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PREDICTING DYSFUNCTIONAL ANGER THROUGH IRRATIONAL BELIEFS AND MALADAPTIVE SCHEMAS: A MIXED METHODS ANALYSIS

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ABSTRACT

PREDICTING DYSFUNCTIONAL ANGER THROUGH IRRATIONAL BELIEFS AND MALADAPTIVE SCHEMAS: A MIXED-METHODS ANALYSIS

Katharine Downing Romero

This study explored the complex relationship between irrational beliefs, maladaptive schemas, and anger using validated quantitative methods and a novel Articulated Thoughts in Simulated Situations (ATSS) paradigm. An investigation involving 170 participants from student and general populations used text-based scenarios to induce anger, revealing significant associations between expressed irrational beliefs, early maladaptive schemas, trait anger, and general anger dysfunction.

While irrational beliefs were not significantly linked to induced anger levels in this non-clinical population, state anger increased the strength of the relationship between anger outcomes and early maladaptive schemas, suggesting that heightened emotional states may amplify schema impact on anger processing and reactions. However, key schemas most predictive of dysfunctional anger remained stable regardless of induced anger. Importantly, early maladaptive schemas significantly mediated the relationship between irrational beliefs and both trait anger and overall anger dysfunction. This finding indicates that the influence of situational irrational beliefs on anger outcomes is partly explained by more pervasive cognitive-emotional patterns represented by early maladaptive schemas.

These findings have important implications for cognitive-behavioral interventions, highlighting the need to address both irrational beliefs and maladaptive schemas in therapeutic settings. Potential directions for future research and additional practical applications in clinical practice are discussed.

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INTRODUCTION

Statement of the Problem

Although our understanding of the cognitive components of anger has expanded in recent years, our knowledge remains limited. This is partly due to the insistence on conflating the emotional experience of anger with behavioral aggression, leading to a vast majority of anger research examining samples of men who have perpetrated physical violence. Although aggression as an aspect of anger expression is inarguably problematic, our understanding of individuals high on "anger-in" or those whose anger leads to less visible or dramatic forms of expression, such as relational, passive, and indirect aggression, has been limited. In addition, recent research supports the notion that anger is strongly influenced by the situational context, meaning some individuals experience high levels of problematic anger only in specific scenarios (Eckhardt and Deffenbacher, 1995). Although situation-specific anger can also impair overall functioning, our current quantitative methods of measuring anger often do not distinguish between general and context-specific anger, resulting in us losing valuable information about subjects who may rate themselves as disproportionately angry only when triggered by certain provocations. Consequently, therapeutic interventions based on existing research are not adequately designed for individuals experiencing clinical impairment due to more subtle expressions of anger or those prone to situation-specific problematic anger.

The cognitive correlates of problematic anger have a strong basis in both theory and clinical research. However, most research relies on self-report questionnaires administered when individuals are not necessarily experiencing anger, which limits the reliability and validity of the findings. This study aimed to more accurately capture the

cognitive experience of anger by employing two key strategies: (1) distinguishing between immediate, event-specific cognitive distortions and more chronic, deeply rooted early maladaptive schemas, and (2) administering both qualitative and quantitative research methods during induced anger states. This approach allows for a comprehensive examination of both surface-level reactions and deeply ingrained cognitive patterns associated with anger.

Rationale

Anger, like all affective experiences, is a complex and nuanced emotion that can become maladaptive if experienced frequently, intensely, acutely, or for long durations. Contrary to common perception, anger triggers aggressive expression in only a small percentage of individuals (Averill, 1983). Given the extreme consequences of these behaviors, researchers often focus on these overt physical and verbal aggressive expressions as the target of clinical intervention rather than the underlying anger that might accompany them. However, many studies have identified equally serious costs associated with suppressing anger, including physiological (e.g., cardiovascular disease (Jorgensen and Kolodziej, 2007), psychological (e.g., social anxiety (Trew and Alden, 2009); eating disorders (Zaitsoff et al., 2002), and social (e.g., interpersonal issues (Han et al., 2015) problems. Moreover, suppressing anger ("anger-in") and expressing it aggressively are not mutually exclusive constructs. In fact, an increase in suppressed anger can heighten the probability of eventual physical or verbal aggression (DiGiuseppe & Tafrate, 2015).

Cognitive-behavioral interventions are the most widely supported treatments for reducing dysfunctional anger (Lee & DiGiuseppe, 2018), as they focus on altering the

cognitive correlates of the emotion. These interventions are based on the cognitive-behavioral model, which posits that the thoughts contributing to and sustaining negative emotions are the most controllable and changeable aspects of those emotions. Therefore, understanding the cognitive landscape associated with anger is crucial for identifying and accurately measuring these cognitions.

Anger and Cognition

Cognitive theories of emotion provide crucial insights into the processes of anger experience and expression. Appraisal theories, which form the cornerstone of this understanding, suggest that the evaluation of a stimulus serves as the critical link between perception and subsequent emotional response (Beck, 1976; Ellis, 1977; Lazarus, 1991). In the context of anger, these theories consistently associate the emotion with the perception of a threat, coupled with the attribution of responsibility or blame to external entities (Berkowitz & Harmon-Jones, 2004; Roseman, 1991; Scherer, 2001; Smith & Lazarus, 1993).

The role of self-efficacy in anger has been subject to evolving interpretations. While high self-efficacy was long believed to differentiate anger from other emotions, contemporary research suggests that it more likely influences the mode of anger expression. Specifically, lower levels of self-efficacy appear to correlate with internalized expressions of anger ("anger-in"), as opposed to outward manifestations of aggression (Bandura, 1997; Deffenbacher, 1999).

Among the various cognitive models, the SPAARS (Schematic, Propositional, Associative, Analogue, Representation Systems) model stands out as the most comprehensive framework for understanding emotions (Power & Dalgleish, 2008;

DiGiuseppe & Tafrate, 2015). This model proposes a multi-level system in which stimuli are processed through parallel schematic, associative, and propositional pathways. This processing involves both rapid, automatic associations and a more deliberate, effortful appraisal route, offering a nuanced explanation for the complexity of emotional experiences. Specifically in relation to anger, the SPAARS model suggests that the emotion arises following goal interruption by an identifiable agent, coupled with an appraisal that the provoking event was "deliberate, avoidable, or arose through negligence" (Power & Dalgleish, 2015). The SPAARS model's propositional system is responsible for the conscious recognition of automatic thoughts, while the schematic system processes higher-order appraisals of goal interruption, agency, and deliberateness (Power & Dalgleish, 2015). These two systems—propositional and schematic—are most often targeted in cognitive therapy for anger management (DiGiuseppe & Tafrate, 2007). This approach allows therapists to address both the immediate, conscious thoughts associated with anger and the deeper, more ingrained patterns of interpretation that contribute to anger responses.

In disordered anger, a tendency for cognitive errors can increase the likelihood of such appraisals and contribute to either inappropriate or disproportionate anger to the current situation. In investigating the cognitive errors that mediate dysfunctional anger, theories have highlighted the role of biased information processing, irrational beliefs, cognitive distortions, and false attributions (Ellis, 1977; Beck, 1999; Deffenbacher, 1992; 1999; Dodge, 1991; Dryden et al., 1990). The cognitive processes that have received the most research support include (1) attributions for hostile intent (HA: Dodge et al., 2015), (2) overgeneralization (OG: Beck, 1999), (3) inflammatory labeling, a variation of other

condemnation (IL: Deffenbacher, 1999; Ellis, 1994) – which involves degrading, condemnation of others, (4) demandingness (DEM: Ellis, 1994), (5) catastrophic evaluation (AWF: Ellis, 1994), and (6) frustration intolerance or discomfort intolerance (FI) (Martin & Dahlen, 2007; Soto & DiGiuseppe, 2016; Vîsla et al. 2016).

In addition to those above, the "Code of Honor" cognitions represent beliefs that have recently gained attention for being strongly correlated with anger and aggression (McGill et al., 2021). "Code of Honor" beliefs are thoughts or attitudes concerning social acceptance or power and are related to the importance of being viewed as strong and capable of protecting oneself. For example, "I must behave aggressively to protect my reputation; I will not let someone weaker than me or below me show me up" (McGill et al., 2021).

Martin and Dahlen (2007) developed the Angry Cognitions Scale (ACS) to quantify and assess the cognitive processes associated with anger. This instrument was designed to measure five cognitive processes common across major CBT theories of anger: misattributions of hostile intent, overgeneralization, inflammatory labeling, demandingness, and catastrophic evaluation. The ACS presents participants with nine anger-provoking scenarios, asking them to indicate the degree to which each situation would trigger these five cognitive processes. Additionally, the scale includes a sixth subscale representing adaptive processes for anger control.

The structure of the ACS consists of nine anger-triggering situations, each with seven Likert response options corresponding to the six cognition subscales. Initial studies demonstrated the ACS's adequate test-retest reliability and its ability to predict hostile thoughts and state anger following provocation (Martin & Dahlen, 2011). However,

subsequent research revealed limitations in the scale's factor structure. Addressing these concerns, Soto and DiGiuseppe (2016) revised the ACS to include separate cognitive scales for frustration intolerance, awfulizing, and consideration of anger's negative consequences. This revision aimed to provide a more comprehensive and nuanced assessment of anger-related cognitions. A recent study by DiGiuseppe et al. (2022) employed linear regression to examine the unique contributions of different cognitive processes to self-reported anger-in or anger-out expression. Their findings revealed that only three factors—hostile attributions, inflammatory labeling, and recognition of anger's negative consequences—uniquely contributed to anger scores across both types of anger expression.

The relationship between self-esteem and anger remains a topic of debate. While substantial research has challenged the hypothesis that low self-esteem is associated with anger and aggression (Baumeister et al., 1996; Bushman & Baumeister, 1998), psychodynamic theorists maintain that negative self-evaluations can indeed precipitate dysfunctional anger (Kohut, 1972; Ornstein, 1999). It is worth noting, however, that the studies refuting this hypothesis primarily involved college student samples rather than clinical populations or individuals with high anger levels, potentially limiting their generalizability.

Types of Dysfunctional Anger

In clinical research, there has been a tendency to merge the concepts of anger as an emotional experience and aggression as its outward behavioral expression despite their distinct characteristics. Anger is most comprehensively defined as an emotional state comprising cognitive, phenomenological, and behavioral components that typically arise

when an individual feels threatened, challenged, or experiences goal obstruction (Kassinove & Sukhodolsky, 1995; Spielberger, 1999). Conversely, aggression is a specific behavioral action carried out with the intent to harm or injure another person, accompanied by the expectation that such harm will occur (DiGiuseppe & Tafrate, 2007).

While aggressive behavior can be associated with anger, it is important to recognize that it represents only one potential component of the anger experience. The manifestation of aggression can vary significantly among individuals experiencing anger. For most, aggressive behavior does not play a prominent role in their anger expression. Conversely, others may engage in aggression purely as an instrumental action, devoid of affective anger, to achieve a specific objective.

This distinction highlights the complexity of the relationship between anger and aggression, emphasizing the need for a more nuanced understanding in clinical research and practice. Recognizing that anger can exist without overt aggression and that aggression can occur without the emotional experience of anger is crucial for developing more targeted and effective interventions for individuals struggling with anger-related issues. Furthermore, it's important to note that aggression itself can manifest in various forms. Researchers have identified several types of aggression, including physical, verbal, relational, and passive-aggressive behaviors. Each of these forms can be further categorized as either reactive (in response to perceived threats or provocations) or proactive (goal-oriented and premeditated) aggression (Dodge & Coie, 1987; Vitaro & Brendgen, 2005). Individuals experiencing anger can be differentiated based on the varying intensities of behavioral, cognitive, and affective components they exhibit. For instance, some individuals may experience intense cognitive and affective aspects of

anger (such as hostile thoughts and feelings of frustration) but demonstrate minimal behavioral aggression. Others might display significant behavioral aggression with relatively less intense cognitive or affective experiences. Others may exhibit high levels across all three components.

Some of the first work in categorizing people into anger subtypes began with Hecker and Lunde's work with chronically angry cardiac patients (1985), resulting in a six-category model to differentiate dysfunctional anger. Their model differentiated anger subtypes into uncontrolled, overcontrolled, and suppressed types, each further classified as either impulsive or deliberate. Concurrently, Spielberger made significant contributions to the field by identifying three crucial domains of anger expression: anger-in, anger-out, and anger-control. Importantly, Spielberger was the first to distinguish between anger as a chronic, stable predisposition (trait anger) and anger as a momentary emotional state (state anger). To measure these varied experiences of anger, Spielberger developed the State-Trait Anger Expression Inventory (STAXI; 1999), which has since become one of the most widely used instruments in anger assessment.

The STAXI provides valuable insights into individual anger profiles. High scores on "anger-out" indicate frequent outward expressions of anger, while high "anger-in" scores suggest a tendency to suppress or direct anger inward. Individuals scoring high on "anger-control" demonstrate an ability to restrain or regulate their anger expression. The utility and validity of the STAXI have been demonstrated across diverse populations. Studies employing this inventory have confirmed the heterogeneous nature of anger expression in various groups, including intimate partner violence perpetrators (Eckhardt et al., 2008), individuals diagnosed with social anxiety disorder (Erwin et al., 2003), and

clinically normal populations (Han et al., 2015). The STAXI's factor structure has been empirically validated with a range of clinical and non-clinical populations (Deffenbacher et al., 1996; Foley et al., 2002; Dear, Watt, & Dockerill, 2003), solidifying its position as one of the primary measures of anger in contemporary research and clinical practice.

Eckhardt and Deffenbacher (1995) introduced an additional dimension for evaluating individuals with dysfunctional anger based on their clinical experience with angry clients. They observed that some individuals exhibit problematic anger across a wide range of situations, while others react intensely to specific triggers. For example, a person experiencing "road rage" may display extreme physiological arousal and verbally aggressive behavior while driving yet maintain average levels of trait anger and refrain from aggression in other contexts. This distinction is analogous to differentiating between generalized anxiety disorder and specific phobias in diagnostic terms. To capture these variations, they proposed four distinct disorders: situational anger disorder with aggression, situational anger disorder without aggression, generalized anger disorder with aggression, and generalized anger disorder without aggression.

Building on previous research, DiGiuseppe and Tafrate (2007) utilized the Anger Disorders Scale (ADS) to propose a more nuanced categorization of dysfunctional anger. The ADS is a comprehensive tool that differentiates between various aspects of anger, including different motivations for anger, types of aggression, provocations, and cognitive correlates of anger. Using this multifaceted approach, they identified three main subtypes of dysfunctional anger: (1) High Expression/Aggression without High Anger, (2) Low-Moderate Expression/Aggression with High Anger, and (3) High Expression/Aggression Behavior with High Anger. Within these main categories, they

observed variations in impulsivity, types of aggression, and the duration for which anger was perceived as problematic. This detailed analysis led to the development of the Anger-Regulation-Expression Disorder (ARED) framework, designed to capture individuals experiencing problematic anger manifesting as angry affect, aggressive behaviors, or both. The ARED model includes three subtypes: anger-in (subjective), anger-out (expressive), and a combined type. To meet the diagnostic criteria, individuals must experience problematic angry affect or aggressive behaviors for at least six months, with the framework allowing for variations in anger intensity, episode length, and overall duration. This comprehensive approach to categorizing anger disorders provides clinicians with a more refined tool for diagnosis and treatment planning, taking into account the diverse manifestations and underlying factors of dysfunctional anger.

In the most recent attempt to validate these subtypes using latent profile analysis, Romero & DiGiuseppe (2022) found eight distinct subtypes of anger, which they conceptualized as fitting into four larger clinical categories of dysfunctional anger: (1) Persistent Mild Anger Pathology, (2) ARED, Expressive Type, (3) ARED, Combined Type, and (4) Situational Anger (Romero, 2021). These findings indicate that individuals experiencing primarily Anger-In symptoms in the absence of aggressive behaviors might be better captured as having Persistent Mild Anger Pathology instead of a subtype of ARED as initially proposed by DiGiuseppe and Tafrate (2007). These individuals are much less angry than those in the ARED groups, but regardless, they view their anger as consistently problematic, with significant rumination and resentment.

Of course, it is necessary to acknowledge that any proposed typology or subtype classification of anger is inherently limited by and dependent on the specific facets of

anger being measured. A recent study by Cassiello-Robbins et al. (2022) provided valuable insights by examining anger-in, anger-out, rumination, and differentiating between verbal and physical aggression when identifying anger subtypes among individuals seeking treatment for dysfunctional anger. Their findings suggested that individuals were best categorized into low, moderate, and high anger groups, with a distinct anger-in profile characterized by high levels of expressive suppression. However, this study did not encompass the full range of variables assessed by more comprehensive measures such as the Anger Disorders Scale (ADS).

In the context of intermittent explosive disorder (IED), researchers were able to link different behavioral subtypes based on the nature and consequences of aggressive acts to varying degrees of functional impairment and comorbidity with other mental health issues (Fanning et al., 2019). However, their focus was primarily on behavioral manifestations rather than anger's affective or cognitive aspects. These studies highlight the importance of considering multiple dimensions of anger when developing and interpreting typologies. These studies collectively underscore the multifaceted nature of anger and the importance of considering its various dimensions when developing and interpreting typologies. Moreover, they highlight the complexity of anger as a psychological construct and its far-reaching implications for both accurate diagnosis and effective treatment planning.

Maladaptive Schemas and Anger

The SPAARS and other cognitive appraisal models emphasize that cognitive processing occurs both with and without conscious awareness. The aforementioned cognitive correlates related to anger are the thoughts that individuals recognize as part of

their anger experience and, therefore, the ones we hypothesize subjects will be able to articulate when asked to imagine themselves in an anger-inducing scenario. However, what is much harder to measure is what contributes to the automatic affective experience of anger that cannot be easily verbalized.

The cognitive frameworks we use to efficiently comprehend and organize the massive amounts of information we are exposed to daily were defined by Jean Piaget in 1923 as "schemas" (Piaget & Cook, 1952). Rational emotive behavior therapy and other cognitive-behavioral approaches operate under the notion that while schemas are a normal aspect of cognitive functioning, irrational beliefs or maladaptive schemas can introduce bias into information processing, leading to various forms of psychopathology and psychological distress (Beck, 1964; Ellis, 1994).

Young (1994), one of Beck's students, expanded on Beck's cognitive theory by incorporating psychodynamic and constructivist principles, particularly object relations theory. He defined early maladaptive schemas as "a broad, pervasive theme or pattern comprised of memories, emotions, cognitions, and bodily sensations regarding oneself and one's relationships with others developed during childhood or adolescence elaborated throughout one's lifetime and dysfunctional to a significant degree" (Young, 1994, p. 7). This expanded definition highlights the complex interplay between early experiences, cognitive structures, and emotional responses, providing a more comprehensive framework for understanding the development and maintenance of anger-related cognitions.

The most recent version of the Young Schema Questionnaire (YSQ-3) includes 18 total early maladaptive schemas (EMSs) within five related but slightly different

domains identified as (1) disconnection and rejection (EMSs of emotional deprivation, abandonment/instability, mistrust/abuse, defectiveness/shame, and social isolation, (2) impaired autonomy and performance (EMSs of failure, dependence, vulnerability to harm or illness, and enmeshment/undeveloped self), (3) impaired limits (EMSs of entitlement and insufficient self-control/self-discipline), (4) other-directedness (EMSs of self-sacrifice, subjugation, and approval-seeking/recognition seeking), and (5) over-vigilance and inhibition (EMSs of emotional inhibition, unrelenting standards/hypercriticalness, negativity/pessimism, and punitiveness). (Young, Klosko and Weishaar, 2003). Although studies broadly support the internal consistency of the defined EMSs across a range of clinical and nonclinical populations in western and non-western cultures via confirmatory factor analysis (Hawke & Provencher, 2012; Philips et al., 2016; Sakulsriprasert et al., 2016; Yalcin et al., 2020), substantial disagreement remains regarding the validity of the five higher-order schema domains (Kriston et al., 2012).

Irrational beliefs and early maladaptive schemas (EMSs) share conceptual similarities as rigid and inflexible views about the world that contribute to maladaptive functioning. For instance, the EMS of unrelenting standards/hypercriticalness closely aligns with Ellis's irrational belief of demandingness, both representing an individual's tendency to place unrealistic expectations and demands upon their environment. However, it's important to note that the cognitions most often associated with problematic anger are appraisals directly tied to anger-inducing events rather than general beliefs across contexts.

Despite their apparent similarities, few studies have explicitly examined the relationship between Ellis's irrational beliefs and Young's EMSs. One study conducted on an undergraduate population (Sava et al., 2009) provided some intriguing insights:

1. EMSs in the domains of other-directedness and impaired autonomy and performance were most positively related to low frustration tolerance.
2. Awfulizing was linked to most EMSs, except for those included in the other-directedness domain.
3. Interestingly, demandingness was not significantly related to any of the maladaptive schemas, which may be due to the non-clinical nature of the sample.

These findings suggest that while there are some overlaps between irrational beliefs and EMSs, there are also distinct differences. The lack of a relationship between demandingness and EMSs, in particular, highlights potential divergences between these concepts. At the very least, it provides evidence that the instruments used to assess irrational beliefs versus maladaptive schemas measure different constructs, even if they share some conceptual similarities. This distinction emphasizes the importance of considering both irrational beliefs and EMSs when examining cognitive factors in anger.

There have been decidedly more studies exploring the relationship between EMSs and anger, aggression, and hostility. Notably, trait anger, as measured by the STAXI-2, has been found to be related to the EMSs of mistrust/abuse, entitlement/grandiosity, and insufficient self-control (Askari, 2019; Calvete et al., 2005; McKee et al., 2012). These studies, however, used total trait anger scores rather than differentiating between anger-in and anger-out expressions. In research focused on aggressive individuals, without specifically measuring anger suppression or affective anger, the same schemas emerged

as most related to problematic behaviors (Crawford and Wright 2007; Dunne et al. 2018; Tremblay and Dozois 2009).

While no studies have directly examined the relationship between irrational beliefs, maladaptive schemas, and dysfunctional anger, related research provides some insights. A recent study by Turner et al. (2019) revealed that the EMSs of defectiveness, failure to achieve, and unrelenting standards fully mediated the positive relationship between irrational beliefs and symptoms of anxiety and depression in student-athletes. The authors propose that these findings support interventions integrating Rational Emotive Behavior Therapy (REBT) and schema therapy, aiming to refute self-condemning thoughts while using imagery and other techniques to change the meaning of emotional memories and images. If a similar relationship were found between dysfunctional anger and irrational beliefs, it would suggest that early maladaptive schemas, rather than irrational beliefs alone, are drivers of maladaptive anger.

The Current Study

Despite a rich body of research suggesting that individuals experiencing problematic anger vary in how that anger is experienced, no study has examined how cognitive appraisals and distortions differ between modes of anger experience and expression during emotion-inducing aversive situations. This study addresses this gap by examining participants' reported emotions and cognitions in anger-provoking social scenarios. The study's objectives are threefold:

1. To assess the effectiveness of the Anger Disorders Scale (ADS) in identifying individuals who exhibit higher levels of anger and greater dysfunction related to anger.

2. To examine whether there are significant differences in the cognitive experience of problematic anger across gender, age, and type of anger expression (anger-in vs. anger-out).
3. To determine the relationship between types of anger expression, early maladaptive schemas, and irrational beliefs.

These objectives aim to better understand the cognitive processes underlying different anger experiences and expressions. By integrating the ATSS paradigm with quantitative measures of anger expression and early maladaptive schemas, this study seeks to bridge the gap between theoretical models of anger and real-world experiences of dysfunctional anger.

Hypotheses

Hypothesis 1

Self-reported STAXI and ADS scores will significantly predict baseline and induced anger levels, as well as early maladaptive schemas (YSQ-R).

Hypothesis 2

The relationship between self-reported anger variables (STAXI Trait Anger and ADS Total Score) and endorsed early maladaptive schemas will be moderated by the level of induced anger, such that the relationship will be stronger at higher levels of induced anger. This hypothesis acknowledges the importance of state anger in addition to trait anger, recognizing that momentary emotional states can significantly influence the expression of underlying schemas and trait-level anger tendencies.

Hypothesis 3

Irrational beliefs (as defined by REBT) will be significantly associated with higher scores on measures of anger dysfunction (ADS Total Score) and trait anger (STAXI Trait Anger).

Hypothesis 3a. Demandingness will be the most frequently articulated cognitive distortion or irrational belief across all subjects.

Hypothesis 3b. Awfulizing and Inflammatory Labeling will predict higher Anger-out-related scores (STAXI Expression and ADS Reactivity) but not Anger-In scores (ADS Anger In).

Hypothesis 4

Different early maladaptive schemas will show distinct patterns of association with specific dimensions of anger expression and experience.

Hypothesis 4a. Punitiveness (Others) and Negativity scores will be significantly associated with general trait anger and anger dysfunction (STAXI Trait Anger and ADS Total Score).

Hypothesis 4b. Fear of Losing Control and Insufficient Self Control will be significantly associated with anger subscales representing anger-out (STAXI Anger-Out, ADS Reactivity).

Hypothesis 4c. Emotional Constriction and Approval-seeking will be significantly associated with anger-in scores (STAXI Anger In).

Hypothesis 5

EMSs (YSQ-R scores) will both moderate and mediate the relationship between irrational beliefs and anger dysfunction (STAXI Trait Anger and ADS Total Score).

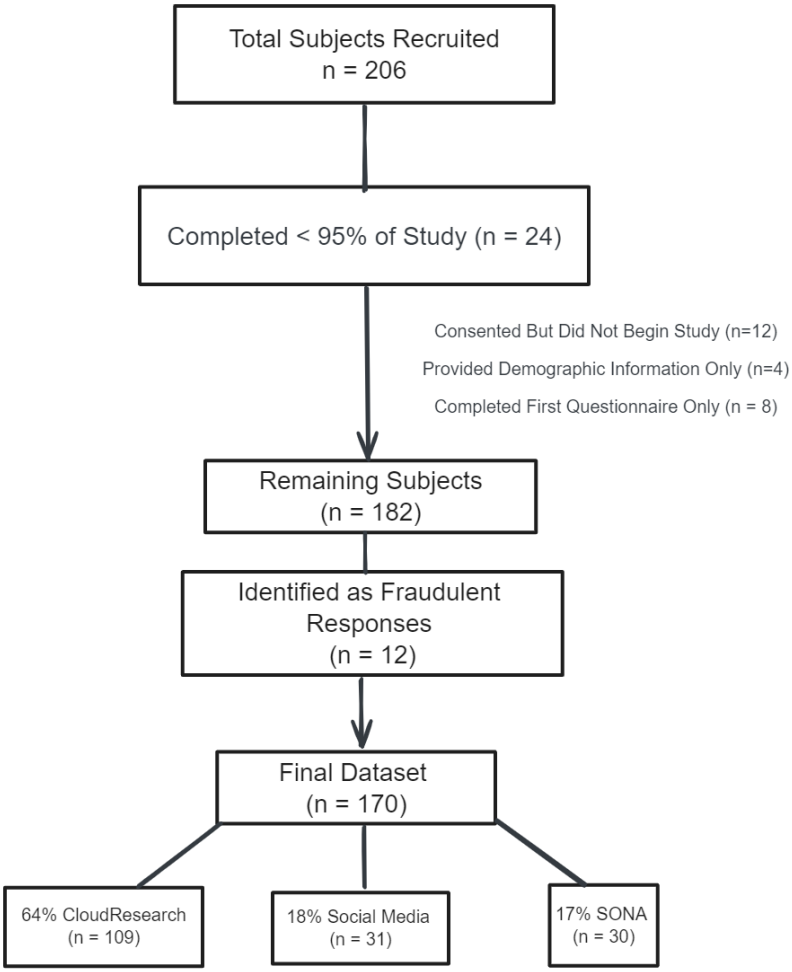
METHOD

Participants and Recruitment

A total of 206 participants were recruited through social media, St. John's University's SONA research participation system, and via the CloudResearch Connect platform, a reputable online service that facilitates the recruitment of high-quality research participants (Hartman et al., 2023). The study was posted to several general interest Facebook groups, as well as special interest mental health groups for individuals looking for anger management resources, advice regarding relationship issues, and general mental health support. These special interest groups were targeted in order to increase the variability of the subject pool in the supposition that individuals frequenting these pages would have higher rates of dysfunctional anger and early maladaptive schemas. Subjects who answered less than 95% of the survey questions were excluded from the dataset. This exclusion step removed 24 participants, resulting in 182 remaining participants. Among those removed, half had consented to the study but did not begin it. Additionally, 4 participants provided demographic information but did not proceed with the survey, and 8 participants completed the first questionnaire, the STAXI, before discontinuing. Twelve participants who completed the survey were identified as probable fraudulent or "bot" responses by Qualtrics and were also removed from the dataset. The final dataset comprised 170 subjects. Approximately 64% of the final dataset was collected via CloudResearch, 17% via SONA, and 18% via social media. Figure 1 illustrates the data-cleaning process.

