"Forgotten Children": Siblings of Adolescents with Eating Disorders

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CERTIFICATE OF APPROVAL

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Honors Thesis

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Abstract

Almost 30 million individuals in the United States will have an eating disorder in their lifetime. Of those 30 million, 10,200 individuals will die a year as a direct result of the eating disorder (Deloitte Access Economics, 2020). To discover a way to help those suffering, there has been research into a variety of treatment options. One of the most common treatments is Family-Based Therapy which often dives into the parent and diagnosed child's relationship. In this form of treatment there is often little focus on the impact of the diagnosis on the sibling(s). In this study we will be analyzing adults who grew up with an adolescent sibling diagnosed with an eating disorder. These adolescents diagnosed with an eating disorder are known throughout this study as AEDs. These siblings are known throughout this study as "forgotten children".

Our main goal of this research is to examine, qualify, and describe the experiences of siblings of adolescents diagnosed with an eating disorder. In doing so, this study will investigate whether the siblings of AEDs have been impacted, negatively or positively, into adulthood due to the disorder. It will also serve to quantify the impact of the diagnosis and resulting experiences using a variety of measurement metrics including depression, anxiety, coping skills, perseverance, resilience, personality traits, and drug usage. The researchers will investigate correlations between the measurement metrics to reveal relationships specific to siblings of AEDs. The results of this study will give researchers a better understanding of these siblings as well more insight on the familial element of the disorder. The results will also serve as a reflection of these siblings and allow their voices and experiences to be heard.

"Forgotten Children": Growing Up With a Sibling Diagnosed with an Eating Disorder

Eating disorders come in many different forms, in different body shapes and sizes, and can occur at any age. Nine percent of the United States will have an eating disorder in their lifetime (Deloitte Access Economics, 2020). While this is not the most prolific mental illness, it is incredibly dangerous because "eating disorders have the highest mortality rate of any mental illness" ("Eating Disorder Statistics"). This means that AEDs, ages 15-24 years old, are 10 times more at risk of dying than others their age. The most frequent causes of death being internal organ shut down, cachexia, and collapse of the circulatory system resulting from malnutrition (Fichter & Quadflieg, 2016). These frightening statistics are even scarier to families who have an adolescent with an eating disorder.

Research has found that when treating an eating disorder there are "significantly better outcomes when treated with family treatment compared with individual supportive therapy" (Lock & Le Grange, 2005, p.S65). Therefore, when adolescents are diagnosed with an eating disorder they are often treated, in part, using family therapy. Family based therapy for adolescents with eating disorders is based on the Maudsley method originating at the Maudsley Hospital in London (Lock & Le Grange, 2005, p. S64). The method is intended to prevent the patient from being submitted to an inpatient program and instead focusing on the tools of the family (Le Grange & Lock). In the Maudsley method the use of the family is seen as the most effective treatment since they are an integral part of helping the child recover (Dalle Grave, 2019, p. 2). However when treating a mental illness, social worker Young (2007) claims, "... it could be contended that our primary focus has been on the parent–child relationship and that the sibling relationship is on the periphery" (p. 21). This means that there is a population of siblings that were forgotten in the waiting rooms of treatment centers. This research focuses on what

happens to the other sibling(s) when one child's survival becomes the sole focus? This study will examine eight metrics; perseverance, BIG 5 personality traits, self-efficacy, drug use, anxiety, depression, resilient coping, and coping skills to give a deeper look into who these "forgotten children" are.

Despite all of the people in the world with siblings and the millions that suffer from mental health disorders, researchers Piekunka and Whitlow (2018) say "'The sibling perspective is rarely discussed or studied'" when examining mental health disorders. Their research serves to highlight Young's (2007) statement that, "At worst these relationships may have been taken for granted rather than analyzed" (Young, 2007, p. 21) which implies the unseen benefits of having a sibling. Much of the research that focuses on a sibling perspective is that of siblings of an adolescent diagnosed with any mental illness (e.g. Barnett & Hunter, 2012; Greenberg et al., 1999; Sanders et al., 2014). Even further, the very few studies that do focus on the siblings of AEDs do not use adult participants who are reflecting on their previous experiences in combination with quantifiable data (e.g Callio & Gustafsson, 2016; Garley & Johnson, 1994). These studies also do not utilize longitudinal design to examine adjustment throughout a sibling's life. These flaws leave an aching gap in the research and a group of siblings left feeling alone.

For example, research conducted by Areemit et al. (2010) focused on the experience of siblings of adolescents with eating disorders but solely between the ages of 10-18 years old while using both quantitative scales and focus group interviews. Areemit et al.'s (2010) study found that for the majority of these siblings, their quality of life was negatively impacted after the AED was diagnosed. Researcher Quish (2010) conducted a qualitative study using personal narrative and a semi-structured interview to detail the siblings' "discovery and progression" (p. 1) of the

adolescent's eating disorder. Quish's (2010) research highlighted strong emotions from these sibling's regarding the AED including anger, guilt, and sadness. Quish's (2010) study also emphasized the use of coping mechanisms as escape behaviors for these siblings, especially the need for separation between the disorder and the AED. Our research will work to combine the methods presented by Quish (2010) and Areemit et al. (2010) to analyze siblings of AEDs in a new and crucial way. Our research intends to focus on these siblings once they have reached adulthood and highlight the impact of their childhood experiences using qualitative and quantitative data.

There are rarely any people we spend more time with "from a lifespan perspective" (Young, 2007, p. 21) than our siblings. We often have more time with them than our "parents, partners, and our own Offspring." (p. 21). This time can be a gift as siblings can create unbreakable bonds and mutual understanding that is unrivaled. However, the closeness that is created between siblings can become dangerous when sibling loyalty outweighs honesty about eating behaviors. Research conducted by Areemit et al. (2010) found that siblings of adolescents with an eating disorder would witness their sick sibling lie to their parents about what they ate. The sibling would be "reluctant" (p. 572) to reveal the truth because of their "loyalty" (p. 572). Torn between sibling and parents, these elements of "negotiation, secrecy, and lies" (p. 572) creates for a stressful environment. This leads to heightening tensions around "meal times, meal planning, and family activities" (p. 572). The conflicting loyalty required the sibling to attempt a balancing act by keeping the AED's secrets but not wanting to support their sibling's poor behavior (Maon et al., 2020). These dual roles adds an additional burden onto the sibling and in turn decreases quality of life.

When examining the more prolific area on studies of siblings "of individuals with other severe mental illness" (Maon et al., 2020, p. 2) that are similar in severity to an eating disorder, such as schizophrenia or bipolar disorder, it is crucial to note that these siblings report negative emotions. The siblings also reported impacts on sense of self and family relationships. The feelings of "grief, guilt, fear, and worry" (Maon et al., 2020, p. 2) are the same feelings that siblings of AEDs often report. According to research conducted by Areemit et al. (2010), negative effects experienced by siblings of adolescents with eating disorders include not only the same feelings reported above but also include sorrow, loss, jealousy, shame, anger, and resentment (p. 569). It has been reported that being a sibling of an adolescent with a mental illness puts one more at risk of developing emotional, social, and behavioral impairments (Maon et al., 2020, p. 2). Instances of this can be seen in the interviews conducted by Quish (2010) which found that some of the siblings were beginning to show potential for their own eating issues, with two participants having reported trying to restrict or repress food intake (p. 38).

Researcher Berrettini (2004) found that "greater than 50 percent of the variance in liability to eating disorders and disordered eating behaviors can be accounted for by additive genetic effects" (p. 24) and the remaining variance is from "unique rather than common environmental effects" (p. 24). While this shows that there are genetic factors involved in eating disorders, solely being genetically predisposed to a condition may not necessarily mean an individual will have the condition. The emotional factors, like stress, of having a sibling diagnosed with an eating disorder can "serve as catalysts for the development of psychopathology" (Maon et al., 2020, p. 2) however, often in combination with environmental and genetic factors shared among siblings.

One of the major themes that research in this field has revealed is responsibility. Studies by Areemit et al. (2010), Quish (2010), and Maon et al. (2020) all conclude that siblings of adolescents diagnosed with an eating disorder feel a level of responsibility in caring for and supporting the AED and the parents. Areemit et al. (2010) found that in supporting the family, the sibling had to grow up and take on parental duties like "actively monitoring activity levels and supervising meals" (p. 572) for the AED. Qualitative research by Quish (2010) found that one sibling felt so responsible that they would monitor the AED and "where she was at day to day or hour to hour" (p. 35) at the height of the disorder. For this particular sibling that meant watching her eat, if she's exercising, how much she weighs, how she is feeling, and trying to get a better understanding of the situation (Quish, 2010, p. 35). This kind of responsible behavior is especially common in siblings that are older than the AED (Maon et al., 2020, p. 6).

Another hat that siblings wear is that of a mediator working to settle tension between sibling and parents and to provide support to the entire family (Maon et al., 2020, p. 6). Not only do these siblings feel responsible to the AED, they also "reported feeling worried for their parents' well-being and feeling responsible for them" (Maon et al., 2020, p. 6). While the roles placed onto these siblings may have been overwhelming and stressful (Withers et al., 2014, p. 54), looking back on their experiences many siblings believed that it helped to make them "more resilient, mature and responsible" (Maon et al., 2020 p. 5) as well as more compassionate and "empathetic towards psychological difficulties" (Maon et al., 2020, p. 5).

