to obtain interrater reliability.

**Forgiveness**. Forgiveness of the self, the situation and others will be assessed using the Heartland Forgiveness Scale (HFS; Thompson et al., 2005). The 18 items (α =.75-.86) are rated on a 7-point Likert-type scale (1= Almost always false to 7 = Almost always true).

**Severity of the Abuse.** Participants will report the abuse characteristics in terms of violence inflicted duration of the abuse, intra/out familial abuse, single/multiple abuses, single/multiple abusers, and bodily penetration. A total score will be calculated to indicate the severity.

**Outcome Variables:**

**Well-being**. The Brief Inventory of Thriving (BIT; Su et al., 2014) assesses comprehensive well-being on 10 items (α =.71-.96), rated on a 5-point Likert scale (1= strongly disagree to 5 = strongly agree).

**Perceived physical health**. The Short-Form Health Survey (SF-12; Ware et al., 1996) is a 12-item measure assessing physical health. Most items are rated on a 5-point Likert scale, while items related to the frequency of physical activities are rated on a 3-point scale (α =.70-.72).

**Physiological Stress-Hair Cortisol**. The samples will be collected from the posterior vertex area of the head as close as possible to the scalp. Hair growth is approximately one centimeter per month so that cortisol measured in the hair close to the scalp is estimated to indicate HPA axis activity in the previous month. Thus, extraction and analysis of cortisol in hair provides a good non-invasive retrospective quantification model (Greff et al., 2019). Before analysis, the samples will be washed twice in isopropanol and after drying, ground to a fine powder to break up the hair's protein matrix and increase the surface area for extraction. Cortisol is extracted into methanol, the methanol is evaporated, and the extract is reconstituted in an assay buffer which is analyzed with an ELISA kit. Concentration per mg of powdered hair weight correlates with a picogram of cortisol per milliliter.

**PTSD symptoms**. The PTSD Checklist for DSM-5 (Blevins, 2015) corresponding to the DSM-V criteria is a 20 items scale making up four sub-scales: invasive experience (5 items), avoidance (2 items), changes in cognitive function and mood (7 items), and hyperarousal (5 items). Participants rate the extent to which they are bothered by the problem described on a five-point Likert scale (0 = not at all to 4 = extremely) (α =.94-.95).

**Depression**. The Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001) is a 9-item based on the diagnostic criteria in the DSM-IV and is rated on a four-point scale according to severity of the symptoms (0 = not at all to 3 = nearly every day) (score range = 0–27). Scores of 5, 10, 15, and 20 represented mild, moderate, moderately severe, and severe depression (α =.78).

**Mechanistic variables:**

**Sense of coherence (SOC).** The 13-item Orientation to Life Questionnaire comprising meaningfulness (4 items), comprehensibility (5 items), and manageability (4 items) (Antonovsky, 1987) will assess participants’ SOC. Responses are made on a 7-point semantic differential scale (1= very seldom or never to 7 = very often) (α =.91-95).

**Moderating Variables:**

**Rumination over transgression**. The Rumination about an Interpersonal Offense Scale (RIO; Wade et al., 2008) asks participants to think back over a specific hurtful experience and indicate their agreement with the statements using six items (α =.79-.90). Items are rated on a 5-point scale (1= strongly disagree to 5 = strongly agree).

**Anger Rumination**. The Angry After Thoughts subscale from the Anger Rumination Scale (ARS; Sukhodolsky et al., 2001) measures the tendency to focus attention on angry moods, recall past anger episodes, and think over the causes and consequences of anger episodes using six items rated on a 4-point- Likert type scale (1= almost never to 4 = almost always) (α =.86).

**Dissociation.** The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) assesses the intensity and frequency of dissociative symptoms of detachment, amnesia, and experiences of de-personalization on 28 items. Participants are asked to indicate the percentage of time they experienced each symptom in the past month on a 0% (never) to 100% (always) scale (α =.84).