Figure 1

Subject Recruitment and Data Cleaning Process



Measures

The State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999)

The STAXI-2 is a revised and expanded version of STAXI with 44-57 items. This scale aims to measure the experience, expression, and control of anger. The STAXI-2 measures both state and trait anger and includes three subscales: expression of angry feelings toward other persons or objects in the environment (Anger Expression-Out), holding in or suppressing angry feelings (Anger Expression-In), controlling angry

feelings by preventing the expression of anger toward other persons or objects in the environment (Anger Control-Out), and controlling suppressed angry feelings by calming down or cooling off (Anger Control-In). The STAXI-2 is the most commonly used instrument measuring the experience and management of anger and has proven to be a reliable and valid instrument across ages, clinical and nonclinical populations, and cultures (Eckhardt, Norlander, & Deffenbacher, 2004; Lievaart et al., 2016).

The Anger Disorders Scale (ADS; DiGiuseppe & Tafrate)

The ADS is a 74-item inventory with five dimensions: (1) Provocations, (2) Arousal (3) Cognitions, (4) Motives, and (5) Behaviors. There are three higher-order factor scores generated by the ADS derived from a principal axis factor analysis of all dimensions and variables: (1) Anger In, comprised of Hurt/Social Rejection, Episode Length, Suspiciousness, Resentment, Tension Reduction, and Rumination, (2) Expression/Reactivity comprised of: Scope of Anger, Provocations, Physiological Arousal, Duration of Anger Problems, Rumination, Impulsivity, Coercion, and Verbal Expression, and (3) Vengeance, comprised of revenge and coercion, as well as most of the aggressive behaviors. The ADS has good convergent validity with the Speilberger (1988) State-Trait Anger Expression Inventory (STAXI) and the Buss and Perry (1992) Aggression Questionnaire (AQ) (DiGiuseppe & Tafrate, 2004).

Articulated Thoughts in Simulated Situations (Davison, 1983)

The Articulated Thoughts in Simulated Situations (ATSS) paradigm, developed by Davison (1983), serves as a qualitative content analysis method to capture individuals' immediate thoughts in response to various scenarios. Unlike traditional methods that require participants to retrospectively report their thoughts or feelings, the ATSS allows

for real-time articulation, offering valuable insights into complex interpersonal issues and psychopathology. This approach has demonstrated greater ecological validity than other scenario-based procedures designed to elicit anger (Slotter et al., 2012). In the realm of anger and aggression research, the ATSS has predominantly been applied to male subjects with histories of problematic aggression (Eckhardt and Kassinove, 1998; Barbour et al., 1998; Pan et al., 1994; Eckhardt and Jamison, 2002; Eckhardt et al., 2002; DiLiberto et al., 2002; Persampiere et al., 2015; Tonnaer et al., 2020).

One of the limitations of the ATSS is that findings depend on the scenarios being relevant and realistic to the population of interest (Davison et al., 1997). Previously, the scripted scenarios used for anger research with the ATSS were specific to intimate partner violence perpetrators. To expand the definition of dysfunctional anger, this study adapted scenarios to be relevant for a general population. In a completed study aimed at soliciting anger-inducing content ideas for the revised Anger Cognitions Scale (ACS-R), approximately 600 participants were asked about their emotional reactions (sad, irritated, angry, anxious, frightened) to 79 scenarios on a 7-point Likert scale. These scenarios were derived from Mabel's (1994) work examining characteristics intrinsic to anger provocation. Scenarios were equally distributed among romantic partners, family members, colleagues, friends, or strangers, in recognition that the intensity of anger may differ based on the type of relationship and, therefore, the target of the anger. Three scenarios were chosen from the top ten anger scenarios that reliably induced anger the most frequently and intensely across participants. The reason for not simply selecting the top three scenarios is that some were not adaptable to the limitations of the ATSS. Since participants are asked to imagine themselves in a provoking situation without

participating themselves, ATSS scenarios are often written as the participant overhearing a conversation between two others after being given situational context. Some highly rated anger provocations involving participant physical contact or participation, such as, "You are walking by a stranger, and they push past you," could not be adapted for this reason. Further, scenarios were altered to allow for remote, on-screen study deployment, so instead of "overhearing" conversations, subjects would read conversations between two other parties as if they were text messages or a workplace messaging program.

With these considerations in mind, themes of being the object of dishonesty, broken promises, or being disappointed by others and being treated unfairly, unkindly, or in a prejudicial way were adapted to scenarios involving family members and work colleagues. Specifically, the scripts involved: (1) the participant imagining that they helped a family member get a job through a work connection and a co-worker shows them a text message exchange in which this family member is speaking badly about them to mutual colleagues, (2) the participant imagining working longer hours and canceling plans due to work/school obligations, and then seeing a conversation between two colleagues speaking about their lack of effort, and (3) the participant informing a family member they have been laid off, asking them to keep this information secret, and then this family member telling other family members and discussing their difficulty in obtaining a new position in a family group chat. Scripts were written to minimize the possibility that the participant blames themselves for the current scenario, for instance, attributing being laid off and having difficulty obtaining a position to neutral causes. The full scenarios and context can be found in Appendix B.

Young Schema Questionnaire – Revised (YSQ-R; Yalcin et al, 2022)

The YSQ-R, an updated edition of the Young Schema Questionnaire initially created by Jeffrey Young, is designed to assess the intensity of Early Maladaptive Schemas (EMS) (Young, 1994). This scale comprises 116 items that evaluate 20 different subscales, each corresponding to a distinct EMS. Each item presents a statement, such as "I worry that people I feel close to will leave me or abandon me" or "I find the responsibilities of everyday life overwhelming," and participants rate these on a scale from 1 (Not at all true for me) to 6 (Completely true for me). Subscale scores are determined by averaging the items within each subscale, and an overall score is obtained by summing the scores of all 116 items. One is considered to have an elevated schema if the mean of their scores for each subscale is above 4.

Although the YSQ-R is a relatively new version of the YSQ, it is very similar to the YSQ-Short Form, which has continually demonstrated good reliability and construct validity in studies of undergraduate student populations, outpatient and inpatient clinical populations, and across adolescents and elderly individuals (Saritas & Gençöz, 2011; Soygut, Karaosmanoglu, & Cakır, 2009; Calvete et al., 2013; Lyrakos, 2014; Philips, 2015). However, as discussed previously, while the separate EMSs consistently emerge in confirmatory factor analyses of the YSQ-R, YSQ-R and other earlier forms of the YSQ, the higher-order schema domains proposed by Young have not been widely supported (Yan et al., 2018). As a result, this study will use the individual schemas as variables and will not use calculated higher-order schema domain scores. Of note, the research which guided the creation of the YSQ-R indicated that punitiveness best fits into two separate subscales of punitiveness at others and punitiveness at the self and that

emotional inhibition best fits into two separate subscales of emotional constriction and fear of losing control (Yalcin et al., 2021). This method of scoring was particularly relevant considering the nature of this study and the relationship between these proposed subscales and anger.

Study Administration

Participants were administered the study via the online research platform Qualtrics. They were presented with written instructions stating that people often have different thoughts and feelings about what is happening around them and that these thoughts often occur rapidly in reaction to the environment. The instructions described that they would read three different scenarios, and following each scenario, they would be instructed to rate their mood (sad, angry, happy, relaxed, anxious), using a Likert-type scale from 1 (not at all) to 7 (extremely). Then, participants will be instructed to focus on their own thoughts and feelings and type whatever comes into their minds. Before reading each scenario, relevant context will be provided as necessary. The order of scenarios was counterbalanced across the participants. Following the administration of the ATSS, participants were administered the YSQ-R.

Qualitative Coding

Recordings of the participants' speech were coded for Emotional Responses (differentiated between adaptive and disturbed), Irrational Beliefs (Demandingness, Inflammatory Labeling, Self-Derogatory Labeling, Frustration Intolerance, Catastrophic Evaluation), Cognitive Distortions (Code of Honor, Personalization, Overgeneralization, Mind Reading, Hostile Attribution Bias), Type of Aggression (Physical, Verbal, Indirect,

Relational, Passive), Motives, Provocation, Physiological Arousal, Negative Coping, and Positive Coping. The full coding manual can be found in Appendix C.

To establish interrater reliability, I collaborated with a pre-doctoral student who possessed foundational knowledge of many of the codes used in this research due to her prior experience with the Anger Disorders Scale (ADS) in previous projects within the anger research lab. We met for approximately one hour to review the study protocol and coding manual and discuss potential areas of difficulty in the coding process. Subsequently, the student was provided with the coding manual, a randomly selected subset comprising 20% of the total sample, and the corresponding anger scenarios to ensure appropriate context for coding. This approach aimed to ensure consistency and reliability in the qualitative data analysis process.

Interrater reliability was assessed using Cohen's kappa on a subset of 20% of the total sample, consistent with accepted qualitative research practices (Lombard et al., 2002). This approach resulted in a kappa value of .88, indicating almost perfect agreement between raters, according to the scale proposed by Landis and Koch (1977). The analysis included 607 data items from the subset, with 541 agreements and 66 disagreements, yielding a percentage agreement of 89.13%. The coding categories encompassed Emotional Responses, Irrational Beliefs, Cognitive Distortions, Aggression, Motives, Provocation, Physiological Arousal, Negative Coping, and Positive Coping, with errors of omission and commission distributed across these categories. This high level of agreement on a substantial subset of the data suggests strong overall reliability in the coding process. Although they were relatively few, most disagreements occurred in discriminating between “adaptive thinking” and “problem-solving”, and between

provocations, which will be considered in revisions of the coding manual for future studies.

RESULTS

Data Preparation and Cleaning

Initially, I assessed the extent and pattern of missing data using descriptive statistics and visualizations such as missing data matrices and heatmaps. The missing data occurred slightly more frequently towards the end of the study, indicating a non-random pattern. Little's MCAR test was conducted to determine whether the missing data was missing completely at random. Despite the observed pattern, the test was not significant, χ^2 (37948) = 535.0, p = 1.0, indicating that the missing data is likely missing completely at random (MCAR). Multiple imputation by chained equations (MICE) was used to estimate and replace missing values. This method was chosen to provide unbiased parameter estimates and account for the uncertainty associated with the imputed values. The imputation model included all variables used in the primary analysis to preserve the relationships between them. After imputation, diagnostic checks were conducted to compare the distributions of observed and imputed data to ensure that the imputed values were consistent with the observed data and that the imputation process did not distort the underlying data structure. Finally, the results were pooled using Rubin's rules (Rubin, 1987) to combine the estimates from multiple imputed datasets, thus providing robust and comprehensive results that account for the variability introduced by the imputation process. Sensitivity analyses were also conducted, confirming that the imputed values are plausible and do not introduce significant bias.

Demographics

The combined sample statistics are summarized in Table 1. As expected, due to convenience sampling with the undergraduate student population, our overall sample was slightly younger than the median national age (U.S. Census Bureau, n.d.), with

participants ranging in age from 18 to 49 years old (M = 31.83, SD = 11.77), with more females (55.9%) than males (43%). The sample was diverse and included a variety of racial and ethnic backgrounds, sexualities, and educational levels, providing a broad demographic representation.

Table 1

Combined Sample Statistics

Variable	Sample Statistic	
N	170	
Mean Age; M (SD)	31.83 (11.77)	
Gender	Female	55.9%
	Male	43%
	Nonbinary or Other	1.2%
Sexuality	Heterosexual	78.2%
	Homosexual	4.7%
	Bisexual	12.9%
	Other	4.2%
Race/Ethnicity	White	62.9%
	Hispanic/Latino	4.7%
	Black or African Heritage	17.7%
	Asian	8.4%
	Mixed Race or Other	5.3%
Education	Some High School	.6%
	High School Diploma or GED	17%
	Some College	25.3%
	Junior College or Associate's	7.1%
	College Degree, Bachelor's	34.7%
	Master's Degree	10.6%
	Doctoral, Law, or Professional Degree	4.7%

One-way analyses of variance (ANOVAs) were conducted to examine the potential influence of demographic factors on anger-related scores and schema elevations. Anger-related dependent variables included: Anger Disorders Scale (ADS) Total Score, ADS Anger-In, ADS Vengeance, ADS Reactivity, State-Trait Anger Expression Inventory (STAXI) Trait Anger, STAXI Anger Control, STAXI Anger Expression, Average induced anger across all three scenarios (Induced Anger), and

Baseline Anger. Schema-related dependent variables included the Total Young Schema Questionnaire-Revised (YSQ-R) Score and the number of elevated schemas. Schema subscales were considered "elevated" per YSQ-R scoring standards of "4" or higher. No statistically significant differences emerged across gender categories, race/ethnicity, sexual orientation, or education levels for any dependent variable (all p-values > .05).

Although average-induced anger did not differ significantly across genders, one-way ANOVAs were also conducted for the additional mood ratings to assess if other moods experienced as a consequence of the scenarios varied between genders. Females reported significantly higher levels of anxiety (M = 4.47) compared to males (M = 3.75) as a reaction to the scenarios ($F(1,168) = 9.39$, $p < 0.01$). The effect size (Cohen's d = 0.48) suggests a medium effect, indicating that the gender difference in anxiety levels is both statistically significant and clinically meaningful. There was also a significant difference between genders ($F(1,168) = 4.02$, $p < 0.05$) for average induced sadness across scenarios, with females reporting higher levels of sadness (M = 4.15) compared to males (M = 3.63). The effect size (Cohen's d = 0.31) suggests a small to medium effect, indicating that the gender difference in sadness levels, while statistically significant, may not be as meaningfully different as anxiety. There was also a significant difference in average relaxed mood between genders in reaction to the scenarios ($F(1,168) = 7.34$, $p < 0.01$), with males reporting slightly higher levels of feeling relaxed on average (M = 2.97) compared to females (M = 2.36). The effect size (Cohen's d = -0.42) suggests a small to medium effect, indicating that the gender difference in relaxation levels is statistically significant and of moderate practical importance. There were no significant

differences between genders for self-reported happy and frightened moods following the scenarios.

A series of linear regressions examined the relationship between age and the same dependent ADS, STAXI, YSQ-R, and mood-related variables (baseline and average-induced anger across scenarios). The results indicated that age was significantly related to almost all dependent variables, suggesting that self-reported anger and early maladaptive schemas decrease as age increases. These results appear in Table 2. On the STAXI, age was found to be negatively associated with Anger Expression, R^2= .094, $F(1, 168) = 17.12$, $p < .001$, $\beta = -.203$, $t(168) = -.35$, and Trait Anger, $R^2 = .078$, $F(1, 168) = 14.13$, $p < .001$, $\beta = -.141$, $t(168) = -.32$, $p < .001$, and positively associated with Anger Control, $R^2 = .075$, $F(1, 168) = 13.33$, $p < .001$, $\beta = 0.23$, $t(168) = .31$, $p < .001$.

On the ADS, age was negatively associated with Total Scores, adjusted $R^2 = .062$, $F(1, 168) = 11.01$, $p = .001$, $\beta = -.258$, $t(168) = -.28$, Reactivity, adjusted $R^2 = .066$, $F(1, 168) = 11.67$, $p < .001$, $\beta = -.115$, $t(168) = -.29$, Anger In, adjusted $R^2 = .050$, $F(1, 168) = 8.74$, $p = .004$, $\beta = -.091$, $t(168) = -0.25$, and Vengeance Scores, adjusted $R^2 = .036$, $F(1, 168) = 6.28$, $p = .013$, $\beta =$, $t(168) = -21$. Age was also negatively related to baseline anger ratings, $R^2 = .045$, $F(1, 168) = 7.73$, $p = .006$, $\beta = -.027$, $t(168) = -0.24$. No significant relationship was found between age and induced anger, adjusted $R^2 = .000$, $F(1, 168) = 0.07$, $p = .792$, $\beta = .003$, $t(168) = 0.26$. These findings suggest that as individuals age, they tend to express less anger, have better anger control, and generally score lower on various measures of anger. However, the relationships are relatively weak, indicating that other factors also play important roles in determining these anger-related traits. Age was a statistically significant predictor of total YSQ-R scores, adjusted $R^2 = .061$, $F(1,168) =$

10.70, p = .001, β = -2.48, t(168) = -3.27, but not of the total number of elevated schemas, adjusted R^2 = .021, $F(1,166)$ = 3.53, p = .062, β=-.073.

Table 2

Linear Regression Analysis: Age as a Predictor of Anger and Schema-Related Variables

Variable	R^2	$F(1, 168)$	p	β	Intercept
STAXI					
Expression***	.094	17.12	<.001	-.203	39.06
Trait Anger***	.078	14.13	<.001	-.141	22.57
Anger Control***	.075	13.33	<.001	.230	39.37
ADS					
Total Score**	.062	11.01	.001	-.258	43.60
Reactivity***	.066	11.67	<.001	-.115	16.54
Anger-In**	.050	8.74	.004	-.091	17.73
Vengeance*	.036	6.28	.013	-.066	10.57
Mood Ratings					
Baseline Anger**	.045	7.73	.006	-.027	2.87
Induced Anger	.000	0.07	.792	.003	4.77
YSQR					
Total Score**	.061	10.70	.001	-2.48	408.85
# of Elevated Schemas	.021	3.53	.062	.073	6.84

NOTE: *p <.05;**p<.01;***p<.001

Group Differences on Psychological Measures

Since the overall sample was recruited via different methods, one-way ANOVAs were conducted to see if there were significant differences between recruitment groups on anger and schema-related variables. Although subjects recruited via CloudResearch and SONA showed no significant differences, subjects recruited via social media had significantly higher scores across many anger and schema-related variables. For ADS Total Scores, there was a significant effect of sampling method groups, $F(2, 167) = 24.36$, $p < .001$. Post hoc comparisons using Tukey's HSD test indicated that the mean score for the social media recruited group (M = 47.31) was significantly higher than both the CloudResearch group (M = 32.74) and the undergraduate SONA group (M = 32.28).

Similarly, for ADS Anger-In, the ANOVA showed a significant effect, $F(2, 167) = 7.54$, $p < .001$, with the social media group ($M = 17.66$) differing significantly from the CloudResearch group ($M = 14.28$) and the undergraduate SONA group ($M = 13.83$). ADS Vengeance also showed significant differences, $F(2, 167) = 28.31$, $p < .001$, with the social media group ($M = 12.66$) again being significantly different from the CloudResearch group ($M = 7.64$) and undergraduate SONA group ($M = 7.14$). ADS Reactivity demonstrated the same pattern with significant differences, $F(2,167) = 29.78$, $p < .001$, with the social media group having a notably higher mean (18.44) compared to the CloudResearch group (11.46) and the SONA undergraduate group (11.86). For STAXI Trait Anger, the sample group had a significant effect, $F(2, 167) = 24.35$, $p < .001$. Post hoc comparisons using Tukey's HSD test indicated that the mean score for the social media recruited group ($M = 47.31$) was significantly different from both the CloudResearch group ($M = 32.74$) and the undergraduate SONA group ($M = 32.28$). Similarly, for STAXI Expression, the ANOVA showed a significant effect between the groups, $F(2, 167) = 11.37$, $p < .001$, with the social media group ($M = 38.09$) differing significantly from the CloudResearch group ($M = 31.04$) and the undergraduate SONA group ($M = 32.31$). STAXI Anger Control did not show significant differences between groups, $F(2, 167) = 1.66$, $p = .193$.

For YSQ-R Total Scores, the ANOVA was also significant, $F(2, 167) = 25.99$, $p < .001$, with the social media group ($M = 448.16$) differing significantly from the CloudResearch group ($M = 300.91$) and undergraduate SONA group ($M = 303.71$). The total number of elevated schemas also showed significant differences, $F(2, 167) = 25.64$, $p < .001$, with the social media group having an average of 10.38 elevated schemas in

comparison to the CloudResearch group ($M = 3.28$) and the undergraduate SONA group ($M = 2.55$). Finally, for baseline anger ratings, the ANOVA indicated significant differences, $F(2, 97) = 15.29$, $p < .001$, with the social media group ($M = 3.22$) differing significantly from the CloudResearch group ($M = 1.70$) and SONA undergraduate group ($M = 1.97$). Interestingly, no significant differences were found for induced anger across scenarios, $F(2, 97) = 2.10$, $p = .125$, with the CloudResearch group ($M = 4.95$), SONA undergraduate group ($M = 4.30$), and social media group ($M = 4.95$) showing similar means.

As expected, the social media group, on the whole, had higher self-reported anger dysfunction and YSQ-R scores, likely due to the targeting of special interest mental health groups. These subjects did not differ from other recruitment groups on any demographic variable. Age will be controlled in subsequent analyses to ensure that group differences do not confound the effects of other variables. However, the recruitment group will not be controlled, as the variability introduced by targeting different groups enhances the generalizability of the findings and reflects real-world differences in anger dysfunction across diverse populations.

Mood Induction

To assess the effectiveness of the anger-inducing scenarios, paired t-tests were used to compare baseline anger levels to anger levels after each scenario and between scenarios. These results appear in Table 3. Each of the three scenarios effectively increased the subjects' anger levels compared to their baseline levels. The very low p-values in all tests suggest that the observed increases in anger were not due to random chance, thereby confirming the efficacy of the mood induction procedures. Other

emotions were also compared to anger to ensure that if other negative emotions were induced, which was expected to a certain degree, anger was still the predominant emotion. This comparison was critical to validate that the scenarios specifically targeted anger rather than eliciting a generalized negative emotional response. The data showed that although there were increases in other negative emotions, such as sadness and anxiety, the increase in anger was significantly higher, supporting the targeted nature of the anger induction. The induced mood ratings across the scenarios are visualized in Figure 2.

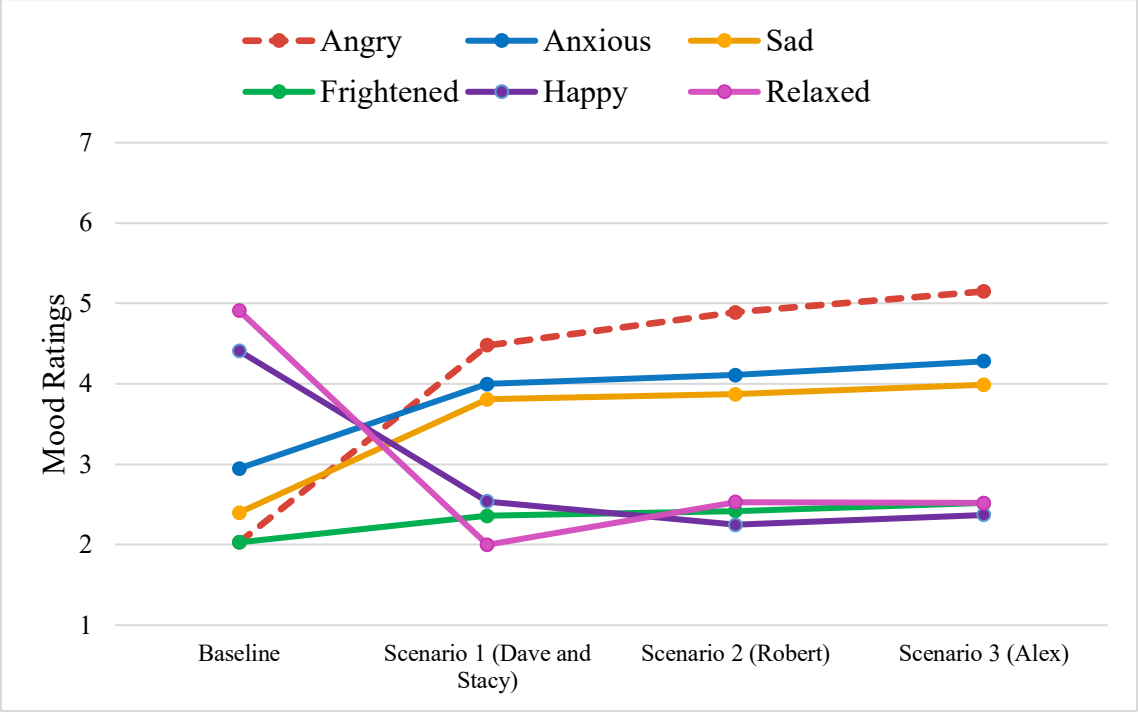
Table 3

Mean and Standard Deviations of Mood Ratings Across Scenarios

Mood Rating	Timepoint	Mean (SD)
Frightened	Baseline	2.03 (1.42)
	Scenario 1 (Dave and Stacy)	2.36 (1.63)
	Scenario 2 (Robert)	2.42 (1.75)
	Scenario 3 (Alex)	2.52 (1.80)
Happy	Baseline	4.41 (1.58)
	Scenario 1 (Dave and Stacy)	2.54 (1.69)
	Scenario 2 (Robert)	2.25 (1.72)
	Scenario 3 (Alex)	2.37 (1.78)
Angry	Baseline	2.03 (1.48)
	Scenario 1 (Dave and Stacy)	4.48 (1.81)
	Scenario 2 (Robert)	4.89 (1.83)
	Scenario 3 (Alex)	5.15 (1.66)
Anxious	Baseline	2.95 (1.80)
	Scenario 1 (Dave and Stacy)	4.00 (1.73)
	Scenario 2 (Robert)	4.11 (1.79)
	Scenario 3 (Alex)	4.28 (1.85)
Sad	Baseline	2.40 (1.61)
	Scenario 1 (Dave and Stacy)	3.81 (1.87)
	Scenario 2 (Robert)	3.87 (1.92)
	Scenario 3 (Alex)	3.99 (1.96)

Figure 2

Induced Mood Ratings Across Scenarios



Predicting Baseline and Induced Anger from STAXI and ADS Scores

Linear regression analyses were conducted to examine the predictive value of self-reported STAXI (State-Trait Anger Expression Inventory) and ADS (Anger Disorders Scale) scores on baseline and induced anger, revealing significant relationships between various anger-related subscales and observed anger states.

Prior to conducting the analyses, the assumptions of linear regression were assessed. All independent variables' Variance Inflation Factor (VIF) values were below 5, indicating no significant multicollinearity. The normality of residuals was confirmed through normality tests, with p-values greater than 0.05 suggesting that the residuals are normally distributed. The Durbin-Watson statistics for all models were close to 2, indicating no significant autocorrelation in the residuals. Diagnostic plots, including Q-Q

plots, Residuals vs. Fitted, Scale-Location, and Residuals vs. Leverage, were examined to assess linearity, homoscedasticity, and the presence of influential points. Overall, the assumptions of normality, homoscedasticity, absence of multicollinearity, and independence of errors were satisfactorily met, supporting the validity of our regression models. To ensure the robustness of the regression analyses, all variables were centered to make the data more interpretable and mitigate potential multicollinearity issues.

To control the family-wise error rate across all these tests, the Bonferroni correction was applied. This correction adjusts the significance level (α) by dividing it by the total number of tests performed. This ensures that the overall probability of making one or more Type I errors remains at the desired level (typically 0.05). 32 tests were conducted (2 dependent variables × 7 predictors). Therefore, the Bonferroni-corrected significance level (α') was = .00357.