However, it is participant's personal statements that make it clear how deeply siblings of adolescents diagnosed with an eating disorder are affected. It is important to note that studies have shown just how pervasive an eating disorder is in a family's life. Many siblings report that the family revolved around the AED, the disorder was "omnipresent, affecting every aspect of

daily life and reigning family routine and conduct" (Maon, 2020 p. 5). The all-encompassing nature of the AED often left the siblings feeling forgotten. This is made clear across many siblings' statements. An interview conducted by Quish (2010) recorded one participant that felt that it was always about her sister, the one that was diagnosed with an eating disorder. The sibling said, "My sister took so much of my family's attention and emotion during those years...so much maintenance and support to get her through the day" (p. 28). This statement reflects the feelings found in a statement from a study by Young (2007), a 13 year old sibling claiming that their family only talked about her diagnosed sister which made her feel "unheard above the worry" (p. 25).

Across studies participants report the AED having all the focus of the parents which often made them feel "unnoticed and rejected" (Maon, 2020, p. 6). A lack of attention from parents results in the sibling becoming "the undemanding, silent child" (Areemit et al., 2010, p. 572) because they did not want to cause further disruption to the family (Piekunka, 2018). One way to help these siblings when they are feeling forgotten is to include the sibling in "knowledge of the illness, the status of the disorder, and the treatment" (Areemit et al., 2010, p. 574). Involving the sibling can help boost their well-being especially as the length of the disorder has been found to the related to the sibling's well-being (Maon et al., 2020, p. 7).

It is true across many continents, according to Young (2007), that children are impacted by "sibling experiences" (p. 21) including their sibling's mental illness. Witnessing a loved one in danger can be highly traumatic, siblings claiming they "felt unable to express any emotion that would bring attention to themselves" (Areemit et al. 2010, p. 572). These siblings can be seen as "'secondary victims'" (Quish, 2010, p. 7), having experienced grief, sacrifice, loss of family, of childhood, of a sibling, and of themselves (Maon, 2020, p. 3). These experiences often result in

the sibling needing individual therapeutic counseling themselves due to the traumatic nature of their experiences of having a sibling with an eating disorder (Maon, 2020, p. 6).

One common form of treatment for eating disorders is family based therapy. In interviews done by Quish (2010), participants made sure to highlight the importance of this form of treatment especially stressing "the importance of participation in family therapy by not only the parents, but older and younger siblings as well" (p. 39). Some studies found however, that some siblings did not want to be involved in the treatment, yet most conclude that siblings strongly want to be included, feeling forgotten when they are not included (Maon et al., 2020). The reason siblings want to participate in treatment is hope. According to Moan et al.'s research (202), siblings that attended therapy with their family felt more hopeful and understood the treatment process.

A specialty that siblings of AEDs have developed is a heightened sensitization towards the AED's personal body image. This means that siblings became alert to the "AEDs' food choices, eating mechanics, and weight reduction behaviors" (Areemit et al., 2010, p. 571). The siblings also became more aware of potentially harmful statements about bodies, even becoming more attune to negative language about body shapes and sizes (Areemit et al., 2010, p. 571). This is just one more effect that eating disorders have on siblings of the loved one that is suffering. To mitigate the emotional impact that the situation has on these siblings, they utilize a variety of coping strategies.

Siblings can develop negative and positive coping strategies and these can have an effect on their development and well-being. This study will analyze the participants coping strategies. Coping strategies are methods that are intended to help deal with stressful situations by

mitigating the emotional and psychological toll (Freire et al., 2016). Stress has shown to be harmful to the brain. Research has shown that when exposed to chronic stress, adolescent brains structurally change. Therefore adolescent brains, when exposed to chronic stress, may process the world differently, especially regarding emotion (Romeo, 2017). The impacts on development and structure of the brain due to chronic stress can negatively alter the prefrontal cortex, amygdala, and hippocampus (Romeo, 2017) which are connected to learning, memory, emotions like fear, behavior, and attention. There are a variety of coping styles to help reduce the experience of stress on the brain.

Coping strategies can be identified by type and then further divided into approach coping styles or avoidant coping styles (Friere et al., 2016) as well as adaptive or maladaptive styles (Carver, 19997). The adaptive styles, which reduce stress, are active coping, planning, positive reframing, acceptance, humor, religion, emotional support, and instrumental supports (Moore et al., 2011). The maladaptive styles, which can increase stress, are self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame (Moore et al., 2011). According to research by Freire et al. (2016), the approach strategies are considered "more adaptive" (p. 2) techniques which are more likely to improve well-being.

There are a series of factors that have been shown to influence whether or not a sibling of an AED adopted approach coping or avoidant coping styles. Research by Quish (2010) found sibling coping was to "escape" (p. 47) the experiences of having a sibling with an eating disorder. Research on the topic has found that the coping styles used by siblings of AEDs range across the spectrum of healthy styles. Many participants in siblings of AED research have revealed their coping styles to be mostly healthy. The main subscales used included the use of emotional support, active coping, and planning. Some siblings reported more negative behaviors

including substance use and self-harm (Quish, 2010). Research reports that the coping method of externalizing the illness which is separating the adolescent from the eating disorder via education of eating disorders was frequently practiced according to research by Dimitropoulos et al. (2009), Quish (2010), and Maon et al. (2020). Siblings that have been previously studied highlighted the importance of such education as a way to connect with the AED and better understand the stressful situation (Maon et al., 2020).

Siblings also focused on seeking emotional support whether from friends or romantic partners (Maon et al., 2020) though many tried to require as little attention as possible often denying or repressing emotional expression in direct response to the AED's immediate need for assistance. Therefore, these siblings felt as if they needed more attention but concealed their worry and stress for the sake of their parents. Despite the majority of siblings reporting healthy coping strategies, the most dangerous of the coping styles reported was using prescription medication to suppress appetite, therefore engaging in their own disordered eating behaviors. Due to the limited research on this topic, it is unclear if it is their own eating disorder or if the sibling would not receive the same diagnosis. It is clear however, that both female and older siblings that chose to be more directly involved with the AED were "more exposed" (Maon et al., 2020, p. 7) to the impact of the disorder and more likely to require the use of coping skills.

These coping strategies have been found to have different levels of relative stability, with the strongest stability "found for religion ($r = 0.77$; $p < 0.001$) and humor ($r = 0.55$; $p < 0.001$). Yet, high relative stability was also found for substance use ($r = 0.53$; $p < 0.001$), using emotional support ($r = 0.52$; $p < 0.001$) and self-blaming ($r = 0.51$; $p < 0.001$). Behavioral disengagement ($i = 0.28$; $p < 0.001$), acceptance ($r = 0.38$; $p < 0.001$), and denial ($r = 0.38$; $p < 0.001$) showed the lowest stability" (Nielsen & Knardahl, 2014, p. 145). Nielsen and Knardahl

(2014) also concluded that these strategies still may be subject to change over time. Therefore, our participant's survey results for coping strategies may have been the same as when they were a child but they may also have strengthened, weakened, or changed due to their experiences as they developed.

The research has made it obvious that siblings of AED's are experiencing a highly stressful environment that penetrates into every aspect of their daily life. They utilize coping skills to manage their emotional reaction during stressful situations. It is predicted in our study, that there will be a positive relationship between adaptive coping strategies and well-being which will be indicated by participant's scores on the survey. The survey measured for self-efficacy, perseverance, anxiety, depression, resilience, and personality traits. For this hypothesis to be true, we would find that adaptive coping strategies would be significantly and positively correlated with perseverance, self-efficacy, resilience, extraversion, conscientiousness, openness, and agreeableness as research has concluded that in high levels they are related to positive well-being. According to research by Vainio & Daukantaite (2016) perseverance is significantly and positively correlated with well-being. According to Mguni et al. (2012), resilience and well-being are strongly, positively correlated. Similarly high levels in extraversion, agreeableness, and conscientiousness are related to a high level of well-being, and the reverse was also found to be true (Soto, 2012).

We also predict that the inverse will be true and there will be a negative relationship between the maladaptive coping strategies and well-being. For this hypothesis to be true, it requires maladaptive coping strategies be significantly and negatively correlated with perseverance, self-efficacy, resilience, extraversion, conscientiousness, openness, and agreeableness. It also would mean maladaptive coping strategies were significantly and

positively related to anxiety and depression because Malone and Wachholtz (2018) found that high levels of these psychological variables were significantly correlated with low levels of well-being. Similarly, it has been reported by Mguni et al. (2012), that low levels of resilience were correlated with low levels of well-being.

Method

Procedure

The participants in this study initially took the survey assessment after reading the consent form and consenting to be part of the study. The survey asked if the participant would be willing to take part in a follow-up interview. The follow-up interview was conducted within a one-month timeframe after completion of the survey.

The interviews were conducted via Microsoft Teams. The interview's audio was record and then transcribed. The interviews consisted of an introduction on behalf of the research team and a reminder to the participants that they only need answer what they felt comfortable with. The interviews were comprised of 26 semi-structured questions, allowing for the participant to give as much relevant information as possible. Some of the interview questions were pulled from research conducted by Quish (2010) and the rest were developed by our research team. An example of one of these is "Have your coping strategies changed over time?" The full list of questions can be found in Appendix A.

