Emotion regulation profiles and mental health outcomes in American Indian adults

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Abstract

The strategies used to down regulate negative emotions or upregulate positive emotions are implicated in mood disorders, such as depression, and internalizing disorders, such as anxiety. Emotion regulation (ER) and mental health is largely understudied in American Indian (AI) populations. The limited extant data suggests that the rates of anxiety and depression symptoms are higher in AIs compared to the national average. Further, prior research shows that infrequent use of emotion reappraisal and frequent use of suppression is linked to symptoms of stress and depression in American Indian adults reporting childhood trauma. It is possible that ER strategies may cluster into unique profiles and inform differences in mental health amongst AIs. The following work expands prior literature by utilizing an extensive ER strategy questionnaire and explores how different levels of usage of ER strategies uniquely associate with reports of anxiety and depression in a sample of American Indian adults in 2022.

In american indian adults

ER is strongly implicated in mental health and the use of strategies to regulate emotions impacts various mood and internalizing symptoms, such as anxiety and depression (Schäfer, 2017). Assessing ER strategies and mood and internalizing disorders has led to the understanding that strategies can be both a source of risk and protection for anxiety and depression. Specifically, in racial and ethnic majority populations, research indicates that possessing more adaptive strategies in one's repertoire can combat maladaptive regulation as it can lead to increased flexibility in regulation in a wider variety of contexts (Silton et al., 2020). Regarding specific strategies, reappraisal, the reframing of a thought that is causing a negative emotion, is related to decreased anxiety and depression and increased psychological well-being. Whereas, suppression, the stifling of emotion-based thoughts or expressions, is related

to increased anxiety and depression and decreased psychological well-being (Haga et al., 2009; Schäfer et al., 2017). Moreover, strategies are also moderating factors in the relationship between trauma and adversity and internalizing and mood disorders (Heleniak et al., 2016). However, research assessing ER strategy use in ethnic minority populations is limited, especially regarding American Indian populations. There is evidence to suggest that in American Indian samples, ER strategies relate to stress and mood disorders. For example, the use of suppression is associated with childhood adversity and symptoms of depression (McCullen et al., 2022). However, the limited research evaluating strategy use in American Indian populations that has been observed has been limited to a focus on reappraisal and suppression (McCullen et al., 2022).

Rates of mood and internalizing disorders in American Indian communities is disproportionately high compared to the national average (McKinley et al., 2021). American Indians are also impacted by higher prevalence of childhood and intergenerational trauma (Beals et al., 2013; Manson et al., 2005; Warne & Lajimodiere, 2015), and ER strategies are potentially beneficial resources to cope with internalizing symptoms and trauma. Further, social-ecological models of resilience in American Indian communities posit that ER is one of several pathways to resilience (Kirmayer et

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al., 2011). Therefore, possessing and utilizing strategies to regulate emotions may be especially beneficial to this population, and understanding strategies that both help and hinder is a crucial step forward for mental health interventions in schools and in the community.

In addition to individual strategies, co-occurring *profiles* of strategies also have implications for mental health risk and resilience (Burke et al., 2018). Identifying strategy use profiles has also informed mental health intervention. Unfortunately, most of this information is also observed primarily in racial and ethnic majority samples with a considerably limited range of strategies (Lansing et al., 2019; Rodriguez et al., 2020). In summation, beyond the use of suppression and reappraisal, strategy-specific information is scant, and virtually nothing is known about specific profiles used to downregulate negative emotions and their impact on mental health in American Indian populations. Assessing a wider range of ER strategies would lend itself useful to evaluating profiles of strategy use. And given the vulnerability to, and increased rates of internalizing symptoms in American Indian populations, identifying profiles that highlight adaptive or maladaptive ER patterns is critical.

ER strategy profiles and anxiety and depression

Individuals who use ER strategy clusters or profiles which are often regarded as being maladaptive (e.g., avoidance, suppression, and rumination) more frequently than strategy clusters or profiles which are considered adaptive (e.g., reappraisal, acceptance, and problem-solving) have reported increased symptoms of depression and anxiety (Chesney et al., 2019). Such links between strategy profiles and depression and anxiety are demonstrated in both clinical and community samples (van den Heuvel et al., 2020).

Certain cognitive behavioral therapy and trauma-focused therapies have implemented practices targeting strategies to regulate emotions (Farnia et al., 2018; Strauss et al., 2019). The implementation of an individual centered approach for identifying ER profiles and profile impacts on mental health has clinical value in that it can assist in the tailoring of emotion-based components of interventions (Wytykowska et al., 2022). However, evidence of the implementation of profile-based knowledge to this point is limited, and within American Indian communities, virtually non-existent. One potential reason for this is the limited range of strategies assessed in mental health research. Assessing a wider range of strategies may add to a more complete picture of an individual's profile, thus, providing a greater ability to identify profiles that are linked to optimal mental health as well as targets for intervention.

ER strategies, anxiety, and Depression in american indian populations

As previously mentioned, the rates of internalizing symptoms such as anxiety, and mood symptoms, such as depression, are higher in American Indian communities compared to the national average (McKinley et al., 2021). Further, American Indians experience increased childhood trauma and adversity (Warne et al., 2017). Prior research in other racial and ethnic minority groups has shown a connection between childhood trauma and adversity and maladaptive ER strategies and that these connections may increase anxiety and depression later in life (for reviews, see: Li et al., 2022; McKay et al., 2021). Thus, gaining a more nuanced understanding of ER profiles in American Indian adults may enable future investigation of how these profiles relate to mental health. Unfortunately, beyond the limited research highlighting relations between reappraisal, suppression, and childhood trauma, stress, and depression in American Indian adults, little is known (McCullen et al., 2022; Tyra et al., 2021). Further, it does not appear that strategies beyond reappraisal and suppression have been measured in American Indian populations. Capturing a breadth of strategies is necessary to identify adaptive or maladaptive profiles.