Linear regression analyses revealed significant associations between various subscales of the Anger Disorders Scale (ADS) and the State-Trait Anger Expression Inventory (STAXI) with both baseline and induced anger states. Notably, the ADS Total, Anger-In, Vengeance, and Reactivity subscales demonstrated positive correlations with increased levels of baseline and induced anger. Similarly, the STAXI Trait Anger and Expression subscales showed positive associations with heightened baseline and induced anger, while the Anger Control subscale exhibited a negative relationship with baseline anger. The predictive power of these measures was substantial, with regression models accounting for up to 35.3% of the variance in baseline anger and 17.6% in induced anger. Complete statistics can be found in Table 4. The key findings are below:

Table 4

Linear Regression Analyses: STAXI and ADS Scores as Predictors of Baseline and Induced Anger

Predictor	B	β	SE	*p*	*F*(2, 167)	Adjusted R^2
Baseline Anger						
ADS Total	0.07	0.56	0.008	<.001	43.58	.335
ADS Anger-In	0.14	0.45	0.021	<.001	25.40	.224
ADS Vengeance	0.19	0.52	0.024	<.001	36.76	.297
ADS Reactivity	0.16	0.58	0.018	<.001	47.10	.353
STAXI Trait Anger	0.13	0.51	0.017	<.001	33.63	.279
STAXI Control	-0.05	-0.33	0.011	<.001	13.84	.132
STAXI Expression	0.01	0.51	0.013	<.001	32.65	.273
Average Induced Anger						
ADS Total	0.05	0.35	0.01	<.001	11.19	.108
ADS Anger-In	0.12	0.38	0.025	<.001	13.17	.126
ADS Vengeance	0.10	0.26	0.031	<.001	5.86	.054
ADS Reactivity	0.08	0.28	0.024	<.001	6.58	.062
STAXI Trait Anger	0.09	0.33	0.021	<.001	9.50	.091
STAXI Control	-0.02	-0.14	0.013	.084	1.54	.006
STAXI Expression	0.09	0.45	0.015	<.001	19.09	.176

Note. B = unstandardized regression coefficient; β = standardized regression coefficient; SE = standard error. Bonferroni-corrected significance level: p < .00357.

ADS Total scores significantly predicted both baseline anger (β = 0.07, $p < .001$) and induced anger (β = 0.05, $p < .001$). This suggests that for every unit increase in ADS total score, baseline anger increased by approximately 0.07 units, and induced anger increased by approximately 0.05 units. The overall model for baseline anger was significant, $F(2, 167) = 43.58$, $p < .001$, and explained approximately 33.5% of the total variance, adjusted $R^2 = .335$. The model was also significant for induced anger, $F(2, 167) = 11.19$, $p < .001$, explaining approximately 10.8% of the total variance, adjusted $R^2 = .108$.

ADS Anger-In subscale scores significantly predicted baseline anger (β = 0.14, $p < .001$) and induced anger (β = 0.12, $p < .001$), suggesting that for every unit increase in ADS total score, baseline anger increases by approximately 0.14 units, and induced anger increases by 0.12 units. The overall model for baseline anger was significant, $F(2, 167) =$

25.40, $p < .001$, and explained approximately 22.4% of the variance in baseline anger, $R^2 = .224$. The regression model for induced anger was also significant, $F(2, 167) = 13.17$, $p < .001$, and explained approximately 12.6% of the variance in average anger, adjusted $R^2 = .126$

ADS Vengeance subscale scores significantly predicted baseline anger ($\beta = 0.19$, $p < .001$) and induced anger ($\beta = 0.10$, $p < .001$). This suggests that for every unit increase in ADS total score, baseline anger increased by approximately 0.19 units, and induce anger increased by .10 units. The regression model for baseline anger was significant, $F(2, 167) = 36.76$, $p < .001$, and explained approximately 29.70% of the variance in baseline anger, adjusted $R^2 = .297$. The overall regression model for induced anger was also significant, $F(2, 167) = 5.85$, $p < .001$, but only explained 5.4% of the variance in average anger, adjusted $R^2 = .054$.

The ADS Reactivity subscale significantly predicted baseline anger ($\beta = 0.16$, $p < .001$) and induced anger ($\beta = 0.08$, $p < .001$). This suggests that for every unit increase in ADS reactivity, baseline anger increased by approximately 0.16 units, and induced anger increased by approximately .08 units. The regression model for baseline anger was significant, $F(2, 167) = 47.09$, $p < .001$, and explained approximately 35.3% of the variance in baseline anger, adjusted $R^2 = .353$. The regression model for induced anger was significant, $F(2, 167) = 6.57$, $p < .001$, and explained approximately 6.2% of the variance in induced anger, adjusted $R^2 = .062$.

The STAXI Trait Anger subscale significantly predicted baseline anger ($\beta = 0.13$, $p < .001$) and induced anger ($\beta = 0.09$, $p < .001$). This suggests that for every unit increase STAXI Trait Anger, baseline anger increased by approximately 0.13 units, and

induced anger increased by approximately .09 units. The regression model for baseline anger was significant, $F(2, 167) = 33.63$, $p < .001$, and explained approximately 27.9% of the variance in baseline anger, $R^2 = .279$. The regression model for induced anger was significant, $F(2, 167) = 9.50$, $p < .001$, and explained approximately 9.1% of the variance in induced anger, $R^2 = .091$.

The STAXI Anger Control subscale significantly predicted baseline anger ($\beta = -0.05$, $p < .001$) but not induced anger. This suggests that for every unit increase in STAXI Anger Control, baseline anger decreased by approximately 0.05 units. The regression model for baseline anger was significant, $F(2, 167) = 13.84$, $p < .001$, and explained approximately 13.2% of the variance in baseline anger, adjusted $R^2 = .132$. The regression model for induced anger was not significant, $F(2,167) = 1.54$, $p = .084$, adjusted $R^2 = .006$.

The STAXI Expression subscale significantly predicted baseline anger ($\beta = 0.10$, $p < .001$) and induced anger ($\beta = 0.09$, $p < .001$). This suggests that for every unit increase in STAXI Expression, baseline anger increased by approximately 0.10 units, and induced anger increased by approximately .09 units. The regression model for baseline anger was significant, $F(2, 167) = 32.65$, $p < .001$, and explained approximately 27.3% of the variance in baseline anger, adjusted $R^2 = .273$. The regression model for induced anger was also significant, $F(2, 167) = 19.09$, $p < .001$, and explained approximately 17.60% of the variance in induced anger, adjusted $R^2 = .176$.

Moderation Analyses: State Anger's Effect on the Relationship Between Anger Variables and Early Maladaptive Schemas

To examine whether the relationship between self-reported dysfunctional anger (ADS Total Score) and the Number of Elevated Schemas was moderated by average induced-anger across scenarios (induced anger), I conducted a moderation analysis with age as a control variable. The results of the regression analysis appear in Table 5. The overall model was significant, $F(4, 165) = 32.55$, $p < 0.001$, and explained 42.7% of the variance in Total Elevated Schemas ($R^2 = 0.427$).

The main effect of ADS total score was statistically significant ($t = 7.35$, $\beta = .25$, $p < .001$), suggesting that, on average, there is a significant linear relationship between ADS total score and the number of elevated schemas when controlling for other variables in the model. The main effect of induced anger was also statistically significant ($\beta = .68$, $t = 2.75$, $p = .007$). This indicates that higher levels of induced anger are associated with greater numbers of elevated schemas, controlling for other variables.

The interaction term between ADS total score and induced anger was also statistically significant ($\beta = .070$, $p < .001$), suggesting that the level of induced anger moderates the relationship between self-reported dysfunctional anger and the number of elevated schemas. The positive coefficient suggests that for individuals with higher levels of induced anger, there is a stronger positive relationship between self-reported dysfunctional anger and the number of elevated schemas. For individuals with lower levels of induced anger, the relationship between self-reported dysfunctional anger and the number of elevated schemas is weaker or potentially negative. At lower levels of induced anger (-1 SD), the simple slope was .14, and marginally statistically significant (t

= 2.52, $p = 0.013$). At high levels of induced anger (+1 SD), the simple slope increased to 0.36, and was statistically significant (t = 9.61, $p < .001$).

Table 5

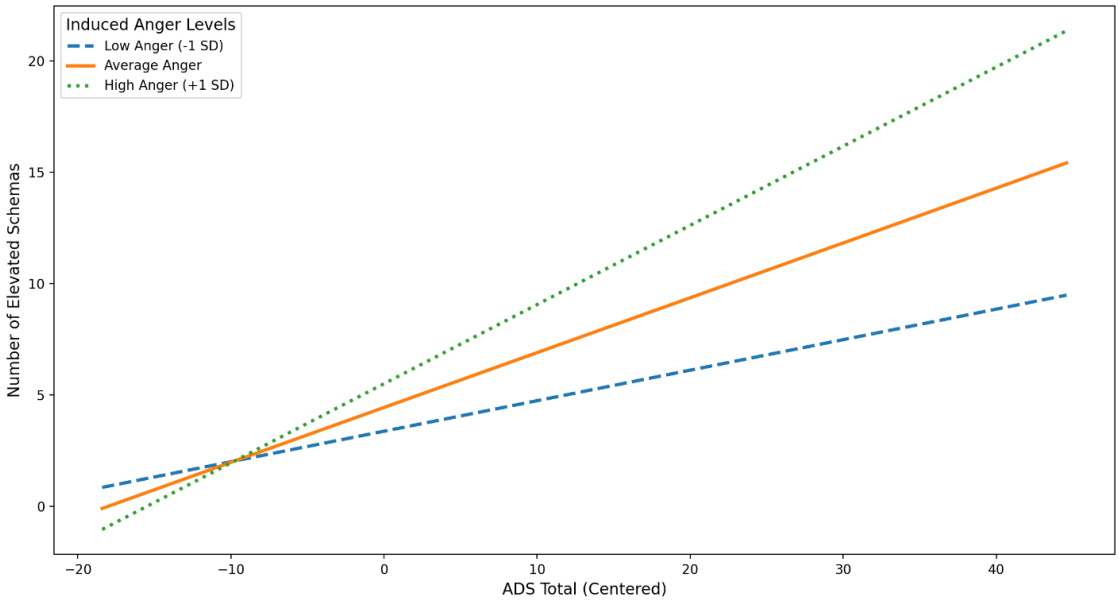
Linear Regression Analysis: ADS Total and Induced Anger as Predictors of Number of Elevated Schemas with Interaction Effect

Predictor	β (SE)	t	p
Main Effects			
ADS Total Score	.25 (.034)	7.35	<.001
Induced Anger	0.68 (.25)	2.75	.007
Interaction Effect			
ADS Total Score × Induced Anger	0.070	3.383	<.001
Control Variables			
Age	-.0012	-.039	.697
Model Summary: $F(4, 165) = 32.55$, $p < 0.001$, $R^2 = 0.427$			

Note: β = standardized regression coefficient; t = t-statistic; p = p-value

Figure 3

Moderation Effect of Induced Anger on the Relationship between ADS Total Score and Number of Elevated Schemas



To examine whether the relationship between self-reported trait anger (STAXI Trait Anger) and the Number of Elevated Schemas was similarly moderated by average induced anger across scenarios, I conducted a moderation analysis to examine whether induced anger moderates the relationship between STAXI Trait Anger and the total number of elevated schemas, controlling for age. The results of this regression analysis appear in Table 6. The model explained 38.5% of the variance in the number of elevated schemas and was significant ($R^2 = 0.385$, $F(4, 165) = 27.43$, $p < 0.001$).

The main effect of STAXI Trait Anger on the number of elevated schemas was statistically significant ($\beta = .47$, $t = 6.84$, $p < .001$). The main effect of induced anger was also statistically significant ($\beta = .67$, $t = 2.75$, $p = .006$), indicating that higher levels of induced anger are associated with an increase in the total number of elevated schemas. Specifically, for every one-point increase in induced anger, the number of elevated schemas increases by approximately 0.67 when trait anger is at its mean level.

The interaction term between STAXI Trait Anger (mean-centered) and induced anger was significant ($\beta = 0.15$, $t = 3.67$ $p < 0.001$). This significant interaction indicates that the relationship between trait anger and the number of elevated schemas is moderated by induced anger, or the effect of trait anger on the number of total elevated schemas becomes stronger as average anger increases. At low levels of average anger (-1 SD), the relationship between trait anger and elevated schemas is positive but much weaker and marginally significant (slope = 0.231, $p = .031$). At high levels of average anger (+1 SD), the relationship between trait anger and elevated schemas is much stronger (slope = 0.71, $p < .001$). Age did not have a significant effect on the number of elevated schemas in this model ($p = .824$).

Table 6

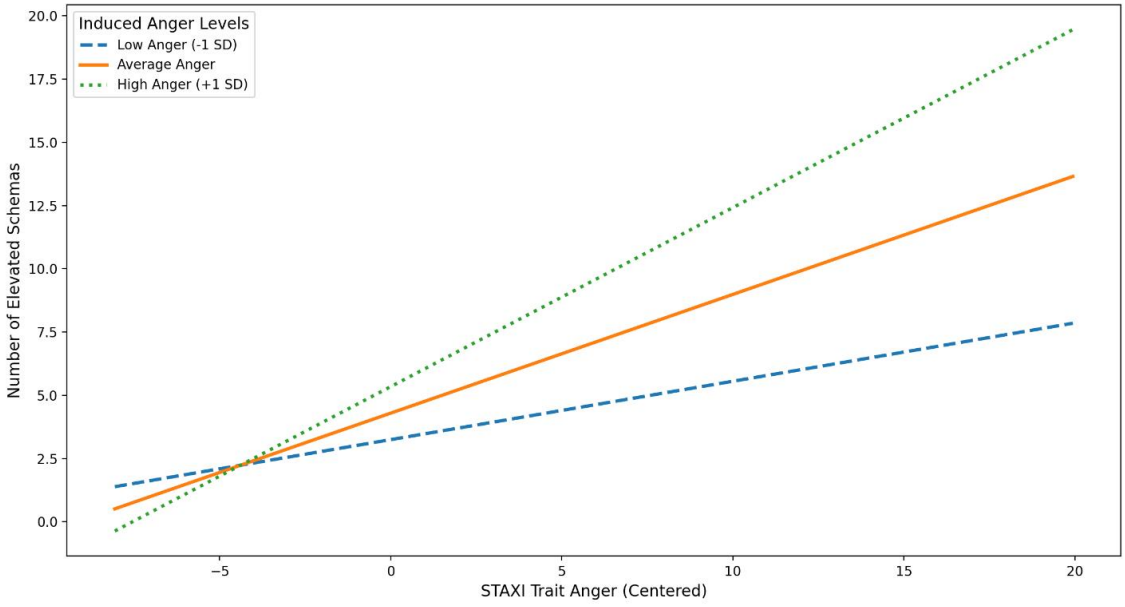
Linear Regression Analysis: STAXI Trait Anger and Induced Anger as Predictors of Number of Elevated Schemas with Interaction Effect

Predictor	B (SE)	t	p
Main Effects			
STAXI Trait Anger	.47 (.07)	6.84	<0.001
Induced Anger	.67 (.24)	2.75	.006
Interaction Effect			
STAXI Trait Anger × Induced Anger	.15	3.67	<0.001
Control Variables			
Age	-.007	-.22	.82
Model Summary: $F(4, 165) = 27.43$, $p < 0.001$, $R^2 = 0.385$			

Note: β = standardized regression coefficient; t = t-statistic; p = p-value

Figure 4

Moderation Effect of Induced Anger on the Relationship between STAXI Trait Anger and Number of Elevated Schemas.



Prevalence and Correlation Analysis of Elevated Schemas

Of the 170 subjects analyzed, 121 (71.18%) had at least one elevated schema. The mean number of elevated schemas per subject was 4.49, while the median was 2, indicating that half had two or fewer elevated schemas. Seventy-five individuals had three or more elevated schemas, which represents 44.12% of the sample.

The most common schema was Self-Sacrifice, elevated in 67 subjects (39.41%), followed by Failure, which was elevated in 59 subjects (34.71%). Unrelenting Standards was the third most common schema, observed in 55 subjects (32.35%). Social Isolation and Negativity were also prevalent, with 48 subjects (28.24%) and 47 subjects (27.65%), respectively. Emotional Deprivation was the least frequently endorsed schema (20 subjects, 11.76%). Other less common schemas included Dependence/Incompetence, Enmeshment, and Punitiveness (Self), each affecting about 17.65% of the sample, and Insufficient Self-Control, present in 18.24% of subjects.

The correlation analysis between the elevated schemas revealed several significant relationships. The strongest correlation was found between Insufficient Self-Control and Dependence/Incompetence, with a correlation coefficient of .74. This was followed by the correlation between Subjugation and Enmeshment, which had a coefficient of .70. Other notable correlations included Insufficient Self-Control and Subjugation (.68), Approval-Seeking and Entitlement (0.68), and Emotional Constriction and Fear of Losing Control (0.66). The average correlation across all schema pairs was .49, indicating a moderate overall relationship between the schemas. The weakest correlation was between Unrelenting Standards and Emotional Deprivation, with a coefficient of 0.18.

LASSO Regression Analysis of Strongly Predictive Early Maladaptive Schemas

LASSO (Least Absolute Shrinkage and Selection Operator) regression analysis was used to identify the most influential maladaptive schemas predicting both STAXI and ADS scores. LASSO regression is a type of linear regression that includes a penalty term to shrink the coefficients of less important variables to zero. This results in a more parsimonious model by effectively selecting a subset of predictors that contribute most to the response variable, and it also helps prevent overfitting, especially in cases where multicollinearity may be an issue (Tibshirani, 1996). Given the high number of early maladaptive schemas identified by the YSQ-R and expected multicollinearity, by applying LASSO, the analysis aimed to enhance model interpretability and prediction accuracy, focusing on the most impactful schemas. The results for each outcome variable are presented below, with standardized coefficients in parentheses.

ADS Total Score

The analysis revealed that Fear of Losing Control ($\beta = 3.08$) was the strongest predictor of total anger dysfunction, followed by Mistrust ($\beta = 1.75$), Punitiveness towards Others ($\beta = 1.65$), Enmeshment ($\beta = 1.17$), and Punitiveness towards Self ($\beta = 0.97$).

ADS Anger-In

Punitiveness towards Others ($\beta = 0.95$) emerged as the strongest predictor of Anger-In scores, followed by Mistrust ($\beta = 0.77$), Fear of Losing Control ($\beta = 0.68$), Social Isolation ($\beta = 0.45$), and Negativity ($\beta = 0.29$).

ADS Vengeance

Enmeshment (β = 1.13) was the most significant predictor of vengeful feelings, followed by Fear of Losing Control (β = 1.01), Punitiveness towards Others (β = 0.84), Approval Seeking (β = 0.78), and Defectiveness (β = 0.59).

ADS Reactivity

Abandonment (β = -1.14) was the most significant predictor of ADS vengeance, followed by Enmeshment (β = 1.13), Fear of Losing Control (β = 0.97), Punitiveness Towards Others (β = 0.86), and Approval Seeking (β = 0.76). Interestingly, the Abandonment schema has the strongest relationship with ADS vengeance scores, but it is a negative relationship, indicating that individuals with higher abandonment schema scores tend to have lower ADS vengeance scores.

STAXI Anger Control

Self-Sacrifice (β = 2.33) emerged as the strongest positive predictor of anger control, while Social Isolation (β = 0.89) was the second strongest predictor. Mistrust (β = -1.623), Negativity (β = -1.70), and Punitiveness (Others) were the strongest negative predictors of anger control, indicating that as these scores decreased, anger control scores were more likely to increase.

STAXI Trait Anger

The Failure schema (β = 1.96) was the most significant predictor of trait anger, followed by Mistrust (β = 1.47), Punitiveness towards Others (β = 1.20), Approval Seeking (β = 1.05), and Fear of Losing Control (β = 0.92).

STAXI Expression

Mistrust (β = 1.87) emerged as the strongest predictor of anger expression, followed closely by Punitiveness towards Others (β = 1.75), Failure (β = 1.19), Approval Seeking (β = 1.09), and Negativity (β = 0.81).

LASSO-Selected Schemas as Predictors of ADS and STAXI Scores

Linear regression analyses were conducted for each outcome variable using the strongest predictors identified by the LASSO model. While LASSO regression excels at identifying key predictors, it does so by imposing a penalty that can bias the estimates of the regression coefficients (Greenwood, 2020). Consequently, to obtain unbiased estimates and a clearer understanding of the relationships between the predictors and the outcome variables, I proceeded with Ordinary Least Squares (OLS) linear regression using the predictors selected by the LASSO model. Again, age and sample group were included as control variables to account for potential confounding effects. The summary of these analyses for ADS scores appears in Table 7, and the summary of these analyses for STAXI scores is in Table 8.

ADS Total Score

The model explained 55.26% of the variance (adjusted $R^2 = 0.553$, $F(6, 163) = 35.79$, $p < .001$). Fear of Losing Control (β = 2.56, t = 2.95, $p = .003$) and Punitiveness Towards Others (β = 1.70, t = 2.27, $p = .024$) were significant predictors, and Mistrust approached significance (β = 1.60, t = 1.93, $p = .055$), Enmeshment (β = 0.89, t = 1.14, $p = .256$), and Punitiveness Towards Self (β = 1.27, t = 1.74, $p = .084$) were not significant. Age was not a significant predictor (β = -0.073, t = -1.30, $p = .194$).

ADS Anger-In

The model explained 42.36% of the variance (adjusted R^2 = .424, $F(6, 163)$ = 21.70, p <.001). Punitiveness Towards Others (β = .91, t = 2.7, p = .007) was a significant predictor. Mistrust (β = .55, t = 1.33, p = .19), Fear of Losing Control (β = .64, t = 1.71, p = .090), Social Isolation (β = .57, t = 1.54, p = .13), and Negativity (β = .18, t = 0.46, p = .64) were not significant. Age was not a significant predictor (β = -.03, t = -1.34, p = .18).

ADS Vengeance

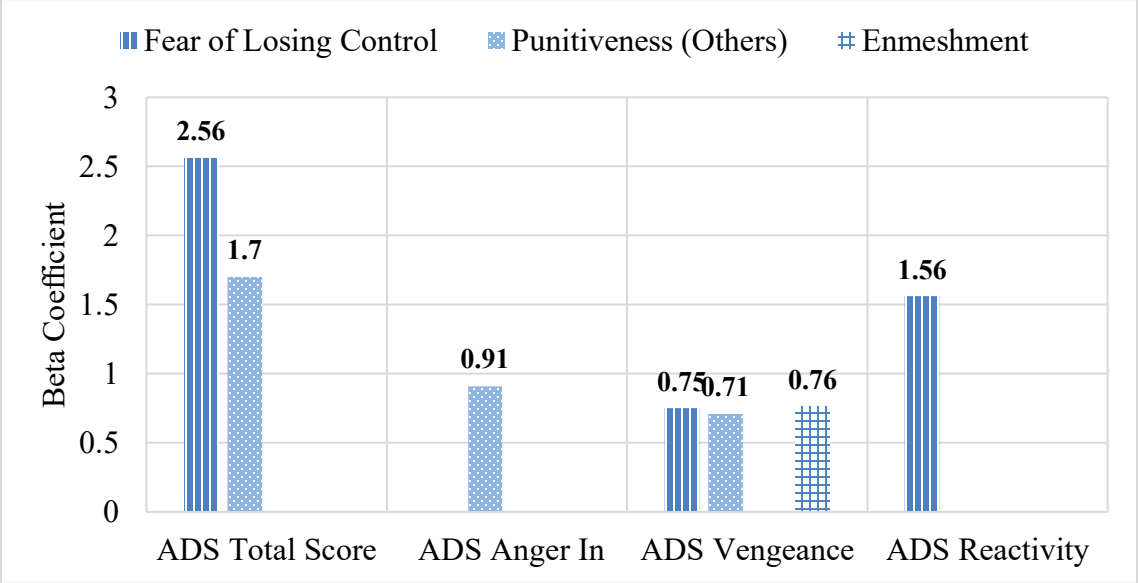
The model explained 50.21% of the variance (adjusted R^2 = .502, $F(6, 163)$ = 29.41, p < .001). Punitiveness Towards Others (β = .71, t = 2.79, p = .006), Enmeshment, (β = .76, t = 2.87, p = .005), and Fear of Losing Control (β = 0.75, t = 2.39, p = .02) were significant predictors. Approval Seeking (β = .004, t = .017, p = .987), and Defectiveness (β = .28, t = 1.07, p = .285) were not significant. Age was not a significant predictor (β = -.01, t = -.46, p = .649).

ADS Reactivity

The model explained 46.1% of the variance (adjusted R^2 = .461, F(6, 163) = 25.06, p < .001). Fear of Losing Control (β = 1.56, t = 3.95, p < .001) was the only significant predictor of ADS reactivity scores. Enmeshment approached significance (β = .70, t = 1.91, p = .059), and Punitiveness Towards Others (β = .33, t =.934, p = .351), Abandonment (β = .061, t = .17, p = .87), and Approval Seeking (β = 0.279, t = .168, p = .866) were all not significant predictors. Age was not a significant predictor (β = -0.05, t = -1.72, p = .09).

Figure 5

Beta Coefficients of Statistically Significant Schemas Predicting ADS Scores



STAXI Anger Control

The model explained 25.9% of the variance ($R^2 = 0.259$, $F(6, 163) = 10.83$, $p < .001$). Self-Sacrifice (β = 2.35, t = 3.72, $p < .001$), Negativity (β = -2.50, t = -2.90, $p = .004$) and Mistrust (β = -2.18, t = -2.45, $p = .015$) were significant predictors of STAXI anger control. Social Isolation approached significance (β = 1.68, t = 1.92 , $p = .056$) and Punitiveness towards Others (β = -1.33, t = -1.73 , $p = .085$) was not significant. Age was not a significant predictor (β = 0.11, t = 1.86, $p = .065$).

STAXI Trait Anger

The model explained 51.44% of the variance ($R^2 = 0.514$, $F(6, 163) = 30.84$, $p < .001$). Mistrust (β = .87, t = 2.13 , $p = .03$), Punitiveness Towards Others (β = 1.17, t = 3.11 , $p = .002$), and Failure (β = .89, t = 3.31 , $p = .001$) were significant predictors of STAXI trait anger. Fear of Losing Control (β = .73, t = 1.66 , $p = .10$) and Approval

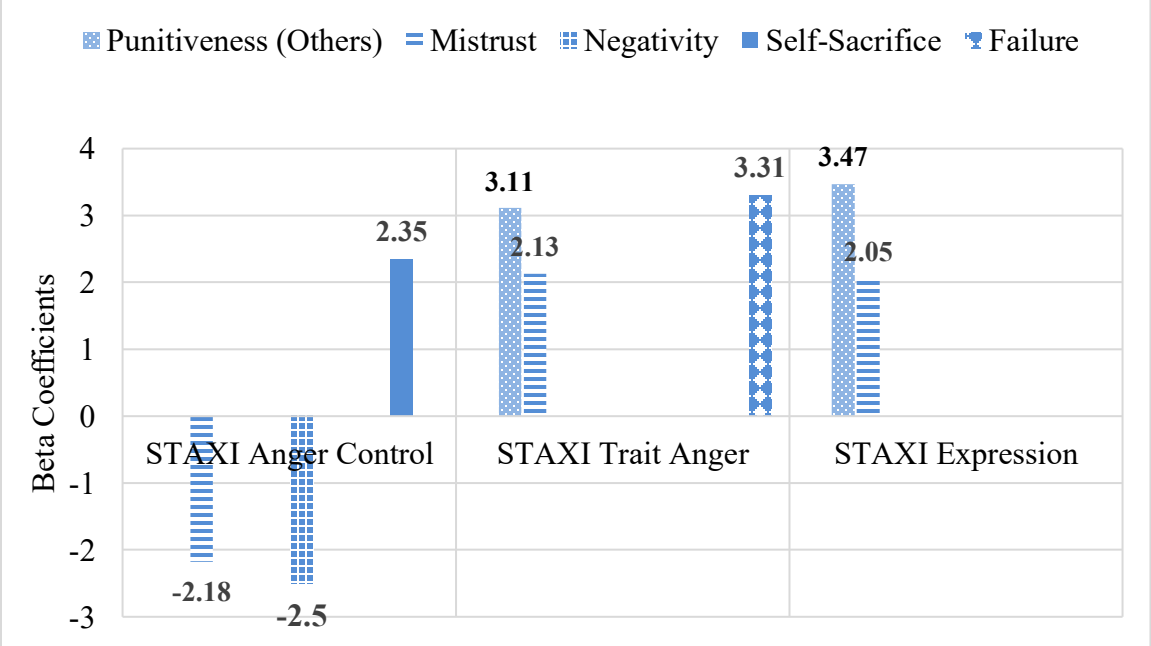
Seeking (β = -.13, t = -.38 , p = .71) were not significant. Age approached significance, but was not a significant predictor (β = -0.055, t = -1.90, p = .059).