To ensure that the sample is representative of siblings of adolescents diagnosed with an eating disorder, the participants were recruited via online posts that included the mandatory study requirements. The first question, after consent, used in this study's survey was a yes/no question

that asked “Do you have a sibling that was diagnosed with an eating disorder before they reached the age of 18 years old?”. This question required an answer of yes for the individual to enter into the survey and become a participant. This study utilized a non-probability based sampling method, purposive sampling, where the participants are part of specific population that is asked to voluntarily participate. This type of sampling method however, does include some bias, such as volunteer bias. This means that the results of the research may reflect a specific part of the population that is willing to participate in research.

Participants

Survey

This study was comprised of 105 participants. Of the 105 responses, 5 were removed for leaving the majority of questions blank. Participants that only had a few questions left blank were still included in the final analyses using mean replacement. Of the 95 participants analyzed, 64 (67.4%) identified their gender as male and 31 (32.6%) identified as female. Of the participants analyzed, all male participant data was collected via Mechanical Turk. Of the 31 females, 22 were collected from MTurk and the remainder were collected from the community. This study contained only adults, 18 years of age or older. The participants ranged from 18 – 62 years old. The ages can be found in Appendix B. Participants were asked to identify their ethnicity and the majority of participants identifying as white (67.4%). The total ethnicity chart can be found in Appendix C.

Interviews

Of the 95 participants included in the study, 48 of them agreed to take part in the follow-up survey while 46 answered no and one participant choose not to answer. However, after

reaching out to schedule the interviews, only three participants responded to take part. All three of those participants identified their ethnicity as white and gender as female in their surveys and all three were between the ages of 18-24. All of the participants have a sibling that was diagnosed with an eating disorder before the age of 18. All the participants speak English. Two out of three of these participants had a sibling that was diagnosed with Anorexia Nervosa while one AED was diagnosed with an Eating Disorder Not Otherwise Specified (EDNOS).

Measures

Emotion

The Beck Anxiety Inventory (BAI), created by Beck et al. (1988), measures clinical levels of anxiety ranging from low to severe. The scale features 21 common symptoms of anxiety. The participant were asked to indicate how often they have been impacted by the anxiety symptom in the past month using a Likert scale ranging from 0, (Not at all) to 3, (Severely-it bothered me a lot). An example of one of the items on the scale is "Fear of worst happening" (Beck et al., 1988). According to Beck et al. (1988), Cronbach's alpha for the BAI is .92, making the scale reliable. The researchers also found that "BAI was moderately correlated with the revised Hamilton Anxiety Rating Scale (.51), and mildly correlated with the Hamilton Depression Rating Scale (.25)" (Beck et al., 1988, p. 893) making the BAI a commonly used tool for measuring anxiety. Oh et al. (2018) concluded, when researching the clinical utility of the BAI in Korea, that the inventory was a reliable and valid tool for both "clinical and non-clinical populations." In this study, the reliability analysis found Cronbach's alpha to be .940.

The Patient Health Questionnaire-9 (PHQ-9) developed by Kroenke et al. (2003), is a diagnostic tool to assess the severity of depression using the diagnostic criteria outlined in the

DSM-IV. The questionnaire has 9 items and utilizes a Likert scale with answers ranging from 0 (Not at all), to 3 (Nearly every day). The questionnaire asks the participant to rate, on the scale, how frequently they have been aware of an item. An example of one of the items is, “Feeling down, depressed, or hopeless” (Kroenke et al., 2003). The PHQ-9 has high internal reliability with a Cronbach’s alpha of .89 and the questionnaire is strongly correlated with the Mental Health Inventory (MHI-5) (Kroenke et al., 2003). This questionnaire is widely used for both clinical and research purposes. Our research ran a reliability analysis for the PHQ and the Cronbach’s alpha is .852.

Resilience

The GRIT - S Scale, created by Duckworth and Quinn (2009), measures perseverance which is a related behavior to self-efficacy. This scale features eight items using a 1 (Not at all like me,) to 5 (Very much like me) Likert scale. An example of one of the items on this scale is “I finish whatever I begin” (Duckworth & Quinn, 2009). This scale was designed for the general population and was not intended for use by children younger than 10. For this scale, Cronbach’s alphas ranged from .73 to .83 (Duckworth & Quinn, 2009) making this a reliable scale. In our study, however, the Cronbach’s alpha for the GRIT-S scale was .579. This reliability will be discussed later in this paper.

The Generalized Self-Efficacy Scale, created by Schwarzer and Jerusalem (1995), measures self-efficacy. This scale features ten items using a 1, (Not at all true) to 4 (Exactly true) Likert scale. An example of one of the items on this scale is, “If I am in trouble, I can usually think of a solution” (Schwarzer & Jerusalem, 1995). This scale was designed for the general population from adolescents through the life span. However, there are no participants allowed

below the age of 12. The Generalized Self-Efficacy Scale has been used across 23 countries and "Cronbach's alphas ranged from .76 to .90, with the majority in the high .80s" (Scholz et al., 2002) making this scale reliable. For our study, a reliability analysis was conducted and the Cronbach's alpha was .758.

The Brief Resilient Coping Scale was developed by Sinclair and Wallston (2004) and was intended to assess an individual's ability "to bounce back or recover from stress" (Smith et al., 2008, p. 194). The scale is comprised of 4 items and utilizes a Likert scale ranging from 1, (Does not describe me at all) to 5, (Describes me very well). The participants are asked to rank, on the scale, how well the items describe them. An example of one of the items is, "I believe I can grow in positive ways by dealing with difficult situations" (Sinclair & Wallston, 2004, p. 98). The scale is considered reliable with Sinclair and Wallston (2004) finding Cronbach's alpha ranging from .64 to .71 for internal consistency (p. 97). However, our study's reliability analysis found Cronbach's alpha to be .325. This reliability will be examined further in this study.

Substance Use

The Drug Abuse Screening Test (DAST), created by Skinner (1982), measures the "degree of problems or consequences related to drug abuse" (p. 4). The lower the score the less evidence of drug issues. The larger scale has 20 items, however, Skinner also created a shortened version with 10 items. The DAST-10 asks 10 questions with yes/no answers. An example of one of the items is, "Are you always able to stop using drugs when you want to?" (Skinner, 1982). Skinner (1982) found that the DAST-10 had an internal consistency reliability of .92 and correlated highly with the DAST-20 (.9) making the DAST–10 highly reliable and valid for use. Our study found the Cronbach's alpha for the DAST-10 to be .851.

Personality Traits

The Big Five Inventory-10 (BFI-10), developed by Rammstedt and John (2006), is a multidimensional personality inventory that measures the "'Big Five' personality dimensions" (John & Srivastava, 1999, p. 103) which are extraversion, agreeableness, conscientiousness, neuroticism, and openness. The original scale, by researchers John and Srivastava (1999), was 44 items, however, Rammstedt and John (2006) developed a shorter version that is only 10 items. The inventory uses a Likert scale for participants to rate how the items describe their personality with answers ranging from 1, (Disagree strongly) to 5, (Agree strongly). One of the items, for example, is "I see myself as someone who...is generally trusting" (Rammstedt & John, 2006). The 10 item inventory correlated is .83 with the BFI-44 and the researchers concluded that the "results indicate that the BFI –10 scales retain significant levels of reliability and validity" (Rammstedt & John, 2006, p. 203). According to our analysis, Cronbach's alpha for the BFI-10 was .142. The individual subscales' reliability follows; Extraversion (.396), Agreeableness (.136), Conscientiousness (.041), Neuroticism (.091), Openness (.030). The reliability of all of the measures will be explored further below.

Coping Strategies

The Brief-COPE questionnaire was developed by Carver (1997) and is intended to identify coping strategies among participants. The questionnaire is made up of 28 items and uses a Likert scale with answers ranging from 1, (I haven't been doing this at all) to 4, (I've been doing this a lot). The questionnaire asks the participant to rate how often they have been doing each item. An example of one of the items is, "I've been getting help and advice from other people" (Carver, 1997, p. 96). The questionnaire includes 14 subscales as follows; self-

distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame (Carver, 1997). The Brief-COPE questionnaire is reliable, with each subscale measuring Cronbach's Alpha as follows; Venting (.50), Denial (.54), Acceptance (.57), Instrumental support (.64), Positive Reframing (.64), Behavioral Disengagement (.65), Active coping (.68), Self-blame (.69), Emotional support (.71), Self-distraction (.71), Planning (.73), Humor (.73), Religion (.82), Substance use (.90) (Carver, 1997, p. 96). The analyses indicate an internally reliable questionnaire. Carver (1997) also concluded, after running factor analyses, that the Brief-COPE was "generally consistent" (p. 98) with the full length COPE questionnaire. Carver (1997) also highlights that the questionnaire is incredibly flexible as it can be used to indicate past or present coping styles. Our study conducted a reliability analysis for the full scale and for each subscale. The Cronbach's alpha for the total scale is .850. Cronbach's alpha for each subscale follows; Self-distraction (.40), Active coping (.419), Denial (.60), Substance use (.670), Emotional support (.520), Instrumental support (.396), Behavioral disengagement (.413), Venting (.329), Positive reframing (.513), Planning (.564), Humor (.614), Acceptance (.483), Religion (.621), Self-blame (.484). The reliability of these subscales will be examined further in this study.