**Qualitative tool:**

We will conduct a semi-structured interview using an interview protocol developed for this study. The protocol includes questions designed to obtain in depth information about survivors’ desire for revenge, fantasies of revenge, and forgiveness as potential strategies they have used to cope with the abuse. They will be asked to describe the content of the fantasies and feelings of forgiveness in detail, the contexts in which they are evoked, their motivations and dilemmas, the meanings ascribed to these thoughts and feelings, the ways in which these facilitate or hinder their coping.

**1ciii Preliminary Results**

Our team has conducted two cross sectional studies that examined the relationships between revenge and injustice in CSA survivors. The first study, with 278 young adults, found that a feeling of injustice mediated the relationship between the number of previous traumatic events and the desire for revenge, revenge fantasies and the perception of revenge fantasies as helpful (Goldner et al., 2019) (see figures 2-3). In the second study, in a sample of 56 CSA children, feelings of injustice were positively correlated with the desire for revenge and revenge fantasies, depression, anxiety, and dissociation (r=.37-50, p <.001). These correlations were higher among children whose abuse included sexual intercourse. In addition, the level of revenge fantasy (B =.31, p =.00) positively predicted the children's sense of competence. The contribution of children's revenge fantasies (B = -.03, p =.03) or desire for revenge (B = -.03, p =.02) to their self-competence was moderated by amnesia (a subscale of dissociation), in which revenge fantasy (B = -.11, p = .01) or desire for revenge (B = -.13, p = .003) negatively predicted self-competence among children with higher amnesia. These findings point to the potential of desire for revenge and fantasy for revenge to enhance CSA survivors' self- competence and the complex nuanced relationships between the variables.



**1civ. Conditions for Research**

The infrastructure, the PIs' experience, and laboratory conditions for conducting this study are outstanding. Dr. Goldner is currently the Head of the Emili Sagol Creative Arts Therapies Research Center & The Sagol Laboratory for Children at Risk at the University of Haifa. She is an expert in emotional abuse and gender-based violence and has published roughly 50 peer-reviewed papers. Dr. Czamanski-Cohen is a senior lecturer at the Faculty of Social Welfare and Health Sciences at the University of Haifa. She concentrates on studying women’s health by conducting psychosomatic research. She completed an NIH-funded RO1 clinical trial, which also collected biological specimens. Her laboratory has all the necessary equipment required to conduct hair cortisol and HRV analyses. Prof. Daphna-Tekoah, is a senior social worker and the head of the Faculty of Social Work at the Ashkelon College. She is an expert on sexual abuse, trauma, and PTG and has published peer-reviewed papers, books, and chapters on these issues.

**1cv. Expected Results and Pitfalls**

We expect the results of this study to shed light on the complex relationship between revenge and forgiveness in CSA survivors and to provide a multidimensional understanding of CSA survivors’ experience and coping strategies that is well-grounded in current theory but differs from the current binary view that assigns the roles of revenge and forgiveness to opposite poles and will integrate psychological and physiological measures. The following are the potential pitfalls: 1) We will be collecting data from participants who self-identify as CSA survivors, and it can be assumed that this population will be difficult to recruit. However, PI’s Drs. Goldner and Czamanski-Cohen have achievements in obtaining large and physiological data with high-risk populations and Prof. Daphna- Tekoa acquaintance with key figures in CSA survivors' assistance centers. 2) Since recalling the traumatic event and responding to questionnaires that pertain to trauma may elicit distress, we will closely monitor the distress levels of participants. Clinical M.A. students will be hired and trained to set up and conduct the data collection and follow up with participants with high PTSD (+1) SD above the mean) or depression scores above the clinical cutoff point. We will refer those participants to further professional support in the community. We will also request that participants with lingering distress contact us for a referral for treatment. In summary, we believe that the prospective risks to the project's objectives are negligible given the clinical and research experience of the researchers and their familiarity with complex statistical techniques, which they have used extensively in their studies.

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