STAXI Expression

The model explained 42.03% of the variance (R^2 = 0.420, F(6, 163) = 21.43, p < .001). Mistrust (β = 1.13, t = 2.05 , p = .042) and Punitiveness Towards Others (β = 1.92, t = 3.47 , p < .001) were significant predictors. Failure (β = 0.72, t = 1.74 , p = .084), Approval Seeking (β = .005, t = .010 , p = .99), and Negativity (β = .53, t = .833 , p = .406) were not significant. Age was a significant negative predictor (β = -.10, t = -2.32, p = .021).

Figure 6

Beta Coefficients of Statistically Significant Schemas Predicting STAXI Scores



Moderation Analyses: State Anger's Effect on Relationship Between Anger Variables and LASSO-Identified EMSs

After LASSO regression analyses revealed the specific EMSs most predictive of high ADS Total and STAXI Trait Anger scores, post-hoc moderation analyses were conducted to examine if the relationship between ADS Total and STAXI Trait Anger scores and these strongly predictive schemas was influenced by induced anger. For models with ADS Total Score, Induced Anger, and the interaction effect as predictors, the analyses revealed that all models were statistically significant ($p < .001$), with adjusted R^2 values ranging from .193 (Enmeshment) to .484 (Fear of Losing Control), and the interaction effect was insignificant in all of the models. ADS Total was a significant predictor of every schema ($p < .001$), and induced anger did not reach significance in any models. A summary of these results appear in Table 7.

Table 7

Linear Regression Analyses of Early Maladaptive Schemas with Predictors: ADS Total, Induced Anger, and Interaction Effect

Schema	Predictor	β (SE)	*t*	*p*	Adj. R^2	*F*(4,165)
Fear of Losing Control	ADS Total	.07 (.007)	9.697	<0.001***	.485	40.75
	Induced Anger	.084 (.054)	1.562	0.120		
	Interaction Effect	.008 (.004)	1.704	0.090		
Punitiveness (Others)	ADS Total	.053 (.007)	7.649	<0.001***	.405	29.80
	Induced Anger	.155 (.051)	3.041	0.003**		
	Interaction Effect	-.003 (.004)	-0.611	0.542		
Mistrust	ADS Total	.067 (.007)	9.350	<0.001***	.428	32.57
	Induced Anger	-.049 (.053)	-0.933	0.352		
	Interaction Effect	-.007 (.004)	-0.157	0.876		
Enmeshment	ADS Total	.071 (.008)	9.059	<0.001***	.411	30.44
	Induced Anger	-.051 (.058)	-0.879	0.381		
	Interaction Effect	.001 (.005)	0.229	0.819		
Punitiveness (Self)	ADS Total	.062 (.008)	8.110	<0.001***	.353	24.07
	Induced Anger	-.019 (.056)	-0.330	0.742		
	Interaction Effect	.003(.005)	0.546	0.586		

Note: ADS = Anger Disorders Scale; * p < .05, ** p < .01, *** p < .001, β = standardized regression coefficient; All models control for Age.

For models including STAXI Trait Anger as a predictor, analyses also revealed that the overall models significantly predicted variance for all examined schemas: Failure, Mistrust, Punitiveness (Others), Approval Seeking, and Fear of Losing Control, with R^2 values ranging from .267 (Approval Seeking) to .426 (Fear of Losing Control). STAXI Trait Anger was a significant predictor for all early maladaptive schemas (p <.001), with the strongest effect on Failure and weakest on Punitiveness (Others). The main effect of induced anger was significant for Fear of Losing Control only (p = .042). The interaction term was also only significant for Fear of Losing Control (p = .008), although the interaction term approached significance for Failure (p = .071). A summary of the results can be found in Table 8.

Table 8

Linear Regression Analyses of Early Maladaptive Schemas with Predictors: STAXI Trait Anger, Induced Anger, and Interaction Effect

Schema	Predictor	β (SE)	*t*	*p*	Adj. R^2	*F*(4,165)
Failure	STAXI Trait Anger	.519 (.067)	7.693	<0.001***	.368	25.55
	Induced Anger	.092 (.063)	1.445	0.200		
	Interaction Effect	.116 (.064)	1.820	.071		
Mistrust	STAXI Trait Anger	1.93 (.22)	8.812	<0.001***	.393	28.41
	Induced Anger	-.027 (.062)	-.434	0.665		
	Interaction Effect	.020 (.062)	.315	.753		
Punitiveness (Others)	STAXI Trait Anger	.470 (.067)	7.043	<0.001***	.380	26.92
	Induced Anger	.236 (.063)	3.765	<0.001***		
	Interaction Effect	.023 (.063)	.372	.710		
Approval Seeking	STAXI Trait Anger	.422 (.073)	5.812	0.002**	.267	16.40
	Induced Anger	.079 (.068)	1.162	0.318		
	Interaction Effect	-.003 (.069)	-.044			
Fear of Losing Control	STAXI Trait Anger	.542 (.064)	8.429	<0.001***	.426	32.37
	Induced Anger	.124 (.060)	2.051	.042*		
	Interaction Effect	.162 (.061)	2.666	.008**		

Note: * p < .05, ** p < .01, *** p < .001, β = standardized regression coefficient; All models control for Age.

Articulated Thoughts in Simulated Situations Analysis

A total of 2,431 codes were assigned across the articulated thoughts of all 170 participants, with an average of approximately 14.3 codes per participant, including "Neutral or Misc" codes, and 12.85 codes per participant when considering only codes with substantive content. A brief overview of all codes and an example of associated articulated thoughts appear in Table 9. The complete coding manual is available in Appendix C.

Table 9

Qualitative Codes: Descriptions and Representative Data Excerpts

Code	Brief Description	Sample quote	*n* of transcript excerpts assigned
Behavioral Responses			161
Confrontation	Neutral statements indicating that a respondent wants to "confront" the transgressor	"I would contemplate confronting Robert."	51
Indirect Aggression	Covert attempts to damage/sabotage a person's property/career	I would pretend that there were bugs in the program and sabotage Stacy	13
Passive Aggression	Indirect expressions of hostility (i.e. procrastination, deliberate inefficiency) to avoid direct confrontation	"I'd be inclined to not help any longer"	36
Physical Aggression	Physical force with the intent to harm or intimidate another person	"I could just punch him in the face"	6
Relational Aggression	Damaging someone's social relationships or reputation including discontinuing the relationship	"I'd talk a lot of garbage about him to our family."	42
Verbal Aggression	Using words to harm, insult, or demean another person	"When I see her, I will definitely rip into her."	15
Cognitive Distortions			185
Code of Honor	The belief that one must behave aggressively to maintain their reputation in the presence of a threat	"I will not let someone weaker than me or below me show me up."	1
Hostile Attribution	Interpreting others' behaviors as having hostile intent	"I think she must be trying to make me look bad in front of my other family members."	11
Mind Reading	When a respondent assumes they know what others are thinking without any concrete evidence	"I think everyone is disappointed in me."	20
Overgeneralization	Applying the scenario's events to all other events	"I'll never confide in any family member ever again"	76
Irrational Beliefs			129

Catastrophic Evaluation	An exaggeration of the negative consequences of a situation to an extreme degree	"It is absolute torture to be around people you don't get along with"	13
Demandingness	An unrealistic and absolute expectation of events or individuals being the way a person desires them to be	"People should really be more upfront about things"	67
Frustration Intolerance	A demand for ease and comfort and reflecting an intolerance of discomfort	"This would be too much for me, I would totally lose it."	15
Global Negative Evaluation (GNE)	Broad negative judgments that apply to an entire person rather than focusing on specific actions or attributes	"I think she is a bad person"	78
w/ Inflammatory Labeling	GNE including pejorative or profanity to describe the target of one's anger	"He's a manipulative asshole"	33

Table 9 (Cont.)

Code	Brief Description	Sample quote	*n* of transcript excerpts assigned
Self-Derogatory Labeling	The belief that the self can be rated as entirely worthless	"I'm the loser everyone is talking about"	4
Emotional Responses			
Anger			380
Adaptive		*irritated, disdain, annoying, frustrating*	135
Disturbed		**Anger, rage, mad**	245
Disgust			24
Adaptive		*Antipathy, aversion*	0
Disturbed		**Disgust, repulsion, revulsion**	24
Fear			145
Adaptive		*concerned, unsettled, uneasy*	13
Disturbed		**Fear, anxiety, worried, overwhelmed, stressed, scared**	132
Hurt			61
Adaptive		*Miffed*	0
Disturbed		**Hurt, offended, wounded, indignant**	62
Sadness			191
Adaptive		*sadness, disappointment, let down*	143
Disturbed		**Depression, despair, discouragement, disheartened**	39
Shame			51
Adaptive		*regret, remorse, repentance*	22
Disturbed		**Shame, embarrassment, humiliation**	29
Surprise			67
Adaptive		*amazed, astonished*	0
Disturbed		**Surprised, shocked, in disbelief, alarmed, stunned**	67
Motives			24
Coercion	indications that behaviors are intended to control or force compliance from the target of the anger	"I would make him take on my extra work or I would tell our boss"	0
Experiential Avoidance	indications that behavior has the intention to escape/avoid/distract from emotional experience of anger.	"Part of me would want to skip the get together due to anger and embarrassment"	9
Revenge	a desire to seek revenge, vengeance, or "get back" at the target of anger	"I'm going to tell his worst secret to the groupchat to get even with him."	15
Physiological Arousal	a physical response to emotion	"I can feel my face getting hot"	4
Provocation			387

Betrayal	violations of trust resulting from broken promises or others acting in a harmful or disloyal way	"I trusted him and helped him get this job, and now he's talking badly about me behind my back."	206
Dishonesty	Lying or duplicity is the primary provocation of negative emotionality	"It makes me very upset when people say things that aren't true about me."	12
Disregarded	A perception of subject's opinions/feelings/contributions as being ignored/unseen/ undervalued	"He is so ungrateful, and it makes me feel used"	95
Gossip	An explicit dislike of the act of sharing information about private affairs of others	"I hate work gossip and drama"	63
Powerlessness	situations where individuals feel unable to influence outcomes or assert control.	"I would not feel in control of how my personal information is shared."	5

Table 9 (Cont.)

Code	Brief Description	Sample quote	*n* of transcript excerpts assigned
Negative Coping			109
Self-Blame	Attributing negative outcomes or situations to own actions, decisions, or inherent flaws	"This is my fault for being so naïve"	35
Withdrawal/Avoidance	a desire to retreat from the situation or to avoid dealing with the problem	"I would make an excuse to not go to the family event tonight"	41
Resentment	strong feelings of bitterness or indignation towards the transgressor	"I've broken my back for this company, and this is the thanks I get?"	32
Positive Coping			261
Questioning/ Perspective-Taking	Curiosity about the situation or seeking to understand it from different viewpoints	"I wonder what's going on with him that he's talking like this about me."	59
Adaptive Thinking	Reinterpreting situation from a more balanced perspective or using rational statements	"I am sympathetic to needing to vent , but it's inappropriate in work channels"	111
Problem Solving	Active efforts to address and resolve the issue	"I need to talk to my manager about reducing my workload"	78
Anger Control Statements	Articulated strategies to actively decrease anger	"I need to walk away from the situation to calm down."	16
Neutral or Misc	(1) Emotional/physical content with neutral valence (2) Objective, factual statements about the scenario (3) Statements reflecting responses to non-transgressor(s)	(1) "Confusion, curiosity, calm" (2) "I'm glad my other family members seem supportive" (3) "They are trying to get information I did not provide"	246
Not Enough Info To Code	Statements that do not have neutral emotional valence, but there is not enough content to code further	"I am upset about this exchange."	129

Frequency of Response Type

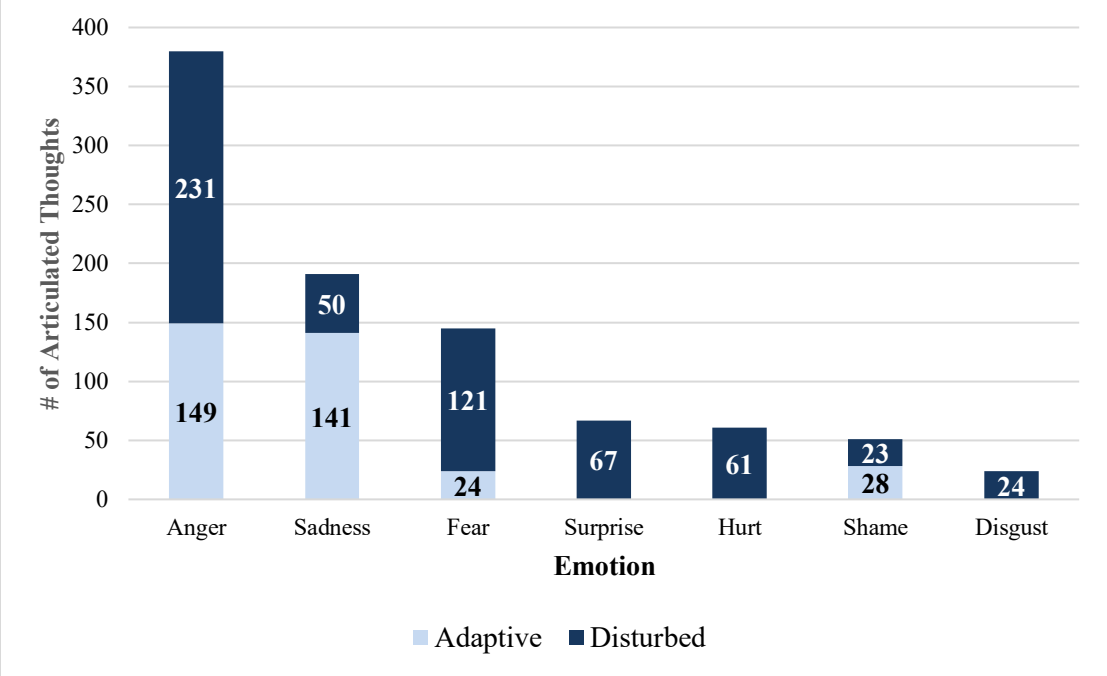
Emotional responses made up a large portion of spontaneously produced responses, accounting for 42.06% (n = 919) of all responses, followed by provocations with 17.1% of all responses (n = 387), then coping strategies (16.9%, Negative Coping: n = 108, Positive Coping: n = 264), followed by cognitive responses (14.5%, Irrational Beliefs: n = 210, other cognitive Distortions: n = 108). Behavioral and aggressive responses (7.43%, n = 163) and motives (1.09%, n = 24) made up a much smaller portion of the total responses.

Emotional Responses. There were a total of 919 emotional responses. Anger was, as predicted, the most frequently coded emotion (n = 380, 41.35% of the category, 17.33% of all responses). Sadness was observed 191 times (20.78% of the category, 8.74% of all responses). Fear was observed 145 times (15.78% of the category, 6.61% of all responses). Surprise was observed 67 times (7.29% of the category, 3.06% of all responses). Hurt was observed 61 times (6.64% of the category, 2.78% of all responses). Shame was observed 51 times (5.55% of the category, 2.33% of all responses). Disgust was observed 24 times (2.61% of the category, 1.09% of all responses). The total number of non-adaptive responses (n = 594) was significantly higher than adaptive responses, $\chi^2(1, N = 907) = 87.06$, $p < .001$. The effect size for this finding, Cramer's V, was .31, indicating a medium effect (Cohen, 1988). Anger had the highest number of both adaptive and non-adaptive responses, with non-adaptive anger being the most frequent emotional response overall. There were significantly more disturbed anger responses than adaptive anger responses, $\chi^2(1, N = 380) = 31.84$, $p < .001$, Cramer's V = .29, more adaptive sadness responses than disturbed sadness responses, $\chi^2(1, N = 182) = 59.43$, $p <$

.001, Cramer's V = .57, and more disturbed fear responses than adaptive fear responses, $\chi^2(1, N = 145) = 97.66$, $p < .001$, Cramer's V = .82. There was no significant difference in the amount of adaptive versus disturbed shame responses, $\chi^2(1, N = 51) = 0.96$, $p = .327$, Cramer's V = .14. Disgust, hurt, and surprise had only disturbed responses, with no adaptive responses recorded. These results appear in Figure 7.

Figure 7

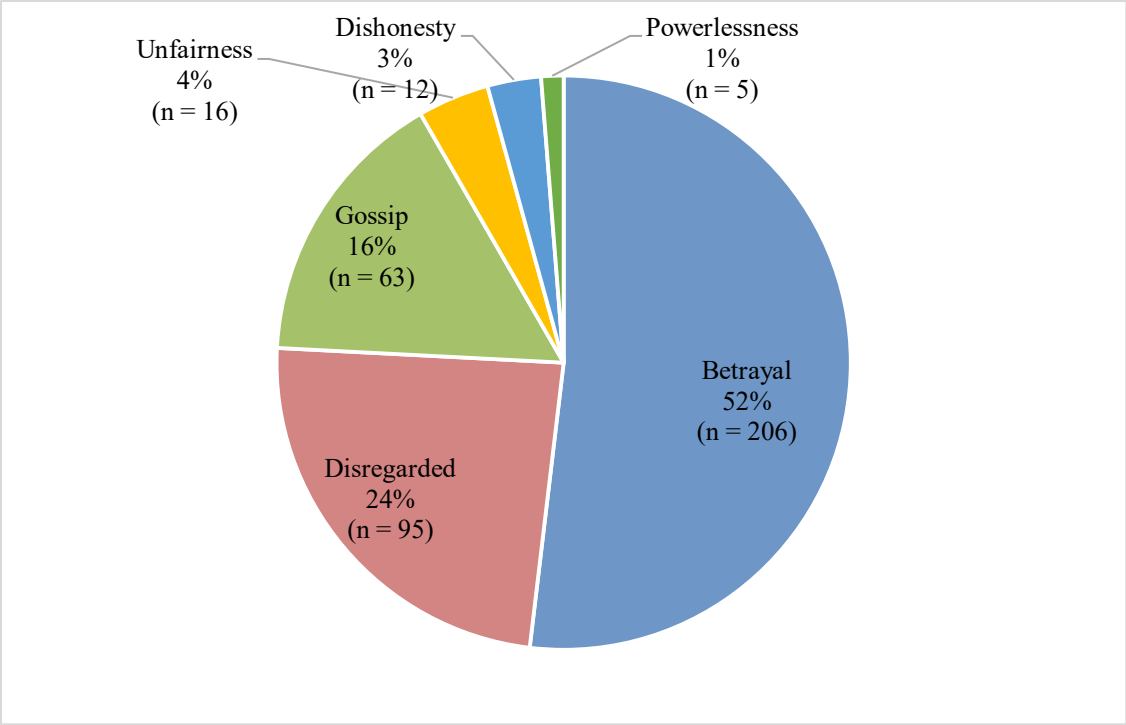
Distribution of Adaptive and Disturbed Articulated Emotional Responses



Provocations. In the Provocation category, there were a total of 397 responses. Betrayal was observed 206 times (51.89% of the category, 9.39% of all responses). Disregarded was observed 95 times (23.93% of the category, 4.33% of all responses). Gossip was observed 63 times (15.87% of the category, 2.87% of all responses). Unfairness was observed 16 times (4.03% of the category, 0.73% of all responses). Dishonesty was observed 12 times (3.02% of the category, 0.55% of all responses). Powerlessness was observed five times (1.26% of the category, 0.23% of all responses).

Figure 8

Distribution of Articulated Provocation Responses



Negative Coping. In the Negative Coping category, there were a total of 109 responses. Withdrawal or Avoidance was observed 41 times (37.61%). Self-blame was observed 35 times (32.11%), and resentment was observed 32 times (29.36%).

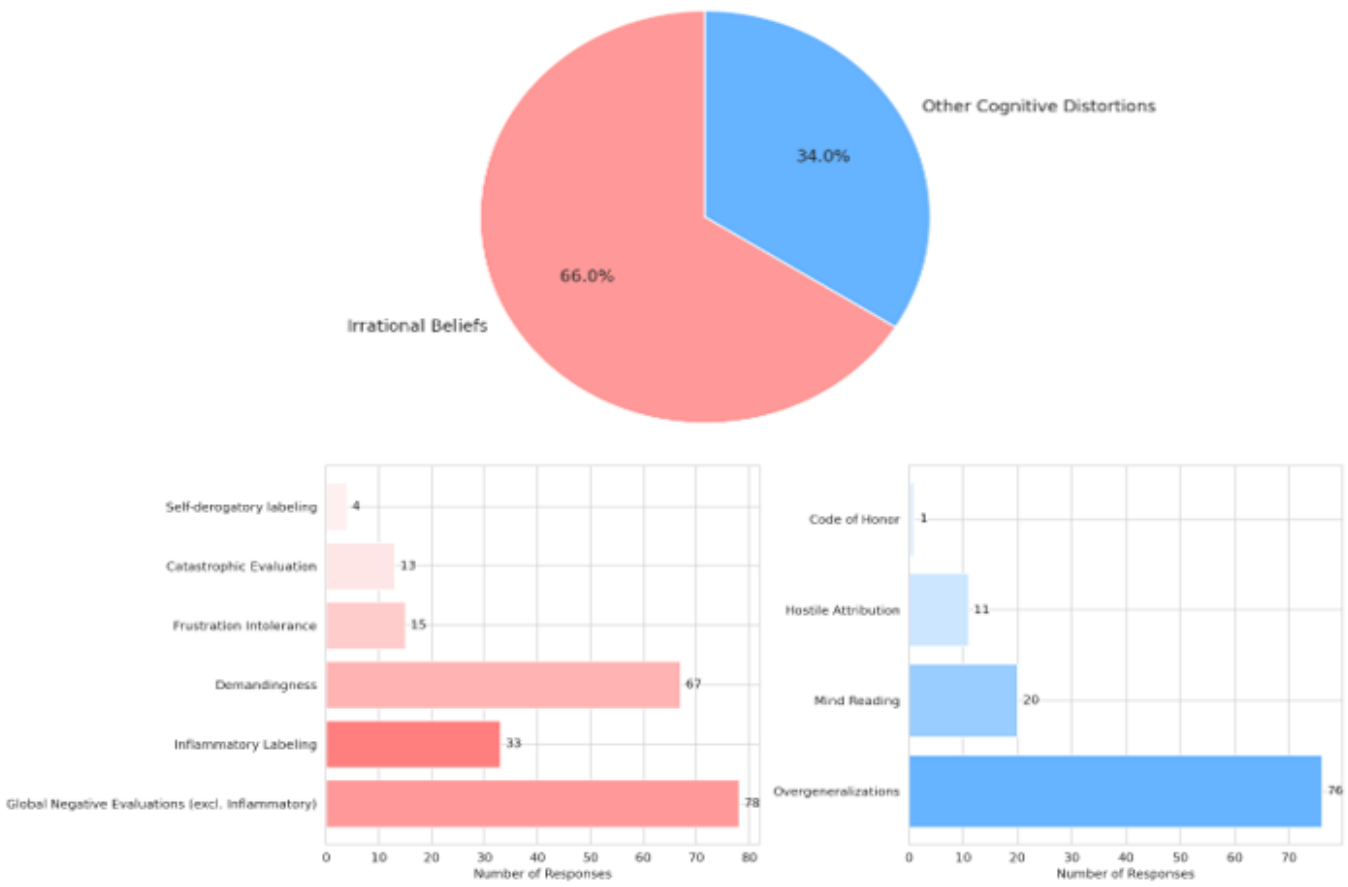
Positive Coping. In the Positive Coping category, there were a total of 261 responses. Adaptive Thinking was observed 111 times (42.53%). Problem-Solving was observed 78 times (29.88%). Questioning or Perspective Taking was observed 59 times (22.61). Anger Control Statements were observed 16 times (6.13%).

Cognitive Responses. In the Irrational Beliefs category, there were a total of 210 responses. Global negative evaluations were the most frequently articulated of

REBT's irrational beliefs, with a total of 111 codes (52.86% of Irrational Beliefs, 34.8% of Cognitive Responses). Thirty-three of these responses included inflammatory labeling (15.7% of Irrational Beliefs, 10.34% of Cognitive Responses); Demandingness was next most common and coded 67 times (31.9% of Irrational Beliefs, 21% of Cognitive Responses). Frustration Intolerance was observed 15 times (11.36% of Irrational Beliefs, 4.7% of Cognitive Responses). Catastrophic Evaluation was observed 13 times (9.85% of Irrational Beliefs, 4.08% of Cognitive Responses). Self-derogatory labeling was observed four times (3.03% of Irrational Beliefs, 1.25% of Cognitive Responses). Other Cognitive Distortions were coded 108 times. Overgeneralizations were observed 76 times (70.37% of other cognitive distortions, 23.8% of Cognitive Responses). Mind Reading was observed 20 times (18.52% of other cognitive distortions, 6.3% of cognitive responses). Hostile Attribution was observed 11 times (10.19% of other cognitive distortions, 3.45% of cognitive responses). Code of Honor was only observed one time.

Figure 9

Distribution of Articulated Cognitive Responses



Behavioral Responses. In the Behavioral Responses category, there were a total of 163 responses. Confrontation was observed 51 times (31.29% of the category, 2.33% of all responses). Relational Aggression was observed 42 times (25.77% of the category, 1.92% of all responses). Passive Aggression was observed 36 times (22.09% of the category, 1.64% of all responses). Verbal Aggression was observed 15 times (9.20% of the category, 0.68% of all responses). Indirect Aggression was observed 13 times (7.98% of the category, 0.59% of all responses). Physical Aggression was observed six times (3.68% of the category, 0.27% of all responses).

Motives. In the Motives category, there were a total of 24 responses. Revenge was observed 15 times (62.50% of the category, 0.68% of all responses). Experiential Avoidance was observed nine times (37.50% of the category, 0.41% of all responses). Coercion was observed zero times.

Response Styles

While coding and analyzing the qualitative data, it became clear that the study prompts elicited two markedly different types of responses from participants. Most subjects (n = 103) provided comprehensive answers encompassing their emotional experiences and underlying cognitive processes. These participants were classified as Cognitive-Emotional (CE) Responders. However, a substantial subset of subjects (n = 67) predominantly offered succinct, single-word emotional responses (ex, “Angry, Sad, Irritated, Anxious, Frustrated”) and were categorized as Emotion-Focused (EF) Responders. This distinction in response patterns necessitated the exclusion of EF

Responders from analyses of cognitive-based responses to maintain the integrity and precision of the results.

From a methodological perspective, including EF Responders in cognitive-based analyses could introduce significant bias and skew the results. EF Responders, by definition, did not engage with the cognitive aspects of the prompts, and their inclusion could dilute the effects observed in Cognitive-Emotional (CE) Responders because the variance introduced by EF Responders' lack of cognitive engagement would likely overshadow the true variance attributable to cognitive processes in CE Responders. By focusing on CE Responders, the analyses maintain a clear focus on cognitive processes, thereby enhancing the validity of the findings. The decision to exclude EF Responders is supported by statistical literature emphasizing the importance of maintaining homogeneity of variance and construct validity in psychological research (Tabachnick & Fidell, 2013). However, this made looking at group differences between CE and EF responders especially important. A summary of group differences appears in Table 10.