Analytic Plan

This study is a descriptive correlational survey design. Descriptive statistics were used to find central tendency and the distribution of the result. Correlations will be run between the following scales; the GRIT scale that measures level of perseverance, the General Self-Efficacy Scale that measures level of self-efficacy, the Beck Anxiety Inventory that measures level of anxiety, the Shortened Big Five Inventory that measures for the BIG-5 personality traits, the

Drug Abuse Screening Test-10 which measured for level of drug use, the Patient Health Questionnaire-9 which measures level of depression, and the Brief-COPE questionnaire which measures for coping strategies. The study is designed to determine if there are relationships between the measurement metrics.

Qualitative analysis techniques were used with the interview data to identify themes among the participant's answers. The interviews were examined for coping techniques and similarities were identified. The interview results can also be used to support the statistical findings from the study's survey.

Results

Survey Results

Descriptive statistical analyses were conducted using SPSS software to compute the total score on each subscale. Participant's scores for each subscale were averaged and the means for each scale are found in their sections below.

After the descriptive analyses were conducted, Pearson's correlations were run to identify significant relationships between adaptive and maladaptive coping strategies and the psychological factors assessed in the research survey (Perseverance, self-efficacy, anxiety, depression, resilience, substance use, and personality traits). See Table A for correlation results. The following variables were significantly related to adaptive coping styles at the less than .01 level; self-efficacy, resilience, substance use. The following variables were significantly related to adaptive coping styles at the less than .05 level; anxiety, depression, extraversion. The following variables were significantly related to maladaptive coping styles at the less than .01 level; perseverance, anxiety, depression, resilience, substance use, and conscientiousness. The

only variable significantly related to maladaptive coping styles at the less than .05 level was self-efficacy.

Next, individual Pearson's correlations were run on each subscale of the COPE scale and the other metrics. The subscales were divided into maladaptive and adaptive total scales. See Table B for maladaptive coping strategies and Table C for adaptive coping strategies.

Emotion

The results for the descriptive statistics were as follows; Beck Anxiety Inventory (M = 29.96, SD = 13.82124), PHQ Depression (M = 14.20, SD = 3.13514). Anxiety was positively correlated with all six maladaptive coping styles. Depression was positively correlated with four out of six maladaptive coping strategies; Denial, substance use, behavioral disengagement, and self-blame. See Table B for Pearson's Correlation. Anxiety was positively correlated with two out of eight adaptive coping techniques; Planning and humor. Depression was positively correlated with one out of eight adaptive coping strategies; Humor. See Table C for Pearson's Correlation. Our study's average score for the Beck Anxiety Inventory was 29.96 out of 63, putting the average sibling of an AED in the moderate anxiety range. Our study's average score for the PHQ scale was 14.2 out of 27, which is the moderate depression range.

Resilience

The results for the descriptive statistics are as follows; GRIT Perseverance (M = 3.0908, SD = .51424), Self-Efficacy (M = 28.9993, SD = 4.33740), BREIF Resilience (M = 14.3216, SD = 2.01716). Results show that for siblings of adolescents with eating disorders, perseverance was negatively correlated with five out of six maladaptive coping techniques: all but self-distraction. Self-efficacy was positively correlated with two out of six maladaptive coping

strategies; self-distraction and substance use. Resilience was positively correlated with three out of six maladaptive coping strategies; Self-distraction, denial, and substance use. See Table B for Pearson's Correlation.

This study found that for siblings of adolescents with an eating disorder perseverance was not correlated with any adaptive coping styles. Self-efficacy was positively correlated with six out of eight adaptive coping styles: all but humor and religion. Resilience was positively correlated with seven out of eight adaptive coping strategies: all but religion. See Table C for Pearson's Correlation.

The average score for the sample on the Grit-S Scale was three out of five. Duckworth, who invented the scale, found the average of their sample (adults ages 25+) to be 3.44 (2009). Both our study's average and Duckworth's average fall under moderately gritty. The average score for our study's sample on the Self-efficacy scale was twenty nine out of forty. This matches the international average for self-efficacy which is 29.5 (Generalized Self-efficacy Scale, 2021). Our study's average score for the Brief Resilient Coping Scale was 14, or medium resilient, which is the same range for the average scores from Kocalevent et al.'s (2017) research.

Substance Use

Then a descriptive analysis was run for the DAST Drug-Use (M = 23.1954, SD = 5.67462). Substance use was positively correlated with all six maladaptive coping strategies. See Table B for Pearson's Correlation. Substance use was positive correlated with four out of eight adaptive coping strategies; Active coping, planning, humor, and instrumental support. See Table C for Pearson's Correlation. Our study's average score for the DAST was four out of ten which is moderate level of substance use.

Personality Traits

Descriptive statistical analyses were also run on each subscale of the Big Five Inventory Scale. The averages for each subscale are as follows; BFI Extraversion (M = 5.6980, SD = 1.47024), BFI Agreeableness (M= 6.3326, SD = 1.57389), BFI Conscientiousness (M= 6.7263, SD = 1.51897). BFI Neuroticism (M = 6.1199, SD = 1.51083), BFI Openness (M = 6.3053, SD = 1.59836). Extraversion was positively correlated with one maladaptive coping style; Denial. Agreeableness was negatively correlated with two out of six maladaptive coping techniques; Venting and substance use. Conscientiousness was negatively correlated with five out of six maladaptive coping techniques: all but self-distraction. Neuroticism was positively correlated with one out of six maladaptive coping strategy; Self-distraction. Openness was negatively corelated with one out of six maladaptive copings styles; Venting. See Table B for Pearson's Correlation.

Extraversion was positively correlated with two out of eight adaptive coping styles; Emotional support and planning. Agreeable was negatively correlated with one out of eight adaptive coping strategies; Humor. Conscientiousness was negatively correlated with two out of eight adaptive coping styles- Humor and instrumental support- and positively correlated with one out of eight adaptive coping strategies; Acceptance. Neuroticism was not correlated with any adaptive coping styles and openness was positively correlated with one out of eight adaptive coping styles; Planning. See Table C for Pearson's Correlation.

Coping Strategies

Next, descriptive analyses were run on the COPE subscales. The averages for each subscale are as follows; Self Distraction (M= 5.6947, SD = 1.27224), Active Coping (M =

5.7037, SD = 1.09972), Denial (M = 5.0859, SD = 1.63439), Substance Use (M = 4.8986, 1.72562), Emotional Support (M = 5.5454, SD = 1.28577), Instrumental Support (M = 5.3928, SD = 1.30012), Behavioral Disengagement (M = 5.1053, SD = 1.44011), Venting (M = 5.2632, SD = 1.35435), Positive Reframing (M = 5.4080, SD = 1.45968), Planning (M = 5.4080, SD = 1.37340), Humor (M = 5.3542, SD = 1.58283), Acceptance (M = 5.5684, SD = 1.31806), Religion (M = 5.6396, SD = 1.61521), Self-blame (M = 5.5656, SD = 1.52498). These subscales were divided into adaptive and maladaptive total scales and then descriptive analyses were run on each total. The averages for these total scales are as follows; Adaptive (M = 44.1805, SD = 6.07404), Maladaptive (M = 31.6133, SD = 6.14324). See Table A for Pearson's Correlation for the relationship between the psychological variables and adaptive and maladaptive coping strategies.

Interview Results

Follow-up interviews were conducted with three voluntary participants. The research team performed a qualitative analysis on the three volunteer interviews and identified 9 main themes that supported the survey results. These themes include familial role, support, coping strategies, personal impact, involvement, forgotten siblings, love, responsibility, and professional treatment. The themes, definitions, and supporting quotations from the interview can be found in Table D.

Multiple similarities were found across the interviews as the participants identified a similar role in the family, two of the participants feeling as if they were the "peacemaker" of the family. Another similarity that was shared between the participants was that they all received personal, professional treatment via a therapist, one interviewee noting that they attended therapy

because they “had depression for a while, so it was very hard.” For white female siblings between the ages of 18-24 of adolescents diagnosed with an eating disorder, seeking individual treatment separate from the sibling and their illness may be more common than other ethnic, gender, or age ranges. Despite diverse levels of involvement in their sibling’s treatment, all three siblings shared similar emotional experiences due to the stress and worry associated with watching a loved one struggle. They made note that despite the effort needed to help their sibling, it is worth it to still have their sibling alive.

When comparing the survey results between the interviewees and the rest of the sample, the results show that the interviewees reported lower levels of depression and substance use than the average of the sample but did not report far from the averages for the rest of the psychological variable scores. Therefore, the interviewees may serve to stand for the rest of the sample.

Discussion

Survey Discussion

The results of the surveys and interviews collected made transparent the struggle, the pain, and the purpose of siblings of adolescents with eating disorders. When examining how the psychological variables and adaptive and maladaptive coping strategies were correlated it is important to note the different profiles that emerged, showing how truly diverse human coping is through the lens of a sibling of an adolescent diagnosed with an eating disorder.

The first hypothesis predicted a positive relationship between adaptive coping strategies and psychological well-being. This would be reflected in the participant's scores on the survey. However, our data shows that while adaptive coping strategies were correlated with some of the

variables that indicate well-being, but not all of them. Therefore, the first hypothesis cannot be confirmed. In some cases the results showed the opposite of what would be expected as far as positive and negative correlations go, making it clear that more research needs to be conducted in this area. These correlations will be further explored later in this discussion.

The second hypothesis predicted a negative relationship between maladaptive coping strategies and psychological well-being. This would be measured by the participant's survey scores. Results showed that different subscales produce different outcomes than the total scales; adaptive and maladaptive coping strategies. The results show more complexities among the coping strategies of siblings of adolescents with eating disorders than the hypotheses predicted.

Emotion

Both anxiety and depression were significantly correlated with both adaptive coping strategies and maladaptive coping strategies. Research shows that learning how to use more adaptive coping strategies results in lower levels of anxiety and depression (Kennedy et al., 2003). This coincides with the results of this survey showing that anxiety and depression were more significantly correlated with maladaptive strategies than adaptive ones. This is supported by Garcia et al. (2018) who concluded that “maladaptive strategies have been found to be related to perceived stress” (p. 3) which can increase anxiety and depression (Andrews & Wilding, 2004). Research has found that maladaptive coping strategies were “associated with psychological distress” (McWilliams et al., 2003, p. 1381) and the researchers found the inverse to be true of adaptive coping strategies.

When these psychological variables are analyzed across the subscales, anxiety is positively and significantly correlated with all of the maladaptive coping subscales. Depression

is similarly correlated, positively and significantly, but with only four out of six maladaptive coping subscales. Anxiety and depression are both positively and significantly correlated with humor, which is considered an adaptive strategy. Anxiety is also correlated with the adaptive subscale, planning though depression is not. The positive correlation between the two emotional psychological variables and humor may be explained by a multifaceted form of humor with adaptive and maladaptive subtypes of humor. In fact, Matthews (2016) found in their study that "participants who demonstrated more problems with emotion regulation were significantly more likely to utilize maladaptive humor styles in everyday life" (p. 50). Since anxiety and depression are, for the majority, correlated with maladaptive coping strategies, humor may be being utilized as a maladaptive strategy more so than an adaptive one.

Resilience

We found that perseverance is negatively correlated with maladaptive coping total scale. This correlation shows that participants that indicated high levels of perseverance also have low use of maladaptive coping strategies. However, the results do not indicate that higher levels of perseverance were significantly correlated with the total adaptive scale. Therefore, siblings who experience high levels of perseverance are not using adaptive coping strategies. Instead, they are less likely to use maladaptive coping strategies. According to Silvia et al. (2013), "GRIT predicts success in part by promoting self-control, thus allowing people to persist in repetitive, tedious, or frustrating behaviors that are necessary for success" (p. 200). If participants have more self-control for accomplishing long-term goals, or perseverance, the use of maladaptive or harmful coping strategies would be negatively impacted as the individual would be able to use their self-control to avoid maladaptive or potentially harmful coping strategies.

The results of the survey show that self-efficacy is significantly and positively correlated with both total adaptive coping strategies and total maladaptive coping strategies. Therefore, while high levels of self-efficacy are correlated with maladaptive coping techniques, they are even more significantly correlated with adaptive coping techniques meaning both styles are being used by the participants that scored high on self-efficacy. Research shows that "those who believe they can deal effectively with potential stressors, face and handle stress better, adopting more efficacious coping styles" (D'Amico et al., 2013, p. 1) and self- efficacy is defined as "People's beliefs about their capabilities to produce effects" (Bandura, 1994, p. 1). If results indicate a high level of self-efficacy, they are more likely to use a coping style that works for them, be it adaptive or maladaptive. Due to the results of the survey, it shows that self-efficacy is correlated with both types of coping strategies because the research shows that those who have high self-efficacy believe in their ability to produce an effect, in this case cope with stress. Therefore, they "approach difficult tasks as challenges to be mastered rather than threats to be avoided" (Bandura, 1994, p. 1) following through, and cope with the stress of having a sibling with an eating disorder.

Resilience is significantly correlated with total adaptive coping strategies and total maladaptive coping strategies, however, the correlation between resilience and adaptive coping strategies is stronger than resilience and maladaptive. According to Frydenberg (2017), "mindset, GRIT, emotional intelligence, and hardiness also contribute to an understanding of resilience" (p. 13) since "Each of these complementary theories focuses on success and achievement" (p. 13) so when examining resilience, it is important to also consider perseverance. However, grit differs in that it is about perseverance through a situation, while resilience is about bounce back or "rebound" (Sinclair & Wallston, 2004, p. 94). Research has found that high levels of resilient

coping, as measured by the BRIEF scale, should protect an individual from negative psychological outcomes due to stress.

Across the maladaptive coping subscales, perseverance is negatively and significantly correlated to five out of six of the scales. Despite the similarities, self-efficacy and resilience are both positively and significantly correlated with self-distraction and substance use. Resilience is the only psychological variable in this section to be positively and significantly correlated with denial. Perseverance is not correlated across any of the adaptive coping subscales but self-efficacy and resilience are both positively and significantly correlated with all of the adaptive subscales except for religion. Resilience is not correlated with humor either but self-efficacy is correlated with humor. These results indicate that self-efficacy and resilience are more similar variables while perseverance is an entirely different concept.

Substance Use

This study found that substance use is significantly correlated with total adaptive coping strategies and total maladaptive coping strategies; however, the correlation between substance use and maladaptive coping strategies is stronger than the substance use and adaptive correlation. One maladaptive coping strategy from the COPE scale is substance use, explaining the stronger correlation between substance use and maladaptive coping. There is a "self-medication hypothesis perspective" (p. 539) which is a somewhat cyclical view where those who use maladaptive coping strategies are less able to deal with their stress making them more likely to use substances to reduce stress which is a maladaptive technique in itself. According to research by Metzger et al. (2017), "Students with better time management strategies, more effective study techniques, and greater resourcefulness often experience lower levels of stress" (p. 539) which is

often due to motivation. It is important to note that self-efficacy, GRIT, and resilience all contribute to motivation and therefore play a role in the use of adaptive or maladaptive coping techniques. Substance use should also be considered when examining conscientiousness, since according to Metzger et al. (2017), alcohol can “interrupt neural processes” (p. 539) that are essential to conscientious thought. The neural consequences of alcohol use in turn reduce coping abilities, increasing stress, and continuing the self-medication hypothesis.

The self-medication hypothesis can explain why substance abuse was significantly and positively correlated with all of the maladaptive coping subscales. However, substance use is also positively and significantly correlated with four adaptive coping subscales (active coping, planning, humor, and instrumental support). Substance use may make participants feel like they are taking part in coping by planning, joking, and seeking instrumental support, however, these coping strategies may not reduce the stress but instead be masked by the substance use so the individual believes they are effectively coping.

Personality Traits

Conscientiousness is significantly negatively correlated with total maladaptive coping strategies. Conscientiousness is defined as “an individual's tendency to be well organized, diligent, thorough, achievement-oriented, reliable, and self-determined" (Bartley & Roesch, 2011, p. 79), which Bartley and Roesch (2011) believe results in lower likelihood of facing stressful situations. Researchers have found that high levels of conscientiousness are related to better life satisfaction and serves as a “protective factor from stress” (Bartley et al., 2011, p. 81). This research explains the negative correlation between conscientiousness and maladaptive coping techniques and the lack of correlation between conscientiousness and adaptive coping.

Those who have high levels of conscientiousness are happier with their lives and protected from stress therefore, they have less need to use maladaptive or adaptive coping skills. However, those with low levels of conscientiousness have lower life satisfaction and less protection against stress. This explains the negative relationships between conscientiousness and maladaptive coping. Conscientiousness was also found to be negatively related to "depression, negative mood, and perceived stress" (Bartley & Roesch, 2011, p. 80) though our study did not run any analyses between depression and conscientiousness to identify a correlation among participant's responses.

Conscientiousness was found to be negatively and significantly correlated with all maladaptive coping subscales but self-distraction. This may have to do with the determination to complete tasks that those with high conscientiousness possess. Conscientiousness was also negatively correlated with humor but positively correlated with acceptance, implying that the humor being used is not actually an adaptive form.

The results also showed extraversion significantly correlated with total adaptive coping strategies for siblings of adolescents with an eating disorder. Research by Amirkhan (1995), found similar results, where extraversion was a predictor for "active and direct coping" (p. 191) like emotional support and this was true across multiple stressors. The results of this study in combination with the research by Amirkhan et al. (1995) has shown that extraversion does impact whether an individual uses adaptive or maladaptive coping strategies. The more extraverted someone is the more likely they are to use adaptive coping strategies, though this could be for a variety of reasons, which requires further research. However, extraversion is positively correlated with a maladaptive coping subscale, denial. It is also positively correlated with adaptive subscales, planning and emotional support. Research has found that extraversion

can significantly predispose individuals to seek support (Amirkhan et al., 1995) which can explain why extraversion is positively correlated with emotional support.