Table 10

Summary of Group Differences Between CE and EF Responders

Variable	CE Responders Mean (SD)	EF Responders Mean (SD)	t-statistic	p-value	Cohen's d
ADS Total Score**	32.85 (10.55)	39.33 (13.32)	-3.35	0.001	0.54
ADS Anger In*	14.11 (4.61)	15.97 (4.81)	-2.51	0.013	0.40
ADS Vengeance***	7.55 (3.01)	9.96 (4.85)	-3.62	0.000	0.59
ADS Reactivity**	11.73 (4.50)	14.55 (5.93)	-3.33	0.001	0.54
STAXI Trait Anger**	16.94 (5.28)	19.79 (6.40)	-3.03	0.003	0.49
STAXI Control**	48.41 (10.13)	44.10 (8.88)	2.92	0.004	-0.45
STAXI Expression	31.86 (7.40)	33.71 (8.31)	-1.48	0.142	0.23
YSQR Total*	310.63 (105.61)	357.51 (130.72)	-2.46	0.015	0.39
Total Elevated Schemas*	3.58 (4.77)	5.88 (7.11)	-2.33	0.022	0.38
Average Induced Anger	4.91 (1.54)	4.73 (1.60)	0.72	0.472	-0.11
Baseline Anger	1.84 (1.26)	2.31 (1.74)	-1.90	0.060	0.31
Age***	34.58 (12.72)	27.60 (8.37)	4.32	0.000	-0.65

Note: CE =Cognitive-Emotional: EF = Emotion-Focused
*For p-values less than 0.05; ** For p-values less than 0.01; *** For p-values less than 0.001.

Demographic Group Differences

Demographic analyses revealed significant differences between the two response groups. A chi-square test of independence indicated a statistically significant disparity in sample distribution between CE and EF Responders, $\chi^2(2, N = 138) = 18.08$, $p = .0001$. CE Responders were disproportionately represented in the CloudResearch sample (76.7%) compared to the SONA sample (44.8%), while EF Responders showed a more balanced distribution across the three sample sources. Notably, no significant differences were observed between the groups in gender, sexual orientation, race/ethnicity, or education level. Age emerged as a significant differentiating factor between the two groups. An independent samples t-test revealed that CE Responders ($M = 34.58$, SD = 12.72, n = 103) were significantly older than EF Responders ($M = 27.60$, SD = 8.37, n = 67), $t(167.97) = 4.32$, $p < .001$, $d = -.65$. This moderate to large effect size suggests that this age difference has real-world importance.

ADS-SF Group Differences.

Further analyses focused on anger-related variables, using independent samples t-tests to compare the two groups. The findings consistently indicated that CE Responders scored lower on the ADS than EF Responders. CE Responders (M = 32.85, SD = 10.55) had significantly lower ADS Total scores than EF Responders (M = 39.33, SD = 13.32), $t(118.16) = -3.35$, $p = .001$, d = .54, CE Responders (M = 14.11, SD = 4.61) had significantly lower ADS Anger-In scores than EF Responders (M = 15.97, SD = 4.81), $t(136.84) = -2.51$, $p = .013$, d = 0.40, CE Responders (M = 7.55, SD = 3.01) had significantly lower ADS Vengeance scores compared to EF Responders (M = 9.96, SD = 4.85), $t(99.11) = -3.62$, $p < .001$, d = .59, and CE Responders (M = 11.73, SD = 4.50) had

significantly lower ADS Reactivity scores than EF Responders (M = 14.55, SD = 5.93), $t(114.43) = -3.33$, $p = .001$, d = .54.

STAXI Group Differences.

CE Responders (M = 16.94, SD = 5.28) also reported significantly lower STAXI Trait Anger than EF Responders (M = 19.79, SD = 6.40), $t(121.88) = -3.03$, $p = .003$, d = .49. CE Responders (M = 48.41, SD = 10.13) had significantly higher STAXI Control scores compared to EF Responders (M = 44.10, SD = 8.88), $t(153.76) = 2.92$, $p = .005$, d = -.45. CE Responders (M = 31.86, SD = 7.40) did not have significantly different STAXI Expression scores than EF Responders (M = 33.71, SD = 8.31), $t(129.38) = -1.48$, $p = .071$, d = -.24.

YSQR Group Differences

CE Responders (M = 310.63, SD = 105.61) scored significantly lower than EF Responders (M = 357.51, SD = 130.72), $t(119.95) = -2.46$, $p = .015$, d = .39. Additionally, CE Responders (M = 3.58, SD = 4.77) exhibited significantly fewer total number of elevated schemas as compared to EF Responders (M = 5.88, SD = 7.11), $t(104.52) = -2.33$, $p = .022$, d = .38.

State Anger Group Differences.

No group differences were found between CE and EF responders for either baseline anger, $t(110.16) = -1.90$, $p = .060$, d = -3.19 or induced anger, $t(136.90) = .72$, $p = .472$, d = -.194.

Correlations Between Articulated Irrational Beliefs and Early Maladaptive Schemas

There were 28 significant correlations between irrational beliefs and early maladaptive schemas, with the strongest correlation observed between Catastrophic Evaluation and Enmeshment (r = .319, p = .001). Irrational Beliefs (as a composite measure) showed the highest number of significant correlations with various schemas (n = 10), followed by Catastrophic Evaluation (n = 5) and Frustration Intolerance (n = 5). All significant correlations were positive, ranging from r = 0.196 to r = 0.319. The schemas most frequently associated with irrational beliefs were Enmeshment, Social Isolation, and Fear of Losing Control, each correlating significantly with three different irrational belief measures. Global Negative Evaluation and Self-Derogatory Labeling were not significantly correlated to any of the irrational beliefs or irrational beliefs as a composite score.

Table 11

Correlations Between Articulated Irrational Beliefs and Early Maladaptive Schemas

		Irrational Beliefs					
Early Maladaptive Schemas	Total Irrational Beliefs	SDL	GNE	GNE w/ IL	FI	DEM	CE
Punitiveness Others	.186	.077	.058	.196*	.162	.015	.113
Punitiveness (Self)	.198*	.053	.019	.163	.065	.171	.044
Negativity	.231*	.054	-.065	.183	.127	.185	.294**
Approval Seeking	.152	.026	-.029	.102	.146	.126	.126
Insufficient Self Control	.113	.123	-.133	.041	.146	.186	.148
Entitlement	.257**	.158	.071	.167	.266**	.072	.191
Unrelenting Standards	.150	.100	.150	.103	.056	-.007	.018
Emotional Constriction	.185	.117	-.003	.220*	.108	.052	.164
Fear of Losing Control	.228*	.161	-.068	.181	.218*	.135	.287**
Self-Sacrifice	.143	-.034	.100	.068	.102	.009	.165
Subjugation	.241*	.047	-.147	.145	.255**	.173	.193
Enmeshment	.220*	.066	.008	.071	.199*	.134	.319**
Vulnerability to Harm	.204*	-.033	-.019	.128	.009	.219*	.208*
Dependence/Incompetence	.215*	.174*	-.090	.154	.080	.245*	.178
Failure	.200*	.163*	-.113	.182	.039	.241*	.172
Defectiveness	.173	.178*	-.099	.177	.030	.181	.170
Social Isolation	.221*	.089	-.017	.259**	.132	.071	.241*
Mistrust	.190	.105	-.028	.138	.201*	.122	.159
Abandonment	.209*	.081	-.035	.137	.127	.198*	.153
Emotional Deprivation	.053	.127	-.177	.090	.158	.071	.174

SDL = Self- Derogatory Labeling, GNE = Global Negative Evaluations, IL = Inflammatory Labeling, FI = Frustration Intolerance, DEM = Demandingness, CE = Catastrophic Evaluation

p <.05*

p <.01**

Multiple Linear Regression Analyses: Prediction of ADS, STAXI, and EMSs by Articulated Irrational Beliefs

Multiple regression analyses indicated that age and irrational beliefs were significant predictors of anger-related measures and early maladaptive schemas, consistently showing a negative and positive relationship, respectively, while other

cognitive distortions did not provide significant additional explanatory power in these models.

Specifically, irrational beliefs were a significant predictor for ADS Total Scores ($\beta = 1.41$, $p = .003$, adjusted $R^2 = .12$), ADS Anger-In scores ($\beta = 0.40$, $p = .02$, adjusted $R^2 = .072$), ADS Vengeance scores ($\beta = .40$, $p = .005$, adjusted $R^2 = .073$), ADS Reactivity scores ($\beta = .51$, $p = .02$, adjusted $R^2 = .10$), STAXI Trait Anger ($\beta = 0.62$, $p = .01$, adjusted $R^2 = .142$), and STAXI Expression ($\beta = .83$, $p = .01$, $R^2 = .16$). Irrational beliefs were negatively associated with, but not a significant predictor for STAXI Control ($\beta = -.80$, $p = .088$, $R^2 = .10$). Irrational beliefs were also a significant predictor of YSQR-R scores ($\beta = 12.82$, $p = .009$, $R^2 = .12$), as well as total number of elevated schemas ($\beta = .48$, $p = .03$, adjusted $R^2 = .05$). Articulated Irrational Beliefs did not significantly predict induced anger. However, other cognitive distortions (composite score of Code of Honor, Personalization, Overgeneralization, Mind Reading, Hostile Attribution Bias) significantly predicted induced anger ($\beta = 0.34$, $p = .01$, adjusted $R^2 = .036$). The adjusted R^2 values range from approximately .04 to 0.16, indicating that the models explain a small to moderate amount of variance in the dependent variables and that other unmeasured factors likely influence a substantial portion of the variance in the dependent variables.

Linear Regression Analysis: Prediction of Anger and Schema Variables by Articulated Aggressive Responses

The total number of articulated aggressive responses significantly predicted induced anger ($\beta = 0.36$, $p < .001$, $R^2 = .094$), YSQR Total ($\beta = 22.56$, $p = .002$, $R^2 = .139$), total number of elevated schemas ($\beta = 1.2$, $p < .001$, $R^2 = .123$), and ADS Anger-In ($\beta = 0.73$,

p = .02, R^2 = .073). Total aggressive responses showed a positive association with ADS Total Score, but the relationship did not reach statistical significance (β = 1.37, p = .06, adjusted R^2 = .072). Total aggressive responses were not significant predictors for ADS Reactivity (β = 0.36, p = .250, adjusted R^2 = .056), STAXI Trait Anger (β = 0.49, p = .176, adjusted R^2 = .095), STAXI Expression (β = 0.75, p = .136, adjusted R^2 = .118), ADS Vengeance (β = 0.16, p = .461, adjusted R^2 = .011), or STAXI Control (β = -0.65, p = .354, adjusted R^2 = .066). Age was not a significant predictor of aggressive responses.

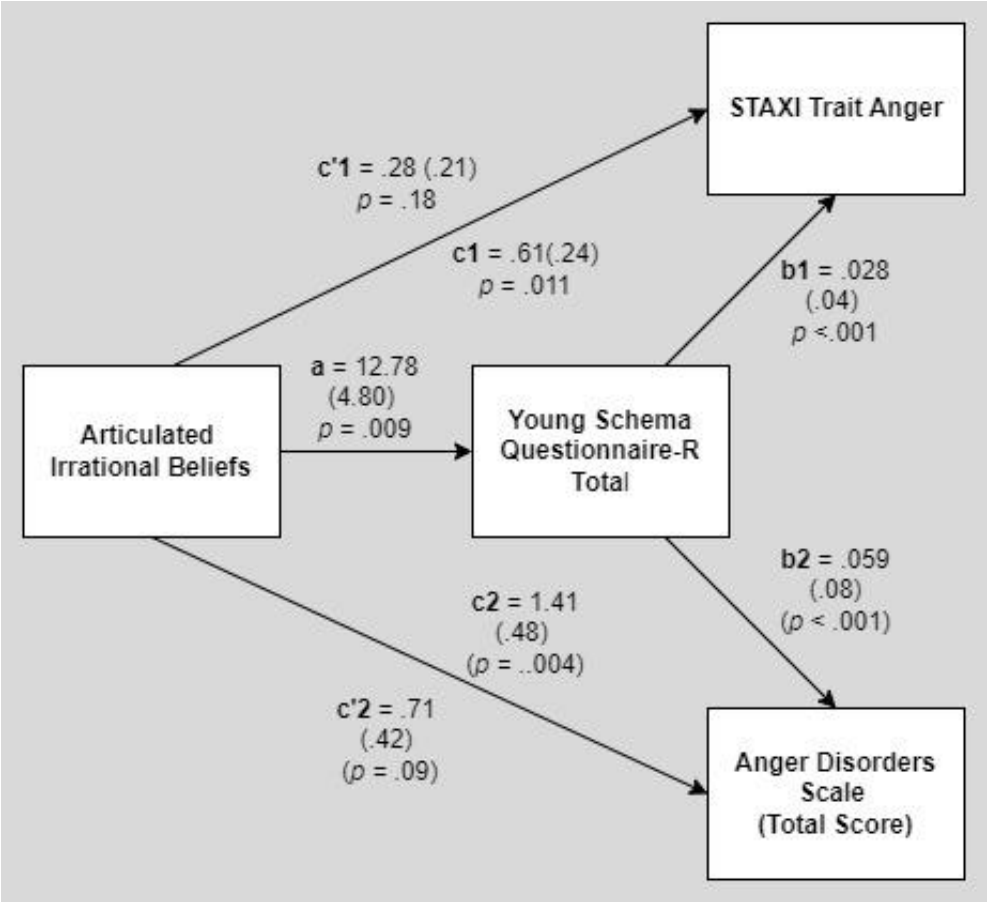
Mediation Analysis: Early Maladaptive Schemas as Mediators Between Irrational Beliefs and Anger Outcomes

To test the hypothesis that early maladaptive schemas mediate the relationship between irrational beliefs and anger, I conducted mediation analyses using YSQ-R Total scores as the mediator and STAXI Trait Anger and ADS Total as outcome variables to see if results differed between individuals with increased trait anger versus general anger dysfunction. Where using the total number of elevated schemas was more meaningful when working with the larger sample, YSQR Total is a more sensitive measure in capturing the relationship between irrational beliefs and anger for a non-clinical population that has lower total numbers of elevated schemas and less variability within the sample. All analyses controlled for age. YSQ-R Total significantly mediated the relationship between irrational beliefs and STAXI trait anger (indirect effect = .34, SE = .14, p = .014). The total effect (c1) of irrational beliefs on trait anger was .61 (SE = 0.24, p = .011), with 54.72% of this effect mediated by YSQR Total. The direct effect (c'1) of irrational beliefs on trait anger, controlling for YSQR Total, was not significant (.28, SE = 0.21, p = .18).

Similar patterns were observed for ADS Total scores. YSQR Total significantly mediated the relationship between irrational beliefs and ADS Total Scores (indirect effect = .71, SE = 0.29, p = .013). The total effect was 1.98 (SE = 0.57, p < .001), with 56.95% of this effect mediated by YSQR Total. The direct effect (c') of irrational beliefs on ADS Total, controlling for YSQR Total, was .70 (SE = 0.48, p = 0.15) was not significant. The total effect (b1) of irrational beliefs on ADS Total was 1.41 (SE = 0.48, p = 0.004).

Figure 10

Mediation Path Diagram: Effects of Irrational Beliefs on Anger Outcomes via YSQR Total



Note: In these mediation models:
a represents the effect of Irrational Beliefs on YSQ-R (Total)
b1 and b2 represent the effects of YSQ-R (Total) on STAXI Trait Anger and ADS (Total), respectively.
c1 and c2 represent the total effects of Irrational Beliefs on STAXI Trait Anger and ADS (Total), respectively
c'1 and c'2 represent the direct effects of Irrational Beliefs on STAXI Trait Anger and ADS
The indirect effects are calculated as ab1 for STAXI Trait Anger and ab2 for ADS (Total)

In a cross-sectional design, where data is collected at a single point in time, there are limitations in establishing causality and the temporal ordering of variables, which is important for mediation. Testing mediation in multiple ways can help address these limitations and strengthen the validity of the findings. To do this, I tested alternative mediational pathways in which the independent variables in my previous models (Irrational Beliefs) became the mediator, and the previous mediator (YSQR Total) became the independent variable, keeping the dependent variables the same.

Results of this alternative model indicated that Irrational Beliefs did not significantly mediate the relationship between YSQR Total and ADS Total (ab = .004, SE = .003, p = 0.15), nor YSQR Total and STAXI Trait Anger (ab=.001, SE = .001, p = .23). The proportion of the total effect mediated for the models was substantially lower than the original model, 6.15% and 5.15% respectively.

Additionally, I employed a bootstrapping approach to test the significance of the indirect effects in the mediation models. Bootstrapping is preferred over traditional methods (like the Sobel test) because it does not assume the normality of the sampling distribution of the indirect effect (Koopman et al., 2014). This approach provides a more robust test of mediation, especially in smaller samples or when dealing with non-normal distributions.

In both original models, where YSQ scores served as the mediator, the 95% confidence intervals did not include zero, indicating statistically significant mediation effects. For ADS Total, the bootstrapped indirect effect was 0.70, 95% CI [0.22, 1.27], and for STAXI Trait Anger, the bootstrapped indirect effect was 0.34, 95% CI [0.10,

0.62]. These results corroborate and strengthen the earlier findings from the Sobel test and increase confidence in the stability and reliability of the mediation effects.

Despite these results, the cross-sectional design of this study limits our ability to establish causal relationships. We can only identify associations between variables, not determine cause and effect. It is possible that irrational beliefs and early maladaptive schemas influence each other reciprocally over time, which cross-sectional data cannot capture. However, this analysis provides preliminary evidence that maladaptive schemas may mediate the relationship between irrational beliefs and trait anger, as well as general anger-related dysfunction. Further longitudinal research is needed to confirm these relationships and rule out alternative explanations.

Moderation Regression Analysis: Early Maladaptive Schemas as Moderator Between Irrational Beliefs and Anger Outcomes

Considering the complex relationship between early maladaptive beliefs, irrational beliefs, and anger dysfunction, moderation analyses were also conducted to capture both the mechanisms through which irrational beliefs influence anger (mediation) and the conditions under which this influence may vary (moderation).

Moderation analyses revealed that YSQR Total did not significantly moderate the relationship between irrational beliefs and ADS Total (β= 0.002, $p = 0.64$), STAXI trait anger (β= -0.0001, $p = 0.96$), or induced anger (β = .001, $p = .292$). However, as expected based on previous analyses, YSQR Total demonstrated significant main effects on ADS Total scores (β= 0.051, $p < 0.001$), STAXI trait anger (β= 0.0265, $p < 0.001$), and induced anger (β = .005, $p = .002$). Age was significantly associated with trait anger (β= -0.0783, $p = 0.025$) but not with ADS Total scores (β= -0.0996, $p = 0.15$) or induced anger (β =

.01, p = .436).These findings suggest that while schema-related beliefs play a significant role in both anger dysfunction and trait anger, they do not alter the strength or direction of the relationship between irrational beliefs and these anger outcomes. Instead, as suggested by the earlier mediation analyses, schema-related beliefs may serve as a mechanism through which irrational beliefs influence anger outcomes.

DISCUSSION

Brief Summary of Findings

This study explored the complex relationship between irrational beliefs, maladaptive schemas, and anger using well-validated quantitative methods and a novel ATSS paradigm to capture both state and trait anger. The study successfully induced anger using remote, text-based scenarios and found that expressed irrational beliefs were significantly associated with higher scores on both the YSQ-R as well as various measures of anger dysfunction as measured by the STAXI and ADS. The strength of these associations was above and beyond those of other cognitive distortions, which did not reach statistical significance. Irrational beliefs were not significantly linked to the level of induced anger in this non-clinical population, indicating that the intensity of anger in provoking scenarios does not necessarily correlate with irrational thinking. Additionally, induced anger moderated the relationship between overall anger dysfunction, trait anger, and YSQ-R scores. However, when focusing on the key schemas most predictive of dysfunctional anger, the moderation effect of induced anger was no longer observed, indicating that these schemas are more stable and less susceptible to temporary emotional states. Mediation analyses further demonstrated that the intensity of early maladaptive schemas, as measured by the YSQ-R, significantly mediated the relationship between irrational beliefs and both trait anger (STAXI Trait Anger) and overall anger dysfunction (ADS Total Score). This suggests that the influence of irrational beliefs on anger is partly explained by the presence of more intense early maladaptive schemas.

This study's methodology aligns with Campbell and Fiske's (1959) seminal work on construct validity and their multitrait-multimethod (MTMM) approach. By employing traditional self-report measures and the novel ATSS paradigm, I could distinguish between method variance and trait variance in assessing anger and related cognitive constructs. The ATSS paradigm was particularly valuable in capturing situation-specific irrational beliefs, helping to differentiate them from more stable early maladaptive schemas. This methodological distinction is crucial, as it addresses Campbell and Fiske's concern about method variance potentially confounding research findings when similar measurement approaches are used for different constructs.

These findings have important implications for cognitive-behavioral interventions, highlighting the need to address both irrational beliefs and maladaptive schemas in therapeutic settings. Additionally, patterns in articulated responses offer insights into how clients may spontaneously describe anger-provoking situations to their clinicians. Future research can expand on these findings by exploring these relationships in clinical populations and examining the long-term effects of targeted interventions.

Demographic Factors and Anger

I found an overall negative association between age and anger-related variables, suggesting a decrease in anger and related dysfunction as individuals progress from young adulthood to later adulthood and middle age. This is consistent with much of the literature, which supports a developmental trajectory of anger that often peaks in adolescence and young adulthood and decreases with the accumulation of life experiences and improved social competencies. (Blanchard-Fields & Coats, 2008; Charles, 2011). As humans age and develop greater psychosocial maturity, they typically

gain better emotional regulation skills and a more nuanced understanding of their anger responses (Phillips et al., 2006). Apart from these demographic differences, however, no significant differences were found across gender, race or ethnicity, sexual orientation, or education levels. Although some studies have found evidence that females experience lower levels of anger than males (Archer, 2004; Bartlett et al., 2018; Chaplin & Aldao, 2013), the prevailing assumption that women are less angry than men is largely unsupported by empirical evidence (Averill, 1983; Fischer & Evars, 2009; Tafrate et al, 2002). Notably, in this study, women reported higher overall levels of induced anger than men, and they were slightly more likely than men to articulate adaptive and disturbed anger in response to the scenarios, but these differences did not reach statistical significance.

However, the findings did reveal gender differences in other mood reactions to the scenarios, with females reporting higher levels of anxiety and sadness in reaction to the scenarios and males reporting slightly higher levels of relaxation. The effect sizes indicate that these differences are especially meaningful for anxiety (Cohen's d = .48). Women are disproportionately diagnosed with anxiety disorders and report more anxiety symptoms than men, so it logically follows that in reaction to a distressing situation, women would endorse more anxiety (McLean et al., 2011; Asher et al., 2017). Research also indicates that men might underreport symptoms of anxiety on self-report measures (Pierce & Kirkpatrick, 1992), either because they are less aware of these symptoms or because they are unwilling to express emotions perceived to be signs of vulnerability (Simon, 2014). If this study included questions about physical symptoms or behaviors associated with anxiety, men could be more inclined to endorse these less obvious but

still suggestive signs that they are experiencing distress. Interestingly, however, when asked to spontaneously produce responses, men were not less likely to report emotions in reaction to the scenarios than women, and that included the emotions of anxiety and sadness. However, they were significantly less likely to report shame or hurt in reaction to the scenarios.

This difference in endorsement could be partly due to variations in how men and women interpret and express emotions. Despite using the same terms—like "anxiety" or "sadness"— the meanings or emotional weight men attach to these words might differ from those of women, which we can directly see in comparing the Likert scale “mood check” results to those qualitative responses. While men recognize these feelings, their interpretation or the import they assign to them varies, and this is especially true for emotions with more gendered expectations.

Group Differences in Anger and Schema Measures

The analysis revealed significant differences in anger and schema-related variables based on the recruitment method used to gather participants. Specifically, individuals recruited via social media displayed significantly higher scores on measures of anger and maladaptive schemas than those recruited through CloudResearch or SONA (a platform for recruiting undergraduate students). This pattern held across all anger and schema variables but not for induced anger.

The elevated anger and schema scores of subjects recruited through social media was expected given recruitment methods and suggests that individuals seeking out resources on public forums and through community resources represent a more dysfunctional or even a clinical population. However, the lack of significant differences

in induced anger across subjects suggests that while baseline characteristics differ by recruitment method, the scenarios used in the study were equally effective at provoking anger across all groups. This also emphasizes the point that anger is inherent to the human experience, and acute anger on its own is not the cause of dysfunction or distress but rather the way individuals perceive, interpret, and react to their anger that influences its impact.

While the inclusion of the social media group enhanced this study by providing valuable data on individuals with moderate to severe anger pathology, in interpreting the data we cannot equate this group to a clinical population. It is important to consider that the self-selection bias inherent in social media recruitment could result in a sample not fully representative of the broader population with anger pathology in clinical settings. Therefore, findings should be interpreted cautiously and considered preliminary insights rather than definitive conclusions. Future research should aim to include clinically diagnosed participants to validate and extend these findings, ensuring a more comprehensive understanding of anger pathology across different contexts.

Effectiveness of Anger Induction

Each of the three scenarios significantly increased subjects' anger levels compared to their baseline. The low p-values suggest that these increases were not due to random chance, confirming the efficacy of the mood induction procedures. Although there were increases in other negative emotions and decreases in positive emotions, the increase in anger was the most significant change, supporting the targeted nature of the anger induction. The study's findings affirm that remote, text-based scenarios using an ATSS paradigm can successfully elicit genuine and intense emotional responses. This can help

increase sample sizes for studies aiming to induce anger and allow researchers to conduct methodologically sound studies at a lower cost and without extensive resources. However, it is important to note that these scenarios were chosen after an extensive pilot study, where they were reliably ranked in the top 10% of 79 different anger-provoking scenarios chosen after a background literature review into triggers for anger. So, while the effectiveness of this approach is promising, it will always rely on the appropriate selection and validation of the anger-inducing stimuli.

The successful implementation of the ATSS paradigm in this study represents a significant methodological advancement. Unlike traditional self-report measures that may conflate trait-like schemas with situation-specific irrational beliefs due to shared method variance (Campbell & Fiske, 1959), the ATSS paradigm captures real-time cognitive responses to specific situations. This distinction is crucial for differentiating between enduring cognitive patterns (schemas) and situation-specific irrational beliefs. The paradigm's effectiveness in eliciting genuine emotional responses while maintaining methodological rigor addresses Campbell and Fiske's concerns about construct validity in psychological measurement.

Predictive Value of Self-Reported Anger Measures

The study's results provide valuable insights into the predictive value of self-reported anger-related traits, behaviors, and overall dysfunction on both baseline and induced anger. As measured by the ADS and STAXI, various aspects of anger were significant predictors of both baseline and induced anger, demonstrating that self-reported anger symptoms can reliably reflect real-life emotional responses to anger-inducing scenarios. This alignment between self-report measures and actual emotional induction

highlights the validity of these scales in capturing ecologically relevant aspects of anger expression and experience, thereby supporting their use in clinical assessments and research settings to predict and understand anger-related outcomes.

Out of all scores, ADS Reactivity explained the highest variance in baseline anger (35.3%), indicating that individuals with high reactivity are more likely to experience anger at baseline. The ADS Reactivity higher-order score includes questions evaluating rumination and physiological arousal. Although it is natural to think of reactivity as being a response to what is directly in front of us, this emphasizes that ADS Reactivity reflects a heightened sensitivity to anger-provoking stimuli, which can lead to individuals sustaining their anger for longer periods, even when external triggers are not present. Notably, the STAXI Expression scale also demonstrated strong predictive power for baseline anger, corroborating the notion that individuals with elevated expression scores are more susceptible to enduring anger responses. ADS Total Score explained a similarly high variance of baseline anger (33.5%), which is unsurprising considering that ADS Reactivity is a component of the overall ADS Total Score.

Overall, while many ADS and STAXI scores remained predictive of average-induced anger across scenarios, they did not account for as much of the variance in scores as for baseline anger. This discrepancy in predictive power between baseline and induced anger suggests that while self-report of trait-like anger characteristics and anger dysfunction strongly influence an individual's general anger disposition, situational factors and the specific nature of anger-inducing stimuli may play a more substantial role in determining the intensity of anger responses to immediate provocations, highlighting the importance contextual influences and other individual differences in shaping

emotional reactions. STAXI Expression explained the most variance (17.6%), highlighting the relative importance of reactivity in response to anger-inducing scenarios, despite this representing only a modest fraction of the total variance. ADS Vengeance, despite being a significant predictor for both baseline and induced anger, was not as robust a predictor as other aspects of anger as indicated by the amount of variance explained in relation to the other scores, especially for induced anger. This is consistent with proposed anger profiles (DiGiuseppe & Tafrate, 2007) that differentiate between vengeful and resentful individuals who experience high levels of physiological arousal and reactivity and those who are motivated by revenge but are not as physiologically aroused or expressive. In qualitative responses, revenge was significantly associated with aggressive behaviors rather than articulated emotional responses. This indicates that while revenge-driven individuals may indeed experience intense emotions, they might not always verbalize or express these feelings explicitly.