In contrast to extraversion's connection with total adaptive coping strategies, neuroticism is not correlated with either adaptive or maladaptive strategies. Contrary to Amirkhan et al.'s (1995) research which found that neuroticism predicted "passive and avoidant coping styles" (p. 191) like self-blame, this study did not find any correlation between the adaptive and maladaptive strategies total scales. However, this study did identify correlations between neuroticism and the subscale of self-distraction. When subscales of maladaptive strategies were evaluated, self-distraction emerged in correlation with neuroticism. Neuroticism may serve as a better indicator of avoidant coping techniques versus all maladaptive coping techniques.

Similar to neuroticism, two other personality traits identified in the Big Five Personality Inventory, agreeableness and openness, are not correlated with either total adaptive or total maladaptive coping techniques. High scores in openness as a personality trait means that a person would be "more curious, flexible, and creative" (Karimzade & Besharat, 2011, p. 801) than lower scores. Concurrent with our findings for the coping technique total scale, "openness has weak influence on coping responses" (Karimzade & Besharat, 2011, p. 801). The lack of significant correlations between openness and either adaptive or maladaptive coping strategies could be because the participants that scored strongly in openness "use multiple coping styles" (Karimzade & Besharat, 2011, p. 801) and accept their emotions more readily, needing to spend less time dealing with them. Similar to openness, agreeableness indicated a weak connection with coping techniques. High agreeableness is reflected in "easy and understandable" (Karimzade & Besharat, 2011, p. 801) persons. This tendency for getting along with others may

mean they have less conflict to be stressed over and therefore, no need to utilize either adaptive or maladaptive coping strategies.

Both agreeableness and openness are significantly and negatively correlated with subscales. Agreeableness is negatively correlated with two maladaptive coping subscales, venting and substance use, and the adaptive subscale humor. Openness is also negatively correlated with venting but positively correlated with planning. Highly open individuals have been found to use "problem-focused coping styles" (Karimzade & Besharat, 2011, p. 801) which includes planning.

Those that rate high in these two personality traits have been found to be less likely to use maladaptive coping strategies, which could explain the negative correlations. Specifically venting has been found to increase the impact of "negative emotions" (Brown et al., 2005, p.797) on individuals but for those with agreeableness and openness, they use positivity when faced with stress and are unlikely to use negative coping strategies (Karimzade & Besharat, 2011, p. 801).

Interview Discussion

The main purpose of conducting interviews for this research was to actually hear about these sibling's experiences to better explain their survey results. While the number of interview participants was limited, it did give us a peek into the highly stressful lives of siblings of adolescent's diagnosed with an eating disorder. Our interviewees echoed interviews conducted across research for siblings of individuals with a mental health disorder. Callio and Gustafsson (2016) encountered similar themes, such as worry, feeling "disregarded" (p. 617) by parents, and the importance of having the opportunity to be involved with treatment and to learn about eating

disorders. The importance of education was echoed by all of our interviewees, one saying "I think siblings should do a lot of research because there are a lot of wacky things in the eating disorder world." The main themes identified in the interviews highlighted the similarities between the participant's experiences as siblings of an adolescent with an eating disorder. This may be due to their similar demographics or represent a broader range of siblings; more research is needed to make that determination.

Limitations

Limitations for this study include access to internet, as the study and follow-up interviews were both conducted online. The survey itself may include some limitations, such as the inability to include more detailed experiences, which was the purpose of the follow-up interview.

Due to the sensitive nature of the topic, some qualified individuals may not have felt comfortable taking the survey which may impact the results as they may reflect a group that is more comfortable discussing emotions and reliving past experiences. This may mean that the participants that choose to do so because they may be more likely to use coping mechanisms to reduce stress, feeling more comfortable with the topic. Participants that agreed to a follow-up interview may have done so because they possess some quality that the participants that did not agree to the follow-up interview do not. This could be due to personality traits or untested psychological variables.

This study did not determine gender or ethnic differences in the sample, nor did we assess cultural impact. Individuals from different cultures may use different coping strategies or experience psychological variables differently. This means that siblings of adolescents with an

eating disorder may have different experiences and therefore, different results, based on their gender, culture, or ethnicity.

One major factor of this study was the use of Mechanical Turk which has incredible benefits but does pose some limitations. Research has found MTurk results to be reliable and consistent (Duffie, 2019) but it has also found respondents to most likely be "Caucasian, technologically-adept, highly educated secular" (McDuffie, 2019) which may explain the lack of correlations between any psychological variable and the coping subscale of religion. From our sample collected from MTurk, we had a more male bias sample which may be another limitation of Mechanical Turk. MTurk also limits access to those who have internet and know how to use it, which may alienate older adults or potentially low income individuals without internet. However, MTurk makes it "easier to collect data on participants who represent highly stigmatized, potentially concealable identities" (Smith et al., 2015, p. 222) because it is online providing the participant anonymity. In fact, it has been found that participants are more likely to report on "diversity in response to ... health-related issues" (Smith et al., 2015, p. 222) when online, the same research suggests that MTurk is a "reliable way to sample from hard-to-reach populations" (Smith et al., 2015, p. 226).

Reliability

While all of the scales utilized in this study were found to be reliable amongst other populations, there were a few that did not have strong enough reliability across our sample. The GRIT scale, the Big Five Personality Inventory, and the Brief Resilient Coping Scale all had reliability under .7. The COPE scale, while its total reliability is .850, all of the subscales are under .7. It is possible that these scales are not a good measure for this specific population. Since

the participants were answering the survey from the point of view of how they experienced their sibling's illness as it directly relates to them is a limitation to this study. Since both the GRIT scale and the Brief Resilient Coping Scale were both underperforming in reliability, this study is only going to accept the implications and correlations for self-efficacy in regards to the resilience group. While the results produced from the underperforming scales are interesting, unfortunately, they provide nothing more than a jumping off point for future research. However, due to the scales repeated reliability in a plethora of different studies it seems that these scales are underperforming for this sample. Our study would benefit from replicating and rerunning this study to ensure the lack of reliability falls with the measurements and not the sample. However, the reliability for self-efficacy, anxiety, depression, substance use, and coping strategies are all strong and report informative data. In addition, the study would also benefit from an analysis of sibling order to identify difference in sibling relationships and our variables.

Self-Selection

For the follow-up interview participants, the shared demographics, especially the earlier use of therapy, may have influenced the participant's willingness to partake in the follow-interview. However, since we did not ask that on the survey, we cannot confirm it for this sample.

Conclusion

Researchers have been identifying a gap in the literature on siblings of adolescents with an eating disorder since at least the 1990s (Vandereycken & Van Vreckem, 1992) and yet, thirty years later, the gap hasn't been filled. It is imperative that if we care about mental health, when examining an individual with an eating disorder, we must remember their siblings. If this

research has only done one thing, it has made it clear that these siblings are being effected in ways that they may or may not be aware of. It is a forgotten group that has shown up to fill out a survey and to answer interview questions, they have a burden and a message revealed through this study. The siblings of AEDs are willing to share their stories, if only we had paid attention sooner.

Future Directions

Possibly due to the relatively small amount of individuals with an eating disorder, maybe because mental illness is stigmatized, or because they just get forgotten, there is an incredibly small amount of research done to better understand siblings of adolescents with an eating disorder. Our study has found some well-known scales to be unreliable for this sample, indicating that new scales need to be developed to be able to more reliably test this population. More research is needed on the interactions we found between these variables to better understand the coping mechanisms used and avoided by siblings of adolescents with an eating disorder. Nothing will get better for these siblings until we care to understand them beyond more than their sibling's illness, until we start remembering to stop forgetting them.

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Table A

Relationship between Psychological Variables and Adaptive and Maladaptive Coping Strategies

	Coping Strategies	
Psychological Variables	Adaptive	Maladaptive
GRIT	.017 (.871)	-.378** (<.001)
Self-Efficacy	.469** (<.001)	.206* (.045)
Anxiety	.245* (.017)	.671** (<.001)
Depression	.250* (.014)	.300** (.003)
Resilience	.537** (<.001)	.342** (<.001)
Substance Use	.420** (<.001)	.824** (<.001)
Extraversion	.240* (.019)	.124 (.229)
Agreeableness	.013 (.901)	-.194 (.059)
Conscientiousness	-.101 (.330)	-.396** (<.001)
Neuroticism	.011 (.913)	.077 (.458)
Openness	-.027 (.798)	-.106 (.306)

*$p < .05$. **$p < .01$.

Table B

Relationship between Psychological Variables and Maladaptive Coping Subscales

	Maladaptive Coping Strategies					
Psychological Variables	Self-distraction	Denial	Venting	Substance use	Behavioral Disengagement	Self-blame
GRIT	-.081 (.434)	-.301** (.003)	-.304** (.003)	-.242* (.018)	-.291** (.004)	-.315** (.002)
Self-Efficacy	.260* (.011)	.172 (.096)	.023 (.822)	.264** (.010)	.080 (.441)	.035 (.740)
Anxiety	.208* (.043)	.453** (<.001)	.433** (<.001)	.498** (<.001)	.532** (<.001)	.594** (<.001)
Depression	-.119 (.250)	.266** (.009)	.164 (.112)	.361** (<.001)	.272** (.008)	.211* (.040)
Resilience	.395** (<.001)	.289** (.005)	.177 (.086)	.260* .011	.162 (.118)	.134 (.195)
Substance Use	.404** (<.001)	.559** (<.001)	.517** (<.001)	.596** (<.001)	.634** (<.001)	.652** (<.001)
Extraversion	-.141 (.173)	.236* (.022)	.085 (.412)	.112 (.279)	.149 (.149)	.023 (.825)
Agreeableness	.032 (.757)	-.068 (.516)	-.253* (.013)	-.364** (<.001)	-.018 (.859)	-.084 (.419)
Conscientiousness	-.099 (.341)	-.229* (.026)	-.296** (.004)	-.326** (.001)	-.308** (.002)	-.346** (<.001)
Neuroticism	.351** (<.001)	-.087 (.399)	-.040 (.704)	-.102 (.326)	.110 (.287)	.157 (.128)
Openness	-.027 (.796)	-.026 (.802)	-.205* (.047)	-.010 (.926)	-.005 (.963)	-.180 (.082)

*$p < .05$. **$p < .01$.

Table C

Relationship between Psychological Variables and Adaptive Coping Subscales *$p < .05$. **$p < .01$

Psychological Variables	Adaptive Coping Strategies							
	Active Coping	Planning	Positive Reframing	Acceptance	Humor	Religion	Emotional Support	Instrumental Support
GRIT	.164 (.111)	.001 (.989)	.040 (.704)	.143 (.167)	-.182 (.078)	-.143 (.165)	.058 (.580)	.091 (.379)
Self-Efficacy	.398** (<.001)	.348** (<.001)	.310** (.002)	.220* (.032)	.146 (.157)	.158 (.126)	.280** (.006)	.263** (.010)
Anxiety	.104 (.316)	.316** (.002)	.082 (.432)	-.049 (.638)	.362** (<.001)	-.025 (.809)	.108 (.300)	.164 (.112)
Depression	-.004 (.967)	.140 (.175)	.198 (.055)	.192 (.062)	.202* (.050)	.079 (.444)	.148 (.153)	.117 (.260)
Resilience	.372** (<.001)	.331** (.001)	.494** (<.001)	.248* (.015)	.278** (.006)	.062 (.548)	.358** (<.001)	.270** (.008)
Substance Use	.208* (.043)	.382** (<.001)	.177 (.087)	.047 (.651)	.569** (<.001)	.016 (.880)	.138 (.182)	.288** (.005)
Extraversion	.128 (.215)	.225* (.029)	.169 (.102)	-.048 (.643)	.044 (.675)	.158 (.125)	.244* (.017)	.142 (.169)
Agreeableness	.020 (.849)	-.043 (.678)	-.052 (.615)	.162 (.116)	-.205* (.046)	.154 (.136)	.012 (.905)	.029 (.780)
Conscientiousness	-.023 (.828)	.045 (.667)	.119 (.250)	.206* (.045)	-.356** (<.001)	-.086 (.407)	-.093 (.372)	-.211* (.040)
Neuroticism	-.046 (.656)	-.060 (.564)	-.126 (.222)	.089 (.390)	.090 (.388)	.003 (.974)	.074 (.474)	.020 (.844)
Openness	.184 (.074)	.245* (.017)	.005 (.959)	-.114 (.273)	-.146 (.159)	-.003 (.974)	-.194 (.060)	-.057 (.586)

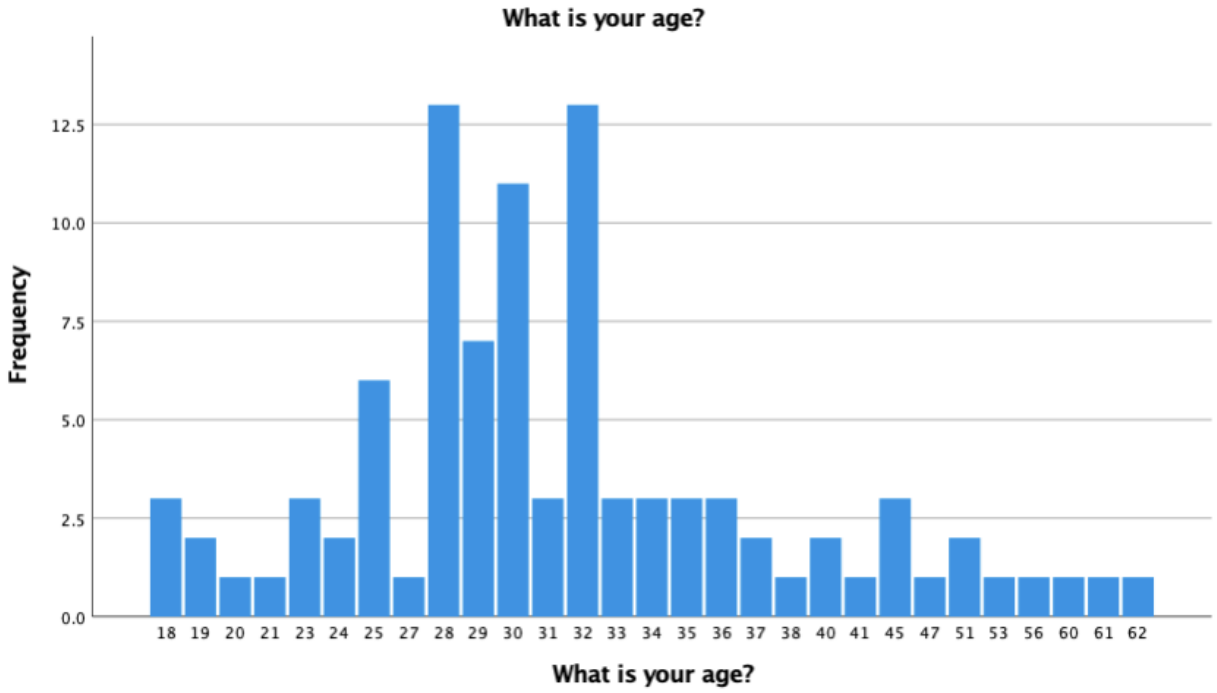
Appendix A

Follow-up Interview Questions

1. What eating disorder was your sibling diagnosed with?
2. How old were they at the time of the diagnosis?
    a. How old were you?
    b. How old are you now?
3. From your perspective, what was your family's reaction to diagnosis?
4. How did you feel you fit in/what was your role in the family?
    a. Did that role change?
5. Did you feel you had support during this time?
    a. As a sibling, have you felt there was any support specifically for you?
6. How did you feel about your sibling's diagnosis?
7. What kind of treatment did your sibling receive?
8. Did your sibling attend treatment for their eating disorder?
    a. Did you attend treatment during this time with your sibling?
9. Have you ever received treatment/therapy for yourself?
10. How did you cope with your sibling's diagnosis?
    a. How did you take care of yourself?
    b. How did you take your mind off your sibling's illness?
11. How was your relationship with your sibling?
    a. Did you try and help him or her?
        i. How?
    b. Did you pull away or withdraw from your sibling?
        i. If so, in what ways?
12. How do you cope now?
    a. Have your coping strategies changed over time?
13. How do you think your experience of having a sibling diagnosed with an eating disorder has impacted you?
14. Is there anything else you feel I should know, or anything else you would like to share about this topic?