The negative relationship between STAXI Anger Control and baseline anger suggests that subjects who reported higher anger control also reported lower levels of baseline anger. This indicates that anger control abilities effectively could manage or reduce the overall level of anger that a person typically experiences. The fact that STAXI Anger Control is not a significant predictor of induced anger suggests that these anger control abilities do not necessarily influence the intensity of anger experienced in response to specific scenarios or provocations. In other words, even those good at controlling their anger in general still feel intense anger in situations explicitly designed to provoke it.

Moderation Effects of Induced Anger

Induced anger moderated the relationship between self-reported anger variables (STAXI Trait Anger and ADS Total score) and endorsed early maladaptive schemas. There were also significant main effects of ADS total score or STAXI trait anger and induced anger in their respective models.

These results highlight the role of state anger in the relationship between trait anger, anger dysfunction, and the endorsement of maladaptive beliefs about the self and others. Although we see a significant relationship between these self-reported measures and early maladaptive schemas, that relationship increases in strength when in a heightened mood state. The mood sensitivity of early maladaptive schemas is an area of research that is beginning to be explored for depression and anxiety, with research essentially concluding that while some schemas are stable independent of mood, others are much more state-dependent (Renner et al., 2012; Wang et al., 2010). My post-hoc moderator analyses after the LASSO regression revealed that Fear of Losing Control and Punitiveness (Others) were most predictive of higher ADS total scores, while Failure, Mistrust, and Punitiveness (Others) were most predictive of STAXI Trait Anger. Where the significant interaction in the broader models implies that induced anger can amplify the endorsement of maladaptive schemas across the board, there were no longer significant interaction effects when these key schemas were replaced in our moderator analyses, revealing that these highly predictive schemas are quite stable and not influenced by the individual's emotional state. The exception was the Fear of Losing Control schema, which significantly increased in the context of acute anger for individuals with high trait anger and approached significance for individuals with high

ADS scores. This aligns with the notion that this schema is particularly sensitive to situations where the individual feels threatened or overwhelmed by their emotional responses. This amplification in the context of heightened anger may occur because the individual is recalling instances of losing control or is actively struggling to manage their anger during a new destabilizing provocation.

While anger-related schemas are generally stable, individuals with high levels of anger dysfunction may experience an escalation in overall psychological distress and unhealthy cognitive beliefs during episodes of acute anger, reflected by the total number of elevated schemas increasing as a consequence of heightened state anger. This intensified state may not reflect their cognitive functioning in more relaxed or neutral emotional states. Thus, the interaction between state anger and underlying schemas could contribute to more intense and potentially maladaptive reactions during anger episodes.

These findings have important implications for therapeutic interventions. First, clinicians can confidently address beliefs related to these highly predictive early maladaptive schemas, even when clients are in a less activated state—an assurance that is particularly valuable given that clients are often present in more relaxed states during therapy. Although some schemas, when tested as individual predictors, did not show significant associations with anger dysfunction, this could be due to limited variability in their scores when measured independently. However, it is crucial to recognize that these schemas likely co-occur and interact. When combined, this cluster of schemas demonstrates a strong predictive relationship with anger dysfunction, highlighting the importance of considering their collective impact in clinical assessment and treatment planning.

Second, acknowledging that acute anger can lead to heightened psychological distress highlights the need to equip clients with strategies for managing their emotional responses in preparation for anger-triggering scenarios. This preparation is crucial, as it is often unrealistic to expect clients to effectively manage their distress amid an acute anger episode. By addressing both the stable schemas and the state-dependent aspects of anger, therapists can help clients develop more adaptive coping mechanisms that mitigate the intensity of their reactions. Regardless, the significant main effects of both specific and overall early maladaptive schemas on anger dysfunction and trait anger support cognitive-based approaches such as cognitive reframing and cognitive defusion, encouraging clients to observe their thoughts and feelings without becoming entangled in them.

Prevalence and Nature of Elevated Schemas

A significant majority of the sample (71.18%) had at least one elevated early maladaptive schema, with the average number of elevated schemas per subject being 4.49. Notably, 44.12% of participants had three or more elevated schemas, highlighting the prevalence of multiple maladaptive cognitive patterns in the sample. The most commonly elevated schemas were Self-Sacrifice (39.41%), Failure (34.71%), and Unrelenting Standards (32.35%). The Self-Sacrifice and Unrelenting Standards scheme often emerge as EMSs that exhibit marginal significance or show no substantial differences between healthy controls and clinical populations (Thimm & Chang, 2022). This observation suggests that these schemas might be prevalent across a wide range of individuals, regardless of clinical status, highlighting their pervasive nature, especially in Western cultures, and potential relevance in non-clinical and clinical contexts. Failure is

not nearly as prevalent. In looking at the questions that comprise the Failure schema, many have to do with the subject's performance at work or school. Given the context of the scenarios they just read, this schema could have been activated or more cognitively available to this sample. Additionally, this sample primarily consisted of participants in their twenties and early thirties, a demographic that research has shown is more likely to rate themselves unfavorably compared to middle-aged individuals (Callan et al., 2015) and tends to have lower and more unstable self-esteem (Meier et al., 2011).

Correlation analysis revealed strong relationships between specific schemas, such as Insufficient Self-Control and Dependence/Incompetence (r = .74), and Subjugation and Enmeshment (r = .70), and many schema scores showed low to moderate correlations. The high prevalence of multiple elevated schemas suggests that interventions may need to target several maladaptive beliefs simultaneously to be effective. Additionally, the strong correlations between specific schemas point to the possibility of underlying cognitive or emotional processes that link these schemas together, which could inform more integrated treatment approaches. Understanding these patterns can also guide future research into developing and maintaining maladaptive schemas, particularly concerning how they interact and co-occur in different individuals.

Key Maladaptive Schemas Predicting Anger Outcomes

LASSO regression analysis was employed to identify the most influential maladaptive schemas predicting various anger-related outcomes measured by the STAXI and ADS. The results emphasized the importance of specific maladaptive schemas in predicting anger outcomes. Fear of Losing Control, Mistrust, and Punitiveness (Others)

emerged as consistent predictors across multiple outcomes, suggesting that these cognitive patterns are central to anger dysfunction.

While several maladaptive schemas emerged as common predictors of various anger-related outcomes, there were notable differences in their roles and strengths. Social Isolation emerged as a predictor for ADS Anger-In and, interestingly, STAXI Anger Control. Enmeshment strongly predicted ADS total scores, ADS vengeance, and ADS reactivity, but not ADS Anger-In. Failure emerged as a top predictor for STAXI Trait Anger and STAXI Expression scores but not for the ADS scores. Punitiveness (Self) was a top predictor for ADS total score, but none of the higher order ADS scores or STAXI scores. Unsurprisingly, STAXI Anger Control had a unique profile, with only the Self-Sacrifice and Social Isolation schemas appearing as strong positive predictors of anger control and expected negative relationships with Mistrust and Punitiveness (others) schemas. The Abandonment schema stood out as a significant negative predictor of ADS Reactivity, indicating that higher scores in this schema are linked to lower reactivity, which contrasts with the general trend of schemas being positive predictors of anger dysfunction.

The LASSO model's ability to highlight critical predictors provided a helpful starting point, but the linear regression analyses offered a more nuanced understanding of which schemas consistently impacted anger-related outcomes when controlling for other variables. These findings suggested that Mistrust and Punitiveness Towards Others retained significance across both STAXI Trait Anger and most ADS outcomes. Addressing these core schemas could lead to more effective anger management strategies, helping clients to better regulate their emotions and reduce maladaptive

behaviors. Additionally, if clinicians encounter difficulty with clients in therapy for anger dysfunction who are having trouble identifying the irrational or core beliefs influencing their anger, introducing and exploring these schemas could facilitate more effective cognitive-emotional processing.

Regarding variability between anger outcome measures, Fear of Losing Control (FOLC) remained significant for ADS Total, ADS Reactivity, and ADS Vengeance but not for STAXI Trait Anger. While STAXI Trait Anger measures one's general predisposition to become angry, it is more focused on the emotional experience of anger rather than the outward expression of anger, which could explain why FOLC falls away as a significant predictor. However, it's for that reason that you would expect FOLC to emerge as a significant predictor of STAXI Expression scores, and it was not even one of the top predictors in the LASSO regression. Despite their conceptual overlap, ADS Reactivity and STAXI Expression may be capturing different aspects of how anger is managed or expressed. ADS Reactivity may be more closely related to impulsive or emotionally charged reactions, where FOLC directly affects the intensity of those responses. In contrast, STAXI Expression might be more reflective of habitual patterns of anger expression that are influenced by deeper, more ingrained schemas like mistrust and punitiveness towards others.

Failure remained a strong positive predictor for STAXI Trait Anger but not for STAXI Expression. The expectation of inevitable failure and inadequacy, which is the crux of the Failure schema, has previously been theorized to contribute to trait anger (Snell et al., 1991; Martin, 2020). Recent research supports this connection, showing that fear of failure can lead to difficulty controlling verbal and physical aggression

(Sukhodolsky et al., 2019). Additionally, individuals who fear failure often treat themselves harshly during perceived failures (Conroy et al., 2002), which could contribute to increased anger and frustration. This anger builds as individuals perceive ongoing failure as a personal injustice, which fuels enduring anger and irritability. Unlike situational aspects of anger such as reactivity or expression, trait anger reflects a deep-seated, consistent anger response that could be, in part, shaped by persistent beliefs of personal inadequacy.

Additionally, Enmeshment emerged as a unique and significant predictor of ADS Vengeance. The Enmeshment relationship with ADS Vengeance has less of a theoretical basis in the existing literature. However, given the psychological underpinnings of vengefulness, I can hypothesize that Enmeshment's influence on ADS Vengeance scores could stem from its impact on emotional boundaries and the intensity with which individuals perceive betrayal and react to interpersonal conflicts. Some early research has demonstrated that higher levels of enmeshment accurately predict increases in externalizing problems in children (Coe et al., 2018). This highlights the need for further research to explore how enmeshment dynamics might contribute to the development and expression of specifically vengeful attitudes and how addressing these subtleties in therapy could help manage and mitigate vengeful responses.

Punitiveness (Others), as the most prevalent schema across anger-related variables, including Anger-In, reflects the inherent demandingness associated with the belief that individuals who commit wrongs should and deserve to be punished. This schema's pervasiveness suggests that even individuals who may show subclinical levels of anger dysfunction, such as those lacking overt aggression, might still hold rigid,

irrational beliefs affecting their anger expression and emotional regulation. For those who have acted out of anger and faced social, professional, or legal consequences, this introduces a broader existential perspective: while it is natural to seek justice and hold others accountable, it is important to recognize that life isn't always fair. Embracing the idea that people are a product of their current circumstances and acknowledging the potential hypocrisy in expecting others to face harsh punishment while possibly avoiding self-reflection or growth can be crucial. Ultimately, focusing on understanding and addressing underlying beliefs rather than assuming the role of judge and executioner can foster healthier emotional regulation and more compassionate self-reflection, promoting a more balanced approach to both self and others.

Finally, the Self-Sacrifice schema was uniquely associated with STAXI anger control, highlighting a potential protective factor for aggression. However, also an area of clinical concern as the items making up this schema speak to an extreme and, at times, personally destructive sense of duty to prioritize others' well-being over your own. A therapist working with a client exhibiting high control over their anger might want to evaluate if there is any level of self-neglect or subsequent impact on their emotional well-being. A significant negative linear relationship between STAXI anger control and the Negativity and Mistrust schemas, where items represent catastrophic evaluation, black-and-white thinking, and suspiciousness, respectively, could reflect the tendency for more rational cognitive framing and balanced emotional responses. For schemas like Social Isolation for ADS Anger-In or Abandonment for ADS Reactivity, which appeared influential in LASSO but not in linear regression, therapists might consider these factors in conjunction with other more dominant schemas. While these schemas may not be the

primary drivers of anger dysfunction, they could still play a role in specific contexts or in combination with other cognitive patterns.

Frequency of Articulated Thoughts

In the qualitative data analysis, emotional responses were the most common, followed by coping strategies and provocations. The smaller proportions for cognitive distortions, aggression, irrational beliefs, and motives suggest that clients are initially more focused on their emotional experiences and coping mechanisms rather than their thought processes or the motivations behind their actions. Although this response pattern was not hypothesized, it is not surprising. Clients often prioritize discussing their immediate emotional reactions and how they managed the situation, either negatively or positively, over their cognitive process. It is often up to the clinician to guide clients to more actively explore cognitive distortions, irrational beliefs, and motivations that underpin their emotional responses and coping strategies. Also, this was a 25-minute study with little compensation, which decreased the likelihood that all subjects would engage deeply with their thought processes or motivations.

With this in mind, the analysis revealed distinct differences between individuals who were more expansive in their thought process in addition to their emotions, or Cognitive-Emotional Responders (CE Responders) versus the Emotion-Focused Responders (EF Responders) across multiple dimensions. CE Responders had lower scores on all anger measures except STAXI Expression, where there were no significant differences, and STAXI Anger Control, where they had higher scores than EF Responders. CE Responders also had lower YSQR and total number of elevated schemas than EF responders. Demographically, CE Responders were significantly older (M =

34.6) compared to EF responders (M = 27.6) and more predominantly from the CloudResearch sample, while EF Responders showed a more balanced distribution across samples and were generally younger. There were no significant differences in baseline or average-induced anger in reaction to the scenarios. So, even though I was limited to analyzing cognitive data for a less dispositionally angry group, they were no less situationally angry than the EF responders. Although the data indicates that individuals who respond succinctly and with primarily emotional responses have more anger dysfunction, it is also important to consider that the CloudResearch sample received monetary compensation for participation and might have been more motivated to provide detailed responses to the free-form questions than the social media and undergraduate groups.

However, the observed differences between EF and CE responders do suggest that angrier individuals may need more extensive prompting and guidance to articulate their associated cognitions when in a therapeutic setting. This additional support could be crucial in helping these clients identify and challenge the underlying thoughts and beliefs that fuel their anger responses. Therapists may need to employ specific techniques, such as guided discovery or Socratic questioning, to assist EF Responders in connecting their emotional experiences with their cognitive processes. Conversely, the lower anger levels and higher control reported by CE Responders highlight the potential influence of thought awareness on anger management. This underscores the importance of fostering metacognitive skills in CBT for anger management, as the ability to recognize and articulate thoughts appears to be associated with better anger control. By emphasizing the development of these cognitive skills, therapists may enhance clients' capacity to regulate

their anger more effectively. These findings suggest that CBT practitioners should assess clients' tendencies towards emotion-focused or cognition-expressing responses early in treatment, tailoring their approach accordingly to maximize therapeutic outcomes in anger management.

Correlations Between Articulated Irrational Beliefs and Early Maladaptive Schemas

The presence of 28 significant positive correlations indicates a substantial overlap between irrational beliefs and early maladaptive schemas, supporting the notion that these cognitive patterns may reinforce each other, stem from similar developmental experiences, or that facets of these measures reflect analogous themes. This finding has important clinical implications, suggesting that therapeutic interventions targeting either irrational beliefs or maladaptive schemas might have positive spillover effects on the other construct. However, it is important to note that while these correlations are significant, they are generally weak to moderate in strength. This indicates that while irrational beliefs and early maladaptive schemas are related, they are distinct concepts, each potentially contributing unique variance to psychological distress and dysfunction.

Catastrophic Evaluation (CE) and Frustration Intolerance (FI) were significantly correlated with a greater number of early maladaptive schemas as compared to the other irrational beliefs (n = 5). For CE, the strongest correlations were with Enmeshment, Negativity, and Fear of Losing Control, followed by Social Isolation and Vulnerability to Harm. These associations suggest that individuals who engage in catastrophic thinking may also be prone to difficulties with interpersonal boundaries, a pervasive sense of negativity, and fears related to losing control. The correlation with Social Isolation indicates that catastrophic thinkers might feel disconnected from others, potentially due

to their heightened perception of threat and harm. This perception may also inflate scores on self-report measures, particularly those involving subjective evaluation of risk or negative outcomes.

FI was significantly correlated with Entitlement and Subjugation, as well as with Fear of Losing Control, Mistrust, and Enmeshment. These correlations suggest that individuals who have difficulty tolerating frustration may also exhibit a sense of entitlement, feeling they deserve more than they receive, and a tendency to feel subjugated, perceiving themselves as being controlled by others. Additionally, the association with Fear of Losing Control indicates that frustration intolerance may be linked to concerns about maintaining personal agency. The correlations with Mistrust and Enmeshment further suggest that these individuals might struggle with trust in relationships and maintaining healthy boundaries, potentially leading to interpersonal difficulties.

Demandingness was most strongly correlated with Dependence/Incompetence, followed by Failure, Vulnerability to Harm, and Abandonment. These associations suggest that individuals who exhibit demandingness may also harbor fears of failure, vulnerability, and abandonment, potentially reflecting a cognitive pattern where high expectations and demands on oneself or others coexist with underlying insecurities and fears.

Inflammatory Labeling (IL) was significantly correlated with Social Isolation and Emotional Constriction. The relationship between IL and social isolation could indicate that harsh, exaggerated labeling contributes to or results from a sense of disconnection from others. The use of inflammatory language might alienate individuals from their

social networks, reinforcing feelings of isolation, or it could be a coping mechanism for dealing with perceived social rejection. The co-occurrence between IL and Emotional Constriction could indicate that the tendency to label experiences or people in an inflammatory manner is associated with a restricted emotional expression. Emotional constriction might serve as a way to manage the intense emotions that accompany inflammatory labeling, or the use of harsh language could serve as a superficial outlet for emotions, allowing individuals to vent frustration or anger without genuinely engaging with or processing their deeper emotional experiences.

Global Negative Evaluation (without IL) and Self-Derogatory Labeling did not correlate significantly with any of the early maladaptive schemas. This is an unexpected finding, especially for Global Negative Evaluations, which, by their definition, are when individuals apply irrational beliefs across multiple situations, pushing them, theoretically, closer to schema beliefs. This finding warrants further investigation and may suggest that these beliefs operate through different cognitive mechanisms or represent more normative irrational beliefs in highly provocative scenarios. It also emphasizes that the majority of the Global Negative Evaluations articulated in the study were focused on individual transgressors (i.e., “Alex is a terrible person”) rather than the world as a whole (i.e., “I can’t trust anyone anymore”). Future research could explore these possibilities by examining the contextual factors that influence these beliefs and their potential role in adaptive versus maladaptive cognitive processes. Understanding these nuances could enhance therapeutic strategies by identifying when these beliefs might contribute to psychological distress and when they might reflect typical cognitive patterns.

The schemas most frequently associated with irrational beliefs: Enmeshment, Social Isolation, and Fear of Losing Control, paint a picture of individuals struggling with interpersonal boundaries, social connections, and a sense of personal agency. This pattern might reflect a core psychological dynamic where irrational beliefs contribute to difficulties navigating social relationships, maintaining a stable sense of self, and accompanying feelings of anger and resentment, which can result in aggressive behavior.

Future research could benefit from longitudinal designs to investigate the causal relationships between these constructs and explore how they develop over time. Additionally, investigating how these cognitive patterns relate to specific psychological disorders could provide valuable insights for targeted therapeutic interventions.

Irrational Beliefs as Predictors of Anger Dysfunction and Elevated Early Maladaptive Schemas

Multiple regression analyses revealed that irrational beliefs were strongly associated with various anger-related and schema-related outcomes for CE responders. Specifically, higher levels of irrational beliefs were positively linked to increased ADS Total Scores, ADS Anger-In, ADS Vengeance, ADS Reactivity, STAXI Trait Anger, and STAXI Expression. Additionally, irrational beliefs were positively associated with overall schema scores and the number of elevated schemas. Although there was a negative association between irrational beliefs and STAXI Anger Control scores, it did not reach significance. Age showed a generally negative relationship with anger-related variables but never reached statistical significance, coming closest for STAXI Trait Anger. The significant models explained a small to moderate amount of the variance, indicating that while irrational beliefs are a significant predictor of anger and maladaptive schemas,

other contributing factors are also present. The decreased sample size could also impact these values due to excluding EF responders to avoid the dilution of effects.

Regression analyses also examined the role of other cognitive distortions in predicting anger and schema-related outcomes, controlling for age and sample differences. While cognitive distortions were positively associated with most anger measures, these associations did not reach statistical significance, suggesting a weaker or less direct relationship than that of irrational beliefs and anger dysfunction. This pattern of findings supports the principles of Rational Emotive Behavior Therapy (REBT), which posits that irrational beliefs are a primary source of emotional distress and maladaptive behaviors, including anger (Ellis, 1962).

Previous studies examining the specific irrational beliefs most strongly predictive of anger dysfunction have indicated that frustration tolerance is the most impactful (Fives et al., 2010; Martin & Dahlen, 2004). However, these studies have gathered data via survey responses where subjects identify their thoughts and experiences by endorsing statements rather than spontaneously producing those statements themselves. Therefore, our results do not necessarily contradict frustration intolerance as an impactful factor in dysfunctional anger. Instead, they indicate that an irrational belief is more challenging to express or identify based solely on articulated thoughts. For instance, the statement "I don't want to work here anymore" can vary significantly in meaning depending on tone, volume, and other physical cues, which were not accessible in this study. However, even in the physical presence of an individual, not everyone with decreased frustration tolerance will provide these cues, especially in therapy settings when anger triggers are often being evoked rather than experienced in front of the therapist. If we consider the

ATSS paradigm as a more accurate reflection or parallel to working with clients who spontaneously report their experiences, this study suggests that therapists are more likely to encounter global negative evaluations and demandingness in the therapeutic environment, where frustration intolerance could require additional strategies or more direct questioning to detect.

Total aggressive responses were significant predictors for several outcomes, including ADS Total Score, Average Induced Anger, YSQR Total, and Total Elevated Schemas, but were not significant for other measures, including ADS Reactivity and STAXI Expression. The significant predictive relationships of aggression with these variables may be tempered by the sample being comprised of lower reactivity CE responders, skewing the findings towards less pronounced relationships. The predominance of passive-aggressive responses among the aggressive responses might explain why we still see the significant relationship between early maladaptive schemas and a measure of total anger dysfunction and induced or state anger, but not of more reactive, outwardly aggressive actions.

Negative coping strategies were found to be significant predictors for most anger and schema-related variables. These included ADS Total Score, ADS Reactivity, ADS Vengeance, STAXI Trait Anger, STAXI Expression, STAXI Control (negative relationship), YSQR Total, Baseline Anger, and Average Induced Anger, with R^2 values indicating that negative coping explains a substantial portion of the variance in these outcomes. Negative coping appears to contribute to anger intensity, expression, and overall schema elevation, suggesting that interventions targeting these coping mechanisms could be effective in managing anger and associated maladaptive schemas.

However, the lack of a significant relationship with the total number of elevated schemas likely implies that while this sample demonstrates an overall pattern towards negative coping predicting the endorsement of beliefs associated with early maladaptive schemas, our sample is not comprised of enough variability to show that this difference in coping results in a meaningful difference in actual number of elevated schemas that one would qualify for. Future research, especially with a more clinical population, should examine additional predictors and mechanisms to better understand schema-related outcomes and how they interact with negative coping strategies.

As previously discussed, the ATSS paradigm's ability to capture situation-specific irrational beliefs represents a key methodological strength of this study. By having participants articulate their thoughts in response to specific scenarios, we could better differentiate between immediate irrational beliefs and more enduring schemas. The real-time nature of the ATSS responses helps ensure that we are measuring situation-specific cognitive responses rather than general response tendencies that might be captured by traditional self-report measures.

Early Maladaptive Schemas Mediate the Relationship between Irrational Beliefs and Anger

When measured by YSQR Total, early maladaptive schemas acted as a significant mediator between irrational beliefs and anger dysfunction (ADS Total) and trait anger (STAXI trait anger). This mediation effect was robust, accounting for nearly half of the total effect on trait anger and over half of the effect on general anger dysfunction.

EMS's role as a mediator between irrational beliefs and these measures of dysfunctional anger suggests that irrational beliefs influence anger through their impact

on schemas. In other words, irrational beliefs may lead to the development or reinforcement of certain maladaptive schemas, which in turn contributes to higher levels of trait anger and overall anger dysfunction. This implies that schemas are a crucial mechanism through which irrational beliefs affect anger and its related dysfunction.

The study also revealed an absence of moderation effects, indicating that the strength or direction of the relationship between irrational beliefs and anger does not depend on the level or presence of schemas. In this case, schemas are not altering or interacting with the relationship between irrational beliefs and trait anger but are instead part of the pathway that links the two. While the conditions under which irrational beliefs influence anger did not significantly vary with YSQR Total, both these variables were significant predictors of anger measures on their own.

Limitations

A significant limitation of this study is the sample size, particularly for analyses restricted to the subset of CE responders. While the findings are promising, the sample size may be insufficient to fully capture the complexity of the relationships between variables, especially in moderation and mediation analyses. Additionally, the use of convenience sampling limits the generalizability of the results. The sample does not represent a clinical population, and while the observed relationships may hold for individuals with normative levels of anger, these relationships could differ in a more disordered sample.

It is also striking that even when prompted to articulate thoughts and emotions, such a large proportion of the sample responded with one-word answers. This prompt, derived from previous ATSS studies, may require modification for virtual settings to

enhance the likelihood of participants offering more detailed content for analysis. Instead of asking subjects to articulate their “thoughts and emotions”, this prompt could be adapted to, “Please share your thoughts and emotions, and explain the specific aspects of the scenario that influence your feelings” to encourage more detailed responses. This observation is closely tied to another limitation: the duration of the study. On average, participants took approximately 25 minutes to complete the study, which exceeds the recommended length for maximizing sample size. It is plausible that the "emotion-focused" participants who provided one-word answers were not necessarily more emotionally focused, but rather exhibited a lower frustration tolerance and a heightened desire to complete the study as quickly as possible. Either way, the qualitative data analysis focused on irrational beliefs and cognitive distortions of a smaller sample subset with lower overall anger. The results should be considered preliminary and replicated in a larger general and clinical population.

Methodologically, while using remote, text-based scenarios for anger induction is innovative, it may not fully capture the complexity of real-world anger experiences, and it limits what the researcher can observe in addition to self-report, for instance, changes in heart rate, sweat conductance, or other signs of physical discomfort. Although we live in an increasingly technology-based society, these concerns become particularly relevant for an older sample whose lack of familiarity with a group family chat or work instant messaging system could severely impact their emotional reaction to the scenarios. While most subjects rated their anger as rising between a range we could classify as fairly strongly or quite strongly (4.5-5.15 out of 7), in-person or multimedia scenarios could elevate that number more reliably and increase the ecological validity of the results.

Another limitation is that this study did not account for several potentially influential variables, such as socioeconomic status and trauma history. Individuals from lower SES backgrounds often face more daily stressors and have fewer resources for anger management, potentially leading to higher levels of anger or different patterns of maladaptive schemas. Further, including measures of trauma history, such as the Adverse Childhood Experiences (ACE) questionnaire, could provide valuable insights into how past experiences shape current anger responses and beliefs and increase the level of variance explained in our models. These factors could significantly impact the relationships observed and should be considered in future research.

Finally, while this study's multimethod approach helped address some of Campbell and Fiske's (1959) concerns about method variance, future research could benefit from an even more comprehensive MTMM analysis. Including additional methods of assessment, such as behavioral observations or physiological measures, could further strengthen our ability to differentiate between construct-relevant variance and method-specific variance.

Conclusion

When working with clients who struggle with any distressing affective experience, the challenge is addressing the immediate emotion and understanding the deeper cognitive patterns fueling it. This study sheds light on the intricate relationship between irrational beliefs, maladaptive schemas, and the experience of anger, offering insights for therapeutic practice and directions for future research.