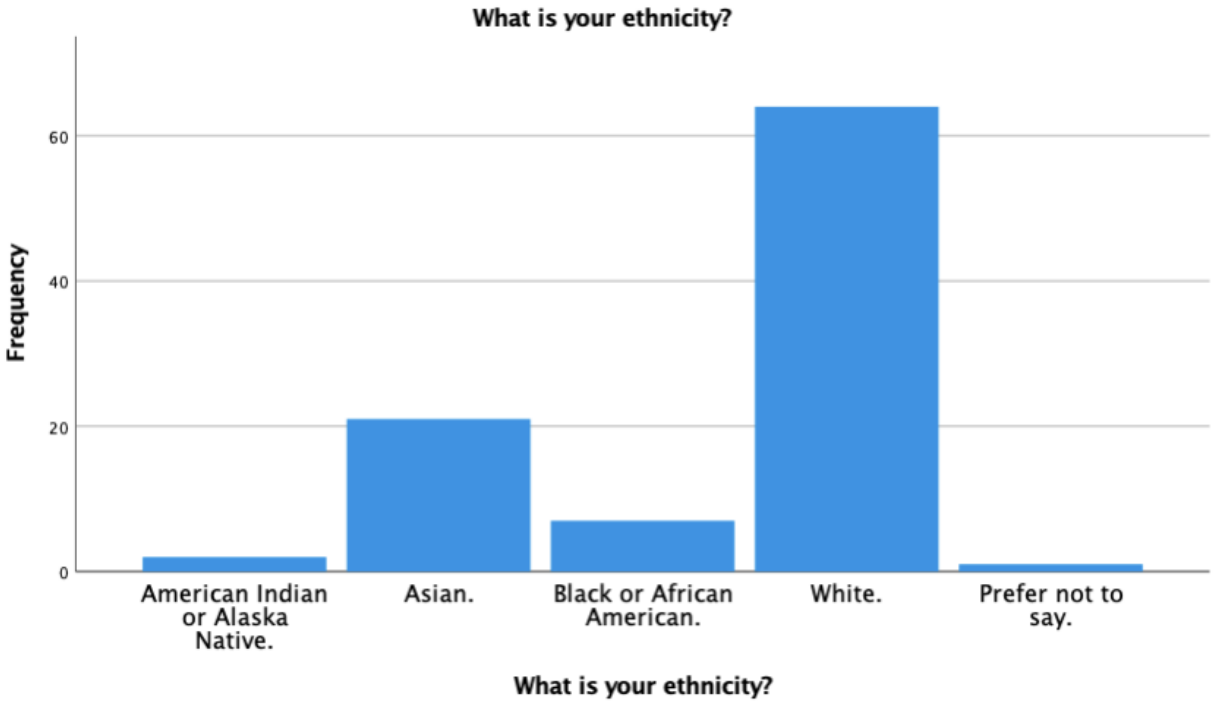
Appendix B

Age Frequency Chart



Appendix C

Ethnicity Frequency Chart



Appendix D

Interview Themes X Quotes from Interviews

Theme	Definition	Quote (Interviewee1)	Quote (Interviewee 2)	Quote (Interviewee 3)
Familial Role	"Family roles are the recurrent patterns of behavior by which individuals fulfill family functions and needs" (Peterson & Green, 2009, p. 1)	"I feel like I'm keeping us together, I must watch over us, make sure everyone is getting along, and make sure everyone is playing their role in the family. Oldest daughter keeping everyone together...it was always between the sibling and the parent, and you were just stuck in the middle. So, I would try to, first, be the peacemaker, maintain order"	"My role has really been like coming and going. I do not live with my sister all the time, so like when I am there, I serve as an extra set of eyes for my parents really. With my parents, if there is anything my sister discloses to me that is vital for her health or her wellbeing or her safety, I make sure to disclose that to my parents, so any mention of self-harming, any mention of purging or if she had a seizure and we did not find out about it. Stuff like that, I always tell them"	"At first, I did not exactly know what was going on at all. Over time it affects you more. Sometimes I end up being a little bit more of a peacemaker, but it is not always that way because obviously I have my own opinions at times. That can cause conflict, but I usually end up being more in the middle trying to calm things down a little bit"
Support	"Assist, Help" (Merriam-Webster, n.d., Support)	"Not exactly, at least not from my family in that way because we were all very focused on her and making sure that she got the resources she needed and I was a part of that too, we all kind of suppressed our own feelings and what we needed to get her that help"	"I've interpreted that as support in putting some sort of barrier in place where I'm not taking on too much of the care or of the illness, so I've really appreciated that even when I feel like that is great solution and I want to be helpful but having some barriers in place that I didn't place there, other people have been placing for me, I've really interpreted that as support for me to take care of myself outside of what's happening in our family or to my sister"	"I find a lot of support from my family, especially my mom. I try to be very protective of my little brother so he doesn't have to be in the cross fires like I was as a kid"
Coping	"To deal with and attempt to overcome problems and	"I would say, I didn't really. It was a lot of pushing all the feelings down, suppressing, and	"The more educated I've become about eating disorders, like all of my family we've read	"I find a lot of support from my family, especially my mom. I try to be very

	difficulties" (Merriam-Webster, n.d., Cope).	just ignoring it and then you know obviously it is upsetting and you get angry but there is nothing you can do about it, so you try to move on and not really deal with it which is what I did"	multiple books about eating disorders, that has really helped me I don't know if necessarily, cope but the more I know about it the more its validated...The second thing, I guess partner and friends that I have confided in over the years has helped as well... This is the third point on how I have coped on my own, sometimes I just cannot be there or cannot be at home.... but being able to leave and go somewhere else just to cope and recharge and then come back"	protective of my little brother, so he does not have to be in the cross fires like I was as a kid. I cope by painting a lot, I paint a lot, I do a lot of art and crafts and stuff like that. I read and stuff like that, that's my coping"
Personal Impact	"To have a direct effect" (Merriam-Webster, n.d., Impact)	"No matter what happens and how the future looks, you're always just going to worry which I think is a large part of it"	"The first one is just my awareness of mental illness, people's views of food, wellness, body image. For an example, the graduate program I am a part of, a lot of people have done image into body image, the fat movement, stuff like that those are moments where I cannot keep quiet in some of our courses where I feel like I need to share my sister's experience, or I need to share that even discussions around being fat positive can be harmful to people going through something like that. Even a body positivity movement can be very triggering to individuals. That is one thing that I have voiced when I have been in conversations that I	"It makes me a lot more sensitive, don't brush off when someone is asking for help, they do need help and they do need to figure out a way to be happy again because it is a serious issue. If a cry for help is out there, you need to answer it because it could be too late later"

			would not have mentioned 5 years ago, pre diagnosis or even before I learned more about eating disorders"	
Involvement	Extent of inclusion in sibling's disorder	"Every time I was home, I would get involved if there was an argument or something, I would insert myself into the situation which was just really bad for me mentally, so I do think being away was good even though I did feel bad that I couldn't be as involved as I wanted to be"	"The second way I was involved that was heavy involvement, she went to eating recovery center in Denver, CO or Aurora or wherever it is. They do multi week family sessions at the end when they are in the day program ready to transition home. So, my parents took turns, week by week, going to those sessions and they had me come out and do a week of the family programming which when I was there, there was not a lot of siblings there was mostly just parents and a couple of grandparents like if they were primary or partial care takers. Because I was going to be, at that time, living at home with my family, they thought it was important for me to be a part of the team"	"I would say for the year, two years before she went to [Treatment] I felt like I was kind of involved and kind of like, kind of agreed with her a little bit in a way, in a way I would say I also had been really, I wouldn't say manipulated but I would say I wanted to be like her because she is my older sister. I would copy her in eating patterns and exercising, so in a way, I would say I copied her, but I was different from her because I was able, once I realized what was going, I was able to eat normally and exercise normally. I did not have to go to treatment or anything like that but after a while I just realized that dying so I did not want to talk to her anymore. She was just so delusional, I just could not stand it anymore because I could not support that, I could not watch someone die and support it. Especially someone you love so much"
Forgotten Sibling	The extent to which participant felt their feelings	"There were definitely times where I felt sidelined, but I also	"The thing that stood out to me the most was, one of our meetings with the	"Siblings need to know that it is okay to go to therapy because there

	were secondary to their sibling's	think part of me realized that it was necessary at times because obviously she did need more help and more attention than I did. I did feel definitely less attended to but I also kind of thought it was correct and necessary"	therapist that was working with my sister. Like I had pointed out that I thought my sister was lying or faking like her own goals or her own improvements mentally, just because I can read her, and I know her as a sibling, and I got backlash from that therapist. Like she was mad at me for saying all of that and just said that it was jealousy as a sibling. Just characterized my view as my sister very poorly in a meeting with my parents. Which also caused my parents to not be happy with me for disclosing things that we later found out to be true. She relapsed super quickly; I had noticed behaviors in her. Later I was validated by my parents, like "oh wow you can really read your sister" but I was treated very poorly in those early meetings, and I was trying to be honest, and I wanted to help her. So that kind of put a bad taste in my mouth for the family therapy sessions because I went in really excited and wanting to be a part of the team and wanting to help but my views were shut down immediately"	is a lot of stigma about going to therapy and just because your sibling has a mental illness and they should be going to therapy, whether they are going to therapy, you do need to go to therapy because the things going on in your family are not right and if you are feeling alone, obviously, you need to talk to someone. Communicating to your parents that you're feeling certain ways is important too because my mom was so focused on my sister that she didn't even realize that I had depression and obviously, that stung a little bit because I was like "wow, you didn't see that?" but it can be really hard to have a child that's dying, so you don't really see your other children being affected"
Love	"a strong affection for another arising out of kinship or personal ties" (Merriam-	"All you can do is really support them, encourage them, and try to help them through what they're going through but you can't control it, but you have to realize	"We've emphasized we don't want my sister to be a part of the statistic. We have a friend who lost their daughter a couple of years ago and they have a foundation	"It really has been worth it to have the memories with my sister that I have now because if she passed away at that time, I wouldn't have had as

	Webster, n.d., Love)	that and realize that it is not your fault or anyone's fault, not even the person or the sibling dealing with the issues. But definitely the support and the encouragement and the just being there for them because you're struggling but so are they"	for her now. We've always said where my sister is at a low point, where she isn't complying to treatment, we don't want to start a foundation for her, we'd rather have her in front of us"	good of a memory of her, I would have remembered her as someone that was very angry, I am so grateful that I get to see someone that is so much more than that"
Responsibility for sibling	"Liable to be called on to answer" (Merriam-Webster, n.d., Responsible) to take care of sibling	"Everyone would say that I would act like my sibling's second parent because I was trying to urge her and encourage her to do all these things and I was acting more like a parent than a sibling, I felt like"	"I'm not necessarily like a third parent, but I am part of the team making sure she is doing what she needs to do. If I notice something, I'm reporting on it so because of that I feel like we don't have the type of relationship that I would necessarily want to have"	"I think what I learned is to be a better advocate for myself and saying that I do need help or like calling it as I see it, like this is what's going on and it needs to stop, just being able to stand up for myself more but I wouldn't say exactly responsibility"