My findings suggest that situation-specific irrational beliefs and more deeply rooted early maladaptive schemas significantly influence anger outcomes. By integrating techniques targeting EMSs with traditional rational-emotive and cognitive-behavioral

approaches, therapists can address both the irrational beliefs and the foundational schemas that contribute to emotional dysregulation. Although schema therapy has its own set of specific techniques, such as imagery rescripting and chair work, therapists can target early maladaptive schemas in many ways, tailoring the approach to the client's unique anger and schema profile as well as their preferential form of treatment. For instance, a study of patients diagnosed with major depression treated with psychodynamic approaches showed successful decreases in EMSs in three of five schema modes (Wegener et al., 2013). The chair work described in schema therapy, where clients take on the role of the punitive parent, shares similarities with inner critic work and defusion techniques described by Acceptance and Commitment Therapy (ACT), which relates to the "Protector" part in Internal Family Systems (IFS). What matters is not the specific approach but bringing awareness to the layers of distorted beliefs that underlie the client's current level of dysfunction.

In summary, this study has made advances in understanding the complicated relationship between irrational beliefs, maladaptive schemas, and anger. The findings highlight the crucial role that both irrational beliefs and maladaptive schemas play in anger dysfunction, with maladaptive schemas mediating the relationship between irrational beliefs and anger-related outcomes. The study identified specific schemas, principally Fear of Losing Control, Mistrust, and Punitiveness (Others), as consistent predictors of different anger outcomes. In addition, results indicating that induced anger moderates the relationship between self-reported anger and endorsed maladaptive schemas challenge previous assumptions about the static nature of schemas and suggest that heightening anger in a controlled and safe therapeutic environment could have

important implications on the thoughts that clients endorse and are therefore targeted by the therapist. These insights suggest that an integrated approach combining techniques targeting early maladaptive schemas with traditional rational-emotive and cognitive-behavioral interventions and even exposure could enhance the effectiveness of anger management treatments. As we move forward, this research paves the way for more nuanced and tailored therapeutic strategies to address emotional dysregulation and anger-related issues, with the aim of lasting and meaningful change.

APPENDIX A

Online Administrated Study Via Qualtrics: "Thoughts and Feelings in Social Situations"

Informed Consent

You have been invited to participate in a research study to learn more about our feelings and thoughts in different social situations. This study is conducted by Kate Romero, MA, a current doctoral student in the Psychology Department at St. John's University. IRB FY2023-176.

If you agree to be in this study, you will be asked to do the following: Complete a questionnaire about your background (age, gender, education, etc.) as well as several other questionnaires about your experience of certain emotions and thoughts you have about yourself. Then, you will be asked to imagine yourself in three different social situations and provide information about your thoughts and feelings in those situations.

Participation in this study will involve about 20-35 minutes of your time. There are no known risks associated with your participation in this research beyond those of everyday life, and your participation may help the researcher better understand how individuals experience emotions. Confidentiality of your research records will be strictly maintained by keeping the information you provide anonymous and restricting access to information to the principal investigator. Participation in this study is voluntary. You may refuse to participate or withdraw at any time without penalty. You have the right to skip or not answer any questions you prefer not to answer.

If there is anything about the study or your participation that is unclear or that you do not understand, or if you have questions or wish to report a research-related problem, you may contact Kate Romero directly at katharine.romero19a@stjohns.edu. For questions about your rights as a research participant, you may contact the University's Human Subjects Review Board, St. John's University, 718-990-1440. You can print a copy of this consent form for your records.

Do you accept the terms and conditions of this study?

- ○ Yes, I consent to participate. (1)
- ○ No, I do not consent to participate. (2)

Are you at least 18 years old?

- ○ Yes (1)
- ○ No (2)

DEMOGRAPHICS

How old are you?

_____

What gender do you identify with?

- ○ Male (Cisgender Male) (1)
- ○ Female (Cisgender Female) (2)
- ○ Transgender Male (3)
- ○ Transgender Female (4)
- ○ Gender Fluid (6)
- ○ Nonbinary (8)
- ○ Other (5) _____
- ○ Decline to state (7)

What is your sexual orientation?

- ○ Heterosexual (1)
- ○ Homosexual (2)
- ○ Bisexual (3)
- ○ Other (4) _____
- ○ Decline to state (5)

What is your race/ethnicity?

- ○ White (1)
- ○ Black (2)
- ○ African Heritage (11)
- ○ Caribbean African Heritage (12)
- ○ South Asian (3)
- ○ East Asian (4)
- ○ Hispanic (5)
- ○ Native American/American Indian (6)
- ○ First Nation/Alaskan Native (9)
- ○ Pacific Islander (7)
- ○ Mixed race (10) _____
- ○ Other (8) _____

What is your level of education

- ○ No High School (8)
- ○ Some High School (1)
- ○ GED (7)
- ○ High School Diploma (2)
- ○ Some College (3)
- ○ Junior College or Associate's Degree (9)
- ○ College Degree, Bachelor's (4)
- ○ Master's Degree (5)
- ○ Doctoral, Law, or Professional Degree (6)

*What country do you live in?

▼(Drop down menu with list of countries)

What state/province do you live in?

_____

English Are you fluent in English?

- ○ Yes (1)
- ○ No (2)

ANGER DISORDERS SCALE – SHORT FORM

ADS-SF Instructions
For each statement below, select the response that best describes you.

1) My anger has been a problem for me…

- ○ a week or less or not at all (1)
- ○ a month or less (2)
- ○ about three months (3)
- ○ about six months (4)
- ○ a year or more (5)

2) I have been so angry that I became aware of my heart racing…

- ○ never or rarely (1)
- ○ about once a month (2)
- ○ about once a week (3)
- ○ about several times a week (4)
- ○ almost every day (5)

3) I use my anger to control others…

- ○ never (1)
- ○ rarely (2)
- ○ occasionally (3)
- ○ often (4)
- ○ always (5)

---

4) When I get angry, I yell or scream at people…

○ never or rarely (1)

○ about once a month (2)

○ about once a week (3)

○ about several times a week (4)

○ almost every day (5)

5) When I feel angry, I boil inside, do not show it, and keep things in…

○ never or rarely (1)

○ about once a month (2)

○ about once a week (3)

○ about several times a week (4)

○ almost every day (5)

6) I get frustrated and angry about…

○ almost nothing (1)

○ only one thing in my life (2)

○ several things in my life (3)

○ many things (4)

○ almost everything (5)

7) When I get upset with people, I push or shove them around…

○ never or rarely (1)

○ about once a month (2)

○ about once a week (3)

○ about several times a week (4)

○ almost every day (5)

8) I get angry if someone makes me look bad in front of others…

○ never (1)

○ rarely (2)

○ occasionally (3)

○ often (4)

○ always (5)

9) When I get angry about something, I cannot get it out of my mind…

○ never or rarely (1)

○ about once a month (2)

○ about once a week (3)

○ about several times a week (4)

○ almost every day (5)

10) Even though I do not show it, my anger usually continues for…

○ only a few minutes (1)

○ a few hours (2)

○ several days (3)

○ about a week (4)

○ a month or more (5)

11) I feel bitter and think that I have had more bad breaks than others…

○ never (1)

○ rarely (2)

○ occasionally (3)

○ often (4)

○ always (5)

12) I believe that if you let people get close to you they will let you down or hurt you…

- ○ never (1)
- ○ rarely (2)
- ○ occasionally (3)
- ○ often (4)
- ○ always (5)

13) When I feel angry, I just want to make the tension go away…

- ○ not at all (1)
- ○ some of the time (2)
- ○ about half of the time (3)
- ○ most of the time (4)
- ○ every time (5)

14) When I get angry with someone, I refuse to do the things that he or she expects of me…

- ○ never or rarely (1)
- ○ about once a month (2)
- ○ about once a week (3)
- ○ about several times a week (4)
- ○ almost every day (5)

15) When I am angry with someone, I have tried to find ways to make that person fail without them knowing I did it…

- ○ Never (1)
- ○ once in my life (2)
- ○ several times in my life (3)
- ○ many times in my life (4)
- ○ every time I am angry with someone (5)

---

16) When I am angry with somebody, I try to stop others from hanging out with that person…

- ○ never or rarely (1)
- ○ about once a month (2)
- ○ about once a week (3)
- ○ about several times a week (4)
- ○ almost every day (5)

17) When I feel anger toward somebody, I want to get revenge on that person…

- ○ not at all (1)
- ○ some of the time (2)
- ○ about half of the time (3)
- ○ most of the time (4)
- ○ every time (5)

STATE-TRAIT ANGER EXPRESSION INVENTORY

STAXI Instructions
Read each of the following statements that people have used to describe themselves and then choose the appropriate option to indicate how you generally feel or react. There is no right or wrong answer. Do not spend too much time on any one statement. Match the answer that best describes how you generally feel or react.

---

1) Am quick tempered

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

2) Have a fiery temper

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

3) Am a hotheaded person

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

4) Get angry when slowed down by others mistakes

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

5) Feel annoyed when not given recognition for doing good work

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

6) Fly off the handle

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

7) Say nasty things when mad

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

8) Furious when criticized in front of others

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

9) Feel like hitting someone when frustrated

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

10) Feel infuriated when do good job and get poor evaluation

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

11) Control temper

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

12) Express anger

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

13) Take a deep breath and relax

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

14) Keep things in

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

15) Am patient with others

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

16) If someone is annoying, apt to tell him or her

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

17) Try to calm down as soon as possible

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

18) Pout or sulk

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

19) Control urge to express angry feelings

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

20) Lose temper

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

21) Try to simmer down

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

22) Withdraw from people

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

23) Keep cool

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

24) Make sarcastic remarks to others

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

25) Try to soothe angry feelings

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

26) Boil inside, but don't show it

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

27) Control behavior

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

28) Do things like slam doors

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

29) Endeavor to become calm again

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

30) Tend to harbor grudges that don't tell anyone about

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

31) Can stop from losing temper

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

32) Argue with others

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

33) Reduce anger as soon as possible

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

34) Am secretly quite critical of others

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

35) Try to be tolerant and understanding

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

36) Strike out at whatever is infuriating

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

---

37) Do something relaxing to calm down

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

38) Am angrier than willing to admit

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

39) Control my angry feelings

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

40) Say nasty things

- ○ Almost Never (1)
- ○ Sometimes (2)
- ○ Often (3)
- ○ Almost Always (4)

41) Try to relax

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

42) Irritated a great deal more than people are aware of

- Almost Never (1)
- Sometimes (2)
- Often (3)
- Almost Always (4)

Mood Baseline Block

Please indicate the level of each mood you are currently feeling.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How relaxed do you feel right now? (1)	○	○	○	○	○	○	○
How frightened do you feel right now? (2)	○	○	○	○	○	○	○
How happy do you feel right now? (3)	○	○	○	○	○	○	○
How angry do you feel right now? (4)	○	○	○	○	○	○	○
How anxious do you feel right now? (5)	○	○	○	○	○	○	○
How sad do you feel right now? (6)	○	○	○	○	○	○	○

ARTICULATED THOUGHTS IN SIMULATED SITUATIONS (VIGNETTE SECTION INTRODUCTION)

Vignette Instruction Most people have a constant stream of thoughts and feelings about what is happening around them.

You will be asked to imagine yourself in **three** different social situations and read accompanying text conversations between other people, imagining they are talking about you. You will be provided information about the situation to help you clearly picture how you would react. After reading each conversation, you will answer questions about how you feel about the situation. Then, you will be asked to list whatever is going through your mind, focusing on your thoughts and emotions. Please do not censor yourself and be as detailed and honest as possible.

Pronouns For the purposes of this study, what pronouns do you prefer?

- ○ She/Her (1)
- ○ He/Him (2)
- ○ They/Them (3)

Stacy and Dave

Work obligations have been at an all-time high recently, and you have consistently been working longer hours than usual for the past few weeks. You find yourself sacrificing personal time, missing meals at home, and last week, you even had to bail on your best friend's birthday dinner to meet a big deadline. You've noticed your colleagues aren't being given nearly as many tasks as you, but when you've asked for their help, they've told you that they are too busy to assist. Your colleague, Stacy, calls you over to her desk one day because she needs help installing a program on her computer. As you're sitting at her desk, she gets a phone call and excuses herself from the room but says you are welcome to get started. When you turn her computer on you see a work chat application up and a conversation between Stacy and another colleague, Dave.

Please indicate the level of each mood you are currently feeling.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How relaxed do you feel right now?	○	○	○	○	○	○	○
How frightened do you feel right now?	○	○	○	○	○	○	○
How happy do you feel right now?	○	○	○	○	○	○	○
How angry do you feel right now?	○	○	○	○	○	○	○
How anxious do you feel right now?	○	○	○	○	○	○	○
How sad do you feel right now?	○	○	○	○	○	○	○

Do your best to list all thoughts and emotions that occurred to you during and in response to reading this exchange. Please list at least 5 separate thoughts.

_____

_____

_____

_____

Robert

You recently helped a family member, Robert, get a new job through your connections at work. Although you are not required to interact with Robert directly, you now work with some of the same colleagues and report to the same manager. You have gone out of your way to make sure that Robert is comfortable in his new job, answering his questions about difficult tasks, training him on different procedures, and making sure that others include him when they go out for lunch and after-work activities.

After a few months, you decide to apply for a new position elsewhere. You ask your manager, Greg, for a recommendation, which he is happy to provide. At the end of the week, a friend of yours from work, Lisa, comes up to you looking concerned. She says she wants you to see a conversation between her and Robert. Robert's texts are in grey and Lisa's are in blue.

Please indicate the level of each mood you are currently feeling.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How relaxed do you feel right now?	○	○	○	○	○	○	○
How frightened do you feel right now?	○	○	○	○	○	○	○
How happy do you feel right now?	○	○	○	○	○	○	○
How angry do you feel right now?	○	○	○	○	○	○	○
How anxious do you feel right now?	○	○	○	○	○	○	○
How sad do you feel right now?	○	○	○	○	○	○	○

Do your best to list all thoughts and emotions that occurred to you during and in response to reading this exchange. Please list at least 5 separate thoughts.

_____

_____

_____

Alex

You've recently lost your job due to circumstances beyond your control. You have been looking for a new position, but it's been challenging to find a good fit, and despite numerous interviews, you are still unemployed. You decide to confide in a close family member, Alex, expressing how difficult it has been to find another job. You share that you haven't told anyone else about losing your previous job, and in preparation for a big family event the following week, ask her to keep this information secret, explaining that you're not ready to discuss it with everyone. Alex assures you that she understands and promises not to say anything. Fast forward to the day of the family event. You've been searching for job opportunities all day, and your phone has been on silent to minimize distractions. When you finally pick it up, you discover many missed messages in a family group chat.

Please indicate the level of each mood you are currently feeling.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
How relaxed do you feel right now?	○	○	○	○	○	○	○
How frightened do you feel right now?	○	○	○	○	○	○	○
How happy do you feel right now?	○	○	○	○	○	○	○
How angry do you feel right now?	○	○	○	○	○	○	○
How anxious do you feel right now?	○	○	○	○	○	○	○
How sad do you feel right now?	○	○	○	○	○	○	○

Do your best to list all thoughts and emotions that occurred to you during and in response to reading this exchange. Please list at least 5 separate thoughts.

_____

_____

_____

Young Schema Questionnaire – Revised (YSQ-R)

Listed below are statements that someone might use to describe him or herself. Please read each statement and decide how well it describes you. When you are not sure, base your answer on what you emotionally feel, NOT on what you think to be true. Choose the highest rating from 1 to 6 that describes you.

RATING SCALE:
1 = Completely untrue of me
2 = Mostly untrue of me
3 = Slightly more true than untrue
4 = Moderately true of me
5 = Mostly true of me
6 = Describes me perfectly

	Completely untrue of me (1)	Mostly untrue of me (2)	Slightly more true than untrue (3)	Moderately true of me (4)	Mostly true of me (5)	Describes me perfectly (6)
1. I haven't gotten enough love and attention (1)	○	○	○	○	○	○
2. For the most part, I haven't had someone to depend on for advice and emotional support (2)	○	○	○	○	○	○
3. For much of my life, I haven't had someone who wanted to get close to me and spend a lot of time with me. (3)	○	○	○	○	○	○
4. For much of my life, I haven't felt that I am special to someone. (4)	○	○	○	○	○	○
5. I have rarely had a strong person to give me sound advice or direction when I'm not sure what to do. (5)	○	○	○	○	○	○
6. I worry that people I feel close to will leave me or abandon me. (6)	○	○	○	○	○	○
7. I don't feel that important relationships will last; I expect them to end. (7)	○	○	○	○	○	○
8. I feel addicted to partners who can't be there for me in a committed way. (8)	○	○	○	○	○	○

9. I become upset when someone leaves me alone, even for a short period of time. (9)	○	○	○	○	○	○
10. I can't let myself get very close to other people, because I can't be sure they'll always be there. (10)	○	○	○	○	○	○
11. The people close to me have been very unpredictable: one moment they're available and nice to me; the next, they're angry, upset, self-absorbed, fighting, etc. (11)	○	○	○	○	○	○
12. I need other people so much that I worry about losing them. (12)	○	○	○	○	○	○
13. I can't be myself or express what I really feel, or people will leave me. (13)	○	○	○	○	○	○
14. I feel that I cannot let my guard down in the presence of other people, or else they will intentionally hurt me. (14)	○	○	○	○	○	○
15. It is only a matter of time before someone betrays me. (15)	○	○	○	○	○	○
16. I have a great deal of difficulty trusting people. (16)	○	○	○	○	○	○

17. I set up "tests" for other people, to see if they are telling me the truth and are well-intentioned. (17)	○	○	○	○	○	○
18. I subscribe to the belief: "Control or be controlled." (18)	○	○	○	○	○	○
19. I'm fundamentally different from other people. (19)	○	○	○	○	○	○
20. I don't belong; I'm a loner. (20)	○	○	○	○	○	○
21. I always feel on the outside of groups. (21)	○	○	○	○	○	○
22. No one really understands me. (22)	○	○	○	○	○	○
23. I sometimes feel as if I'm an alien. (23)	○	○	○	○	○	○
24. No one I desire would want to stay close to me if he/she knew the real me. (24)	○	○	○	○	○	○
25. I am inherently flawed and defective. (25)	○	○	○	○	○	○
26. I feel that I'm not lovable. (26)	○	○	○	○	○	○
27. I am too unacceptable in very basic ways to reveal myself to other people. (27)	○	○	○	○	○	○

28. When people like me, I feel I am fooling them. (28)	○	○	○	○	○	○
29. I cannot understand how anyone could love me. (29)	○	○	○	○	○	○
30. Almost nothing I do at work (or school) is as good as other people can do. (30)	○	○	○	○	○	○
31. Most other people are more capable than I am in areas of work (or school) and achievement. (31)	○	○	○	○	○	○
32. I'm a failure. (32)	○	○	○	○	○	○
33. I'm not as talented as most people are at their work (or at school). (33)	○	○	○	○	○	○
34. I often feel embarrassed around other people, because I don't measure up to them in terms of my accomplishments. (34)	○	○	○	○	○	○
35. I often compare my accomplishments with others and feel that they are much more successful. (35)	○	○	○	○	○	○
36. I do not feel capable of getting by on my own in everyday life. (36)	○	○	○	○	○	○

37. I believe that other people can take of me better than I can take care of myself. (37)	○	○	○	○	○	○
38. I have trouble tackling new tasks outside of work unless I have someone to guide me. (38)	○	○	○	○	○	○
39. I screw up everything I try, even outside of work (or school). (39)	○	○	○	○	○	○
40. If I trust my own judgment in everyday situations, I'll make the wrong decision. (40)	○	○	○	○	○	○
41. I feel that I need someone I can rely on to give me advice about practical issues. (41)	○	○	○	○	○	○
42. I feel more like a child than an adult when it comes to handling everyday responsibilities. (42)	○	○	○	○	○	○
43. I find the responsibilities of everyday life overwhelming. (43)	○	○	○	○	○	○
44. I feel that a disaster (natural, criminal, financial, or medical) could strike at any moment. (44)	○	○	○	○	○	○

45. I worry about being attacked. (45)	○	○	○	○	○	○
46. I take great precautions to avoid getting sick or hurt. (46)	○	○	○	○	○	○
47. I worry that I'm developing a serious illness, even though nothing serious has been diagnosed by a physician. (47)	○	○	○	○	○	○
48. I worry a lot about the bad things happening in the world: crime, pollution, etc. (48)	○	○	○	○	○	○
49. I feel that the world is a dangerous place. (49)	○	○	○	○	○	○
50. My parent(s) and I tend to be overinvolved in each other's lives and problems. (50)	○	○	○	○	○	○
51. It is very difficult for my parent(s) and me to keep intimate details from each other, without feeling betrayed or guilty. (51)	○	○	○	○	○	○
52. My parent(s) and I must speak to each other almost every day, or else one of us feels guilty, hurt, disappointed, or alone. (52)	○	○	○	○	○	○

53. I often feel that I do not have a separate identity from my parents or partner. (53)	○	○	○	○	○	○
54. It is very difficult for me to maintain any distance from the people I am intimate with; I have trouble keeping any separate sense of myself. (54)	○	○	○	○	○	○
55. I often feel that I have no privacy when it comes to my parent(s) or partner. (55)	○	○	○	○	○	○
56. I feel that my parent(s) are, or would be, very hurt about my living on my own, away from them. (56)	○	○	○	○	○	○
57. I believe that if I do what I want, I'm only asking for trouble. (57)	○	○	○	○	○	○
58. In relationships, I let the other person have the upper hand. (58)	○	○	○	○	○	○
59. I've always let others make choices for me, so I really don't know what I want for myself. (1)	○	○	○	○	○	○
60. I worry a lot about pleasing other people, so they won't reject me. (2)	○	○	○	○	○	○

61. I will go to much greater lengths than most people to avoid confrontations. (3)	○	○	○	○	○	○
62. I give more to other people than I get back in return. (4)	○	○	○	○	○	○
63. I'm the one who usually ends up taking care of the people I'm close to. (5)	○	○	○	○	○	○
64. No matter how busy I am, I can always find time for others. (6)	○	○	○	○	○	○
65. I've always been the one who listens to everyone else's problems. (7)	○	○	○	○	○	○
66. Other people see me as doing too much for others and not enough for myself. (8)	○	○	○	○	○	○
67. No matter how much I give; I feel it is never enough. (9)	○	○	○	○	○	○
68. I worry about losing control of my actions. (10)	○	○	○	○	○	○
69. I worry that I might seriously harm someone physically or emotionally if my anger gets out of control. (11)	○	○	○	○	○	○

70. I feel that I must control my emotions and impulses, or something bad is likely to happen. (12)	○	○	○	○	○	○
71. A lot of anger and resentment build up inside of me that I don't express. (13)	○	○	○	○	○	○
72. I am too self-conscious to show positive feelings to others (e.g., affection, showing I care). (14)	○	○	○	○	○	○
73. I find it embarrassing to express my feelings to others. (15)	○	○	○	○	○	○
74. I find it hard to be warm and spontaneous. (16)	○	○	○	○	○	○
75. I control myself so much that people think I am unemotional. (17)	○	○	○	○	○	○
76. People see me as uptight emotionally. (18)	○	○	○	○	○	○
77. I must be the best at most of what I do; I can't accept second best. (19)	○	○	○	○	○	○
78. I strive to keep almost everything in perfect order. (20)	○	○	○	○	○	○
79. I have so much to accomplish that there is almost no time to really relax. (21)	○	○	○	○	○	○

80. I must meet all my responsibilities. (22)	○	○	○	○	○	○
81. I often sacrifice pleasure and happiness to meet my own standards. (23)	○	○	○	○	○	○
82. I can't let myself off the hook easily or make excuses for my mistakes. (24)	○	○	○	○	○	○
83. I always must be Number One, in terms of my performance. (25)	○	○	○	○	○	○
84. I have a lot of trouble accepting "no" for an answer when I want something from other people. (26)	○	○	○	○	○	○
85. I hate to be constrained or kept from doing what I want. (27)	○	○	○	○	○	○
86. I feel that I shouldn't have to follow the normal rules and conventions other people do. (28)	○	○	○	○	○	○
87. I often find that I am so involved in my own priorities that I don't have time to give to friends or family. (29)	○	○	○	○	○	○
88. People often tell me I am very controlling about the ways things are done. (30)	○	○	○	○	○	○

89. I can't tolerate other people telling me what to do. (31)	○	○	○	○	○	○
90. I can't seem to discipline myself to complete routine or boring tasks. (32)	○	○	○	○	○	○
91. Often I allow myself to carry through on impulses and express emotions that get me into trouble or hurt other people. (33)	○	○	○	○	○	○
92. I get bored very easily. (34)	○	○	○	○	○	○
93. When tasks become difficult, I usually cannot persevere and complete them. (35)	○	○	○	○	○	○
94. I can't force myself to do things I don't enjoy, even when I know it's for my own good. (36)	○	○	○	○	○	○
95. I have rarely been able to stick to my resolutions. (37)	○	○	○	○	○	○
96. I often do things impulsively that I later regret. (38)	○	○	○	○	○	○
97. It is important to me to be liked by almost everyone I know. (39)	○	○	○	○	○	○

98. I change myself depending on the people I'm with, so they'll like me more. (40)	○	○	○	○	○	○
99. My self-esteem is based mostly on how other people view me. (41)	○	○	○	○	○	○
100. Even if I don't like someone, I still want him or her to like me. (42)	○	○	○	○	○	○
101. Unless I get a lot of attention from others, I feel less important. (43)	○	○	○	○	○	○
102. You can't be too careful; something will almost always go wrong. (44)	○	○	○	○	○	○
103. I worry that a wrong decision could lead to disaster. (45)	○	○	○	○	○	○
104. I often obsess over minor decisions, because the consequences of making a mistake seem so serious. (46)	○	○	○	○	○	○
105. I feel better assuming things will not work out for me, so that I don't feel disappointed if things go wrong. (47)	○	○	○	○	○	○
106. I tend to be pessimistic. (48)	○	○	○	○	○	○

107. If people get too enthusiastic about something, I become uncomfortable and feel like warning them of what could go wrong. (49)	○	○	○	○	○	○
108. If I make a mistake, I deserve to be punished. (50)	○	○	○	○	○	○
109. There is no excuse if I make mistake. (51)	○	○	○	○	○	○
110. If I don't do the job, I should suffer the consequences. (52)	○	○	○	○	○	○
111. It doesn't matter why I make a mistake; when I do something wrong, I should pay the price. (53)	○	○	○	○	○	○
112. I'm a bad person who deserves to be punished. (54)	○	○	○	○	○	○
113. People who don't "pull their own weight" should get punished in some way. (55)	○	○	○	○	○	○
114. Most of the time, I don't accept the excuses other people make. They're just not willing to accept responsibility and pay the consequences. (56)	○	○	○	○	○	○

115. I hold grudges, even after someone has apologized. (57)	○	○	○	○	○	○
116. I get angry when people make excuses for themselves or blame other people for their problems. (58)	○	○	○	○	○	○

Debrief

Thank you for taking the time to complete this study.

This study intends to explore people's experiences of anger in various social situations. The different scenarios you were asked to imagine yourself in were previously determined to be situations very likely to trigger anger in a wide range of individuals. Your participation provides valuable insights into the diverse thoughts that accompany the experience of anger, which aids our understanding of how treatment efforts can more effectively target these thoughts. By exploring the different aspects of anger experiences, including individual perceptions of self and typical expressions of anger and aggression, we aim to increase our knowledge of the relationship between anger and cognition.

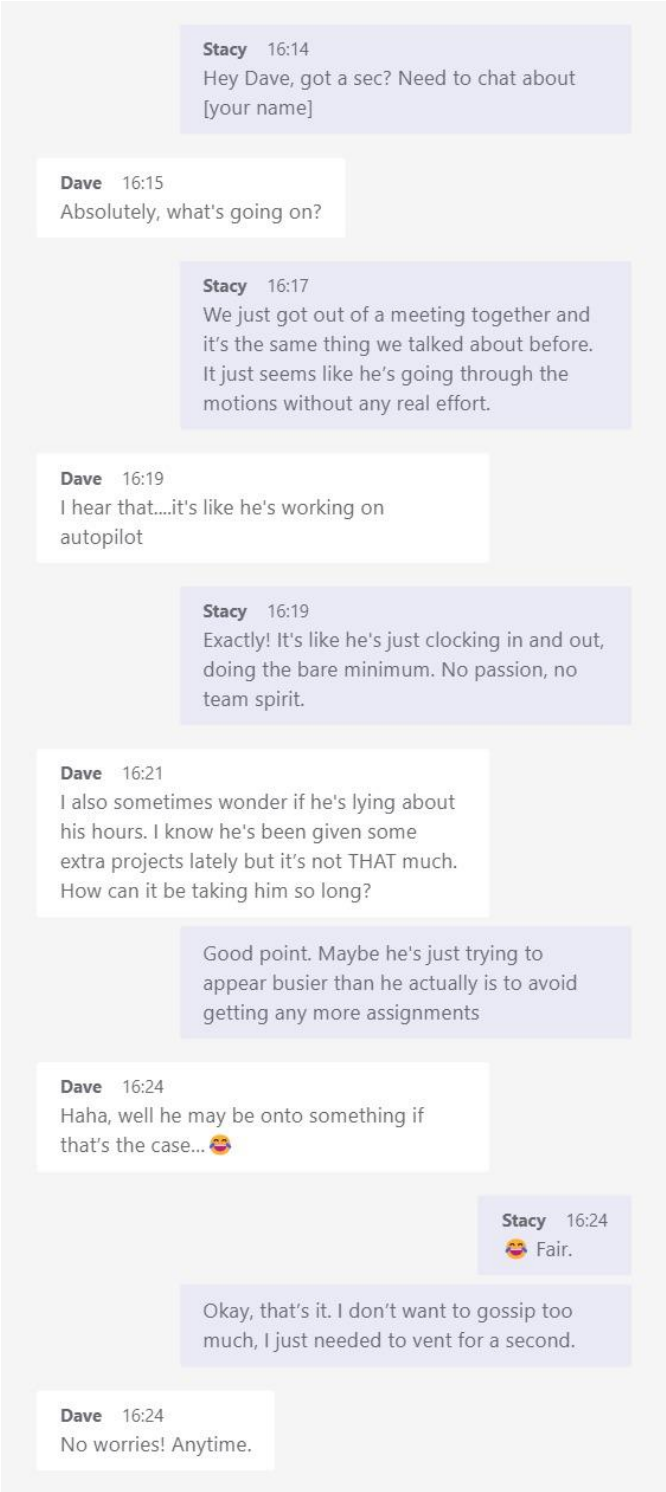
If you experienced an increase in anger during this study, that is very normal. Similar studies revealed that you will likely return to your baseline mood within 5 minutes of completing this study. If you would like more resources on how to manage your anger please refer to the below:

https://www.apa.org/topics/anger/control

https://www.healthline.com/health/mental-health/how-to-control-anger#1

If you have any additional questions or concerns about this study, please reach out to katharine.romero19a@stjohns.edu directly.

APPENDIX B
Scenario Descriptions with Corresponding Text Conversations



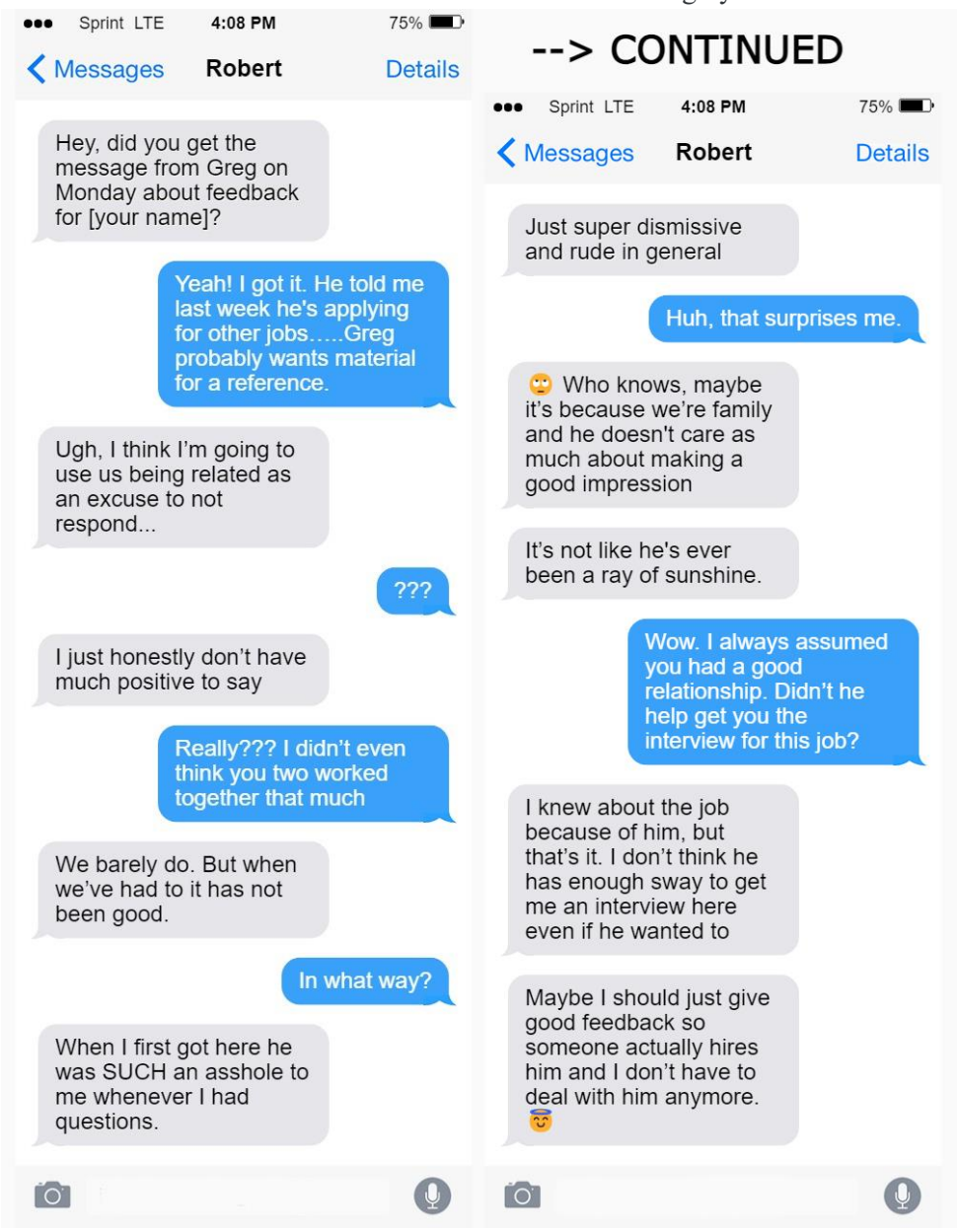
Scenario 1: Dave and Stacy

Work obligations have been at an all-time high recently, and you have consistently been working longer hours than usual for the past few weeks. You find yourself sacrificing personal time, missing meals at home, and last week, you even had to bail on your best friend's birthday dinner to meet a big deadline. You've noticed your colleagues aren't given nearly as many tasks as you, but when you've asked for their help, they've told you they are too busy to assist. Your colleague, Stacy, calls you over to her desk one day because she needs help installing a program on her computer. As you're sitting at her desk, she gets a phone call and excuses herself from the room but says you are welcome to get started. When you turn her computer on you see a work chat application up and a conversation between Stacy and another colleague, Dave.

Scenario 2: Robert

You recently helped a family member, Robert, get a new job through your connections at work. Although you are not required to interact with Robert directly, you now work with some of the same colleagues and you also report to the same manager. You have gone out of your way to make sure that Robert is comfortable in his new job, answering his questions about difficult tasks, training him on different procedures, and making sure that others include him when they go out for lunch and after-work activities.

After a few months, you decide to apply for a new position elsewhere, and you ask your manager, Greg, for a recommendation, which he is happy to provide. A friend of yours from work, Lisa, comes up to you at the end of the week looking concerned. She says she wants you to see a conversation between her and Robert. Robert's texts are in grey and Lisa's are in blue.



Scenario 3: Alex

You've recently lost your job due to circumstances beyond your control. You have been looking for a new position, but it's been challenging to find a good fit, and despite numerous interviews, you are still unemployed. You decide to confide in a close family member, Alex, expressing how difficult it has been to find another job. You share that you haven't told anyone else about losing your previous job, and in preparation for a big family event the following week, ask her to keep this information secret, explaining that you're not ready to discuss it with everyone. Alex assures you that she understands and promises not to say anything. Fast forward to the day of the family event. You've been searching for job opportunities all day, and your phone has been on silent to minimize distractions. When you finally pick it up, you discover many missed messages in a family group chat.

APPENDIX C

Articulated Thoughts in Simulated Situations – Anger Scenarios Coding Manual

General

Subjects were asked to provide their immediate thoughts and feelings in response to three different imagined scenarios intended to induce an anger response. They were requested to provide at least five separate thoughts – some provided more, some provided less.

Articulated statements can include codable responses, neutral/miscellaneous responses, or responses that do not contain enough contextual information to differentiate reliably. For codable responses, thoughts will contain a range of content that may or may not include emotional responses, cognitive responses, motivations, behavioral responses, and articulated provocations/triggers. Each separate thought should be coded for as many relevant codes as possible. Thoughts are separate variables on the data spreadsheet provided.

Scenarios

For context, the three scenarios appear in a separate attachment. Briefly, they are as follows:

Scenario 1: The subject is asked to imagine that they are in a scenario where, after being asked to help a colleague (Stacy) install a computer program, they see a conversation on Stacy's computer between Stacy and another colleague, Dave, talking about how the participant is not a team player and they suspect he/she/they have been lying about their workload and hours.

Scenario 2: The subject is asked to imagine they are in a scenario where a friend and colleague (Lisa) informs them that their family member (Robert) has been speaking badly about the participant to work colleagues after the participant helped Robert get a job at the company

Scenario 3: The subject is asked to imagine they are in a scenario where they have recently been let go from their job and have asked a family member (Alex) to keep it a secret in anticipation of an upcoming family event. In a family group chat before the event, Alex informs other family members that the participant was fired.

All three of these scenarios were ranked in the top 10 most likely to induce anger in a pilot study of 79 different scenarios across different triggers and types of transgressors (family members, strangers, romantic partners, etc.)

Quick Guide

Emotional Responses (Anger, Fear, Sadness, Hurt, Surprise, Shame, Regret, Disgust)
Behavioral Responses (Physical Aggression, Verbal Aggression, Indirect Aggression, Passive Aggression, Relational Aggression, Revenge, Confrontation)
Provocations (Betrayal, Dishonesty, Disregarded, Unfairness, Gossip)
Physical Arousal
Cognitive Responses (Irrational Beliefs: Global Negative Evaluations with and without Inflammatory Labeling, Self-Derogatory Labeling, Demandingness, Frustration Intolerance, Catastrophic Evaluation; Cognitive Distortions: Code of Honor, Hostile Attribution, Personalization, Overgeneralization, Mind Reading)
Coping Strategies (Negative: Withdrawal or Avoidance, Self-Blame, Resentment; Positive: Questioning/Perspective Taking, Adaptive Thinking, Problem-Solving, Anger Control Statements)
Neutral/Miscellaneous
Not Enough Information to Code

Emotional Responses

Subjects often include several emotions they experience in response to the scenarios. Some subjects might expand upon why they feel that way and how they imagine they would respond, while others are briefer in their responses and only include the emotion. For this study, we will be differentiating between adaptive and maladaptive emotions. The **BOLDED** emotion words are considered **disturbed** emotions, and the *ITALICIZED* emotion words are considered *non-disturbed* or *adaptive* emotions. Adaptive emotion words may be found with non-adaptive codable content (for instance, aggressive responses or cognitive distortions). In these cases, you should still code the emotion as adaptive.

Below, you will find a list of general emotion categories with their corresponding **disturbed** and *adaptive* emotions. This list is not exhaustive but includes some common synonyms and variations of the emotion codes. If the emotion word used is not found on this list, you can use your best judgment based on the context of the rest of the response and your own verbal knowledge.:

Anger: Anger, rage, mad, *irritated, disdain, annoying, frustrating*
Fear: Fear, anxiety, worried, overwhelmed, stressed, scared, *concerned, unsettled, uneasy*
Sadness: Depression, despair, discouragement, disheartened, *sadness, disappointment, letdown*
Surprise: Surprised, shocked, in disbelief, alarmed, **stunned, bewildered**, *amazement-amazed, astonished.*

Surprise can also be coded for statements that clearly demonstrate the respondent's expectations were not met. For instance, “I really didn’t expect him to act this way” or “I can’t believe she did this.”

Hurt: Hurt, offended, wounded, indignant, *miffed*

Shame: Shame, embarrassment, humiliation, *regret, remorse, repentance.*

Disgust: Disgust, repulsion, revulsion, *antipathy***.**

Behavioral Responses

These codes can be used when subjects articulate what they would do, feel like doing, or think about doing in response to the imagined scenario. DO code the behavioral response if the respondent states they would consider acting that way, even if the statement is not definitive (i.e., I would want to refuse to help her anymore). DO NOT code the behavioral response if the respondent immediately follows up the consideration with a statement indicating that they would think about it but wouldn’t act on it; instead, code this as an **Anger Control Statement (ACS) (**i.e., I would want to refuse to help her anymore, but that’s not who I am)**.**

Physical Aggression (PhA) would be used for statements involving a participant articulating thoughts of using physical force with the intent to harm or intimidate another person. Words to be looking for would be “hit,” “strangle,” “punch,” “shove,” “slap,” and “throw.”

Passive Aggression (PA) would be used for statements characterized by thoughts of indirect expressions of hostility, such as procrastination, stubbornness, or deliberate inefficiency, to avoid direct confrontation. For example, they refuse to continue to work on a project, ignore someone, walk away without explaining why, etc.

Example: “Why should I help when they are just talking badly about me? I don't feel like doing this anymore.”

Passive aggression **should not** be coded if an individual articulates that they would decrease their interactions or help the transgressor in the future, but not in a way meant primarily to convey hostility, resentment, or other negative emotions.

Example: “I would probably stop going out of my way to help this person beyond what is necessary for our job.”

Indirect Aggression (IA) would be used for statements involving thoughts to engage in any **covert** attempts to damage or sabotage a person's property or career.

Example: “Maybe I should find something to get you in trouble before I inevitably leave.”

Relational Aggression (RA) would include any thoughts of damaging someone’s social relationships or reputation, such as excluding them from social activities or spreading harmful gossip. Statements indicating that the subject would want to discontinue the relationship with the transgressor entirely should also be coded as relational aggression.

Example: "I'd talk a lot of garbage about him to our family."/ "This would be enough for me to cut ties with her immediately."
Verbal Aggression (VA) would include any thoughts of using words to harm, insult, or demean another person. Words to be looking for would be "yell," "scream," "sarcastic statements," and "curse."
Example: "When I see her, I will definitely rip into her."
Confrontation should be used for statements indicating that a respondent wants to "confront" the transgressor. If additional information is given that conveys either aggressive behaviors or positive coping through problem-solving and assertive action, code these statements into either of those categories. However, if you do not have enough context to categorize the statement into either of these codes, it should just be coded as a confrontation.
Example: "I would want to confront her" – Confrontation
Example: "I would confront her and yell at her if she was nearby" – Verbal aggression.
Example: "I would confront her and explain how her actions hurt my feelings and why I asked her to keep that information private." – Positive Coping – Problem-Solving

Motives

Revenge (REV) would include any thoughts or statements reflecting a desire to seek revenge, vengeance, or "get back" at those at whom the respondent is angry. Revenge should only be coded if the words revenge, vengeance, get even, direct retribution, or retaliation are referenced.
Example: "I'm thinking about revenge, to be honest"/"I'm going to tell his worst secret to the groupchat to get even with him."
Coercion (COER) would include any words that indicate the behaviors intended to control the target of the anger to encourage or force compliance with the ' wishes or desires.
Experiential Avoidance (EXPAV) would be used if the subject indicated that their behavior had the intention or goal to escape, avoid, or distract from the internal sensation or emotional experience of their anger.

Provocations

These codes should be used when the respondent indicates what about the scenario or activating event provokes or "triggers" their emotional or behavioral response. That is, they classify the experience as a type of event.
Betrayal – Statements articulating experiences of violations of trust resulting from broken promises or others acting in a harmful or disloyal way. Betrayal should always be coded if the respondent uses the word "betray" or "betrayal" and can often be coded if there is mention of broken trust or promises.

Example: "I trusted him and helped him get this job, and now he's talking badly about me behind my back."

Powerlessness - Statements articulating situations where individuals feel unable to influence outcomes or assert control.

Example: "I would also not feel in control of how my personal information is shared with others."

Unfairness - Statements articulating perceived injustices or unequal treatment. Often, these statements would include words such as "unfair" or "unjust," but **Unfairness** can be coded when the respondent perceives a discrepancy or disparity in how they are treated compared to others, and this perceived inequity provokes their response.

Example: "I'm frustrated that I'm overburdened with work because I'm sacrificing personal time while my colleagues don't seem to be."

Dishonesty – Statements articulating that lying or dishonesty is the provocation for negative emotionality. To be coded for dishonesty, this must be the primary provocation. For instance, "I trusted him, and then he lied to me" would be coded as **Betrayal** since the trigger for this respondent isn't the lie itself, but that there was a violation of trust.

Example: "It makes me very upset when people say things that aren't true about me."

In this example, the respondent says "people," which doesn't give us an indication that there is a breach of relationship, trust, or loyalty with who is saying things that aren't true, meaning we can only code "Dishonesty" for this statement

Example: "I feel betrayed and lied to."

In this example, the respondent puts betrayal and lying on the same level without indicating the relationship between the two. In this circumstance BOTH Betrayal and Dishonesty would be coded.

Disregarded – Statements articulating the respondent's perception of their opinions, feelings, or contributions as being ignored, unseen, or undervalued, which can provoke anger due to the perceived lack of respect and acknowledgment. Words/phrases that occur would be "ignored," "unseen," "undervalued," "unappreciated," "taken for granted," "disrespected," and "ungrateful."

Example: " He is so ungrateful, and it makes me feel used!"

Gossip – Statements articulating the respondent's dislike of "gossip" or the act of sharing information about the private affairs or personal matters of others, often casually or informally. This information may be true, exaggerated, or false and is usually shared without the subject's knowledge or consent. Similar to **Dishonesty**, **Gossip** should only be coded when it is the primary provocation and/or being talked about behind one's back is not triggering because of who is gossiping (as that would likely be a violation of trust and therefore betrayal), but rather the act itself.

Example: "I hate gossip"

Example: "I feel annoyed that colleagues are talking behind my back."

Physical Arousal

Physical Arousal: Statements articulating a physical response to their emotion, such as muscle tension, their face getting red, getting hot, sweating, shaking, etc.

Example: "I can feel a pit in my stomach"/"I can feel my face getting hot."

Cognitive Responses

Cognitive Distortions

Code of Honor (COH): Code of Honor would be used for statements representing the belief that one must behave aggressively to maintain their reputation and the respect of others in the presence of a threat. These statements convey thoughts or attitudes concerning social acceptance or power and are related to the importance of being viewed as strong and capable of protecting oneself.

Example: "I need to do something so they know they can't do this to me again"; "I must behave aggressively to protect my reputation"; "I will not let someone weaker than me or below me show me up."

Mind Reading (MR): Mind reading would be used for statements where a respondent assumes they know what others are thinking without any concrete evidence. Although some scenarios provide enough evidence for respondents to draw some hypotheses about what individuals think about different people and situations, mind reading would be used for codes that go above and beyond what a respondent could possibly know for certain.

Example: "Even if they did say nice things, it felt like a backhanded compliment; "Is everyone disappointed in me?"

Overgeneralization (OG): OG would be used for statements involving a respondent applying the scenario's events to all other events. These statements often include extreme words such as "never" or "always."

Example: "I'll never confide in him again"; "You can't trust anyone in this place."

Hostile attribution bias (HAB), or hostile attribution of intent, is the tendency to interpret others' behaviors as having hostile intent, even when the behavior is ambiguous or benign.

For example, a person with high levels of hostile attribution bias might see two people laughing and immediately interpret this behavior as two people laughing about them, even though the behavior was ambiguous and may have been benign. Although the scenarios have obvious transgressors, hostile attribution can be coded when there is hostile intent interpreted above and beyond the evidence presented in the scenario.

Example: "I think she must be trying to make me look bad in front of my other family members."

Irrational Beliefs

Demandingness (DEM) should be coded for statements representing an unrealistic and absolute expectation of events or individuals being the way a person desires them to be. Words/phrases that would be included would be "should," "must," "ought to," and "supposed to." Sometimes, demandingness can appear in the form of an exaggerated or incredulous question or a statement beginning with, "I cannot understand why ____." Use the code of demandingness if it is clear that the individual has placed a strict demand or expectation on the transgressor/subject of the thought that has been violated.

Ex. "People should really be more upfront about things"/"If he had an issue, why not talk to me about it?"/I cannot understand why he wouldn't just come and talk to me about this directly instead of talking to my coworkers about it instead of me.

Global Negative Evaluation (GNE): GNE will be used for statements representing broad, all-encompassing negative judgments that apply to an entire person rather than focusing on specific actions or attributes. This type of evaluation generalizes negative feelings or assessments in a way that can be overly simplistic or unjustified. Statements reflecting hatred can also be coded as GNE.

Example: "I think she is a bad person"; "I think he's completely ungrateful"; "I hate her."

DO NOT code GNE for negative statements that apply to an individual's actions rather than their character, i.e., "I think they acted so unprofessionally"; "I think she is behaving selfishly and does not have my best interests in mind."

> **GNE w/ Inflammatory Labeling (IL)**: Statements representing the belief that the transgressor is worthless or at least less valuable than others. IL includes such an evaluation along with a pejorative or label or profanity to describe the target of one's anger. These labels must be for another person and not the respondent.
>
> **Example**: "What an asshole jerk,"/"I think she's a small-minded idiot,"/" He is a manipulative user."

Self-Derogatory Labeling (SDL): Statements representing the belief that the self can be rated as a whole and that the self is worthless or at least less valuable than others. SDL includes such an evaluation along with a pejorative, label, or profanity to describe the self.

Example: "I feel like the loser everyone is talking about"/"I feel like an ass"

Frustration Intolerance (FI): Statements representing a demand for ease and comfort and reflecting an intolerance of discomfort. Frustration intolerance can be conveyed verbally through specific types of statements and language that reflect impatience, emotional overreaction, and a low tolerance for discomfort or setbacks. Words/phrases to look out for are "can't stand," "don't have the patience for", and "too much."
Example: "I can't stand either one of these individuals"; "This would be too much for me, I think I would totally lose it."
Catastrophic Evaluation (CE): Statements representing an exaggeration of the negative consequences of a situation to an extreme degree so that an unfortunate occurrence becomes ''terrible,'' "awful," the "worst thing" that could happen, above and beyond what the scenario is
Example: "This is going to make the family gathering terrible," "I feel like the world is crashing down on me."

Coping Strategies

Negative Coping (NC)

Self-Blame: Statements in which a subject attributes negative outcomes or situations to their own actions, decisions, or inherent flaws. This often involves excessive self-criticism or guilt.
Example: "I should not have helped him"/"This is my fault for being so naïve"
Withdrawal or Avoidance: Expressions indicating a desire to retreat from the situation or to avoid dealing with the problem. This includes both physical withdrawal and mental disengagement. This also includes substance abuse.
Example: "I would definitely make an excuse not to go to the family event tonight,"/"I would walk out of work right then and there,"/ "I'm definitely going to be drinking tonight."
Resentment: Resentment should be coded for thoughts or statements expressing strong feelings of bitterness or indignation towards the transgressor. Resentment reflects a deeper emotional reaction to feeling wronged or unjustly treated. This emotion is characterized by a sense of being wronged, with a focus on the unfairness or harm experienced. Look for expressions of lingering negative feelings, grudges, indignation, or a desire for acknowledgment of the wrongs done.
Example: "She has some crazy audacity to ask for my help and then complain about how I don't do any work while I'm helping her"/"I've broken my back for this company, and this is the thanks I get?"

Positive Coping (PC)

Questioning or Perspective-Taking: Statements that involve seeking to understand the situation better or considering it from different viewpoints. This includes asking questions to clarify the situation or empathizing with others' perspectives. Questions **SHOULD NOT** be automatically coded as positive coping questioning. They should reflect genuine curiosity and critical thinking rather than incredulity or demandingness. Explorative questions that weigh the pros and cons of alternative ways to act **should not** be coded as questioning and should be coded as problem-solving (below), as this is a form of consequential thinking.

Example: "I wonder what's going on with him that he's talking like this about me."

Example: Was I actually mean at some point? I wonder if I misunderstood the situation."

Adaptive Thinking: Expressions that involve reinterpreting a negative situation from a more positive or balanced perspective. This includes finding the silver lining, focusing on potential benefits or solutions, or using more rational/adaptive statements to discuss the scenario. Importantly, adaptive thinking does not have to be positive or even neutral. Instead, it is about adopting a perspective that is more constructive and realistic, allowing the individual to better cope with the situation and move forward. Instead of "they should have..." look for statements like, "I wish they had…" Instead of, "I hate her," a more adaptive statement would be, "I dislike her right now," Instead of "I can't work with these people anymore," more adaptive thinking would look like, "I would prefer not to work with these people" or even "I don't want to work with these people". You can also include statements that label actions as negative but avoid global negative evaluations or overgeneralizations (i.e., She acted in an unprofessional way vs. She is a rude person). Similarly, if an individual is considering the possibility of a bad event as a consequence of the scenario but there is some legitimacy or reality to this concern, we can consider that adaptive thinking (i.e., "I am concerned that his opinion of me will impact my reference negatively").

Problem Solving: Statements reflecting active efforts to address and resolve the issue. This includes identifying practical solutions, creating action plans, brainstorming ways to overcome obstacles, or engaging in assertive (but not aggressive) behaviors. Problem-solving statements should be self-focused, realistic solutions rooted in what the respondent has control over rather than demands placed on others. Problem-solving may include removing themselves from a situation identified as negative (for example, a "toxic work environment"), but you should use context to determine if this is true problem-solving or if the statement reflects frustration intolerance.

Example: "Given the excessive work demands and how they have impacted my personal life, in addition to unfriendly coworkers, it could be time for me to start looking for positions elsewhere." = Problem-solving vs. "This is awful. Time to quit!!!" (Catastrophic Evaluation and Frustration Intolerance)
Example: "Should I talk to him about this? If I ignore him, it feeds into his narrative but if I confront him, he'll know Lisa told me, and I don't want him to get mad at her."
Anger Control Statements: Statements where any articulated strategies to actively decrease negative emotionality, such as calmly discussing the situation, suggesting external mediation, or using coping techniques on one's own to regulate anger expression.
Example: "I need to walk away from the situation to calm down."

Neutral or Miscellaneous Comments

Neutral or Miscellaneous should be used for statements or thoughts that fall into one of several categories:

1. Emotional or physical content that has neutral valence (i.e., confusion, curiosity, calm, tired, relaxed)
2. Thoughts/statements related to aspects or individuals in the scenario that are not the transgressor(s) or directly related. This is particularly relevant for Scenario 2 (Robert), where some individuals comment on their gratitude towards their friend, Lisa, who shows them the text message conversation, as well as Scenario 3 (Alex), where some individuals comment on their reaction to other family members.
3. Objective, factual statements about the scenario, often directly reflecting the content of the scenario without including other codable content (Example: "I helped him get a job, and he is saying negative things about me to my colleagues.")

Not Enough Information to Code

This code should be used for statements that should not be considered neutral regarding emotional valence, but we do not have enough content to differentiate them further. For example, "upset" is inherently negative but can encompass many emotions. Other times, respondents would respond with one word or incomplete phrases where the target is unclear (Example: "This person should work remotely." Who is the person? Is it the respondent? Or the transgressor?).

Finally, sometimes it is unclear if a respondent is making a global negative evaluation or if they are commenting on the unique situation based on their phrasing. Often, this happens when the respondents choose to use the past tense, making it unclear

if they are referencing behavior or the transgressor's character (Example: "I thought they were unprofessional"). In this case, unless additional information is given that makes it possible to determine the subject's meaning, the response should be coded as "Not Enough Information to Code".

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