Purpose

The objective of this study is to use an exploratory person-centered approach to assess the ER strategy use profiles that emerge in an American Indian sample, as well as to assess how identified profiles relate to mood and internalizing disorder symptoms (i.e., depression and anxiety). The purpose of utilizing a person-centered approach, or approach that focuses on identifying sub-group similarities as related to variables, rather than a variable-centered approach was due to the potential culture-based implications. Specifically, identifying sub-groups within a culture that vary on specific psychological measures may assist in identifying aspects of those sub-groups that serve to protect them or increase their vulnerability to various negative outcomes (Bámaca-Colbert & Gayles, 2010). We hypothesized that unique profiles would emerge that relate to both anxiety and depression. Specifically, we hypothesized that low frequency strategy use would relate to increased anxiety and depression whereas high frequency strategy use would relate to lower levels of anxiety and depression. Further, considering evidence to suggest suppression can relate to increased internalizing symptoms and decreased externalizing symptoms, we hypothesized that subgroups of people who utilized clusters consisting of more maladaptive strategies (i.e., suppression) would relate to increased anxiety and depression where subgroups of people who utilized clusters

of more adaptive strategies (i.e., reappraisal) would relate to decreased anxiety and depression.

Method

Participants

Participant's (n = 733) age was an of 36.88 (SD = 15.07, age range = 18–95) and the majority of participants were biological males (63.2%). A majority of participants identified with a tribe (64.4%) and 15.3% reported currently living on a tribal reservation.

Procedure

This study was approved by the institutional Review Board at Montana State University. Qualtrics used targeted recruiting to reach a convenience sample of AI adults. Qualtrics selected participants from a niche managed research panel for hard-to-reach groups (i.e., AIs). To be eligible for the study, participants had to identify as AI, live in the United States, and be at least 18 years of age. Qualtrics participants for these panels receive points for participation that they can use towards various incentives.

Before participating, all participants provided informed consent and were told that they could stop the survey at any point if they felt uncomfortable or unsafe. Our aim was to recruit as large of a sample as possible of American Indian adults from across the United States with the amount of funding available. Data quality screening took place via Qualtrics before sharing the data. This involved replacing respondents who finished in less than ½ of the median completion time and participants who started the survey, but who did not complete it. Fifty-two respondents were removed for these reasons. All de-identified data was sent in an Excel file to the principal investigator and was subsequently transferred to SPSS (IBM V 28) for statistical analyses.

Analytic Plan

Using a latent profile analysis (LPA) in MPlus 8 (Muthén & Muthén, 2017), we identified strategy-use profiles or probability-based clusters of participants who utilize (or not) specific strategies. The LPA identified the optimal number of subsets of participants who share similar strategy use patterns that relate to specific outcomes. To determine the optimal number of profiles, we considered several factors (Lanza & Cooper, 2016) including the Akaike Information Criteria (AIC), Sample-Size Adjusted Bayesian Information Criteria (BIC), and Entropy (reflects the effectiveness of categorization based on probability outcomes) measures when comparing models. We attempted to minimize the AIC and BIC and produce a strong entropy measure (approaching 1.00). Once profiles were identified, we explored how profiles related to various outcomes (i.e., anxiety and depression) using a one-way analysis of variance.

Measures

ER

The Extended ER Questionnaire - E-ERQ (Moreira et al., 2021) is a 22-item scale that assesses participants' prototypical regulatory strategies using the following strategies: cognitive reappraisal or reframing of emotions, expressive suppression or efforts to avoid and devalue emotions, distraction or averting attention away from selected emotions, selective attention or the strategy of focusing attention towards certain emotions, and situation selection or intentionally choosing specific situations to attune to or avoid. The following measure is an extended version of the ER Questionnaire originally designed by Gross & John, 2003. Participants respond to each item on a 7-point Likert-type scale ranging from 1 to 7 with 1 endorsing that they strongly disagree and 7 endorsing that they strongly agree. Reappraisal items demonstrated great internal consistency (Cronbach's $\alpha = 0.908$), as did suppression (Cronbach's $\alpha = 0.839$), distraction (Cronbach's $\alpha = 0.866$), selective attention (Cronbach's $\alpha = 0.88$), and situation selection (Cronbach's $\alpha = 0.844$).

Depression and anxiety

The Hospital Anxiety and Depression Scale - HADS (Snaith, 2003) is composed of 14-items that assess symptoms of anxiety and depression. The depression and anxiety subscales are each composed of 7 items. Respondents rate their symptoms using a four-point Likert-type scale (0–3). Scores are summed and can range from 0 to 21 for both subscales. The anxiety and depression subscales demonstrated very good internal consistency (Anxiety: Cronbach's $\alpha = 0.877$; Depression: Cronbach's $\alpha = 0.791$).

Results

Latent Profile Analysis

Figure 1 presents an LPA model in which 5 classes were distinguished (log-likelihood ratio = -5287.394; adjusted BIC = 10691.130). Entropy was best for the 5-class model (0.87) when compared to models 2–4 and 6. In general, profiles appeared to vary by frequency of use (low to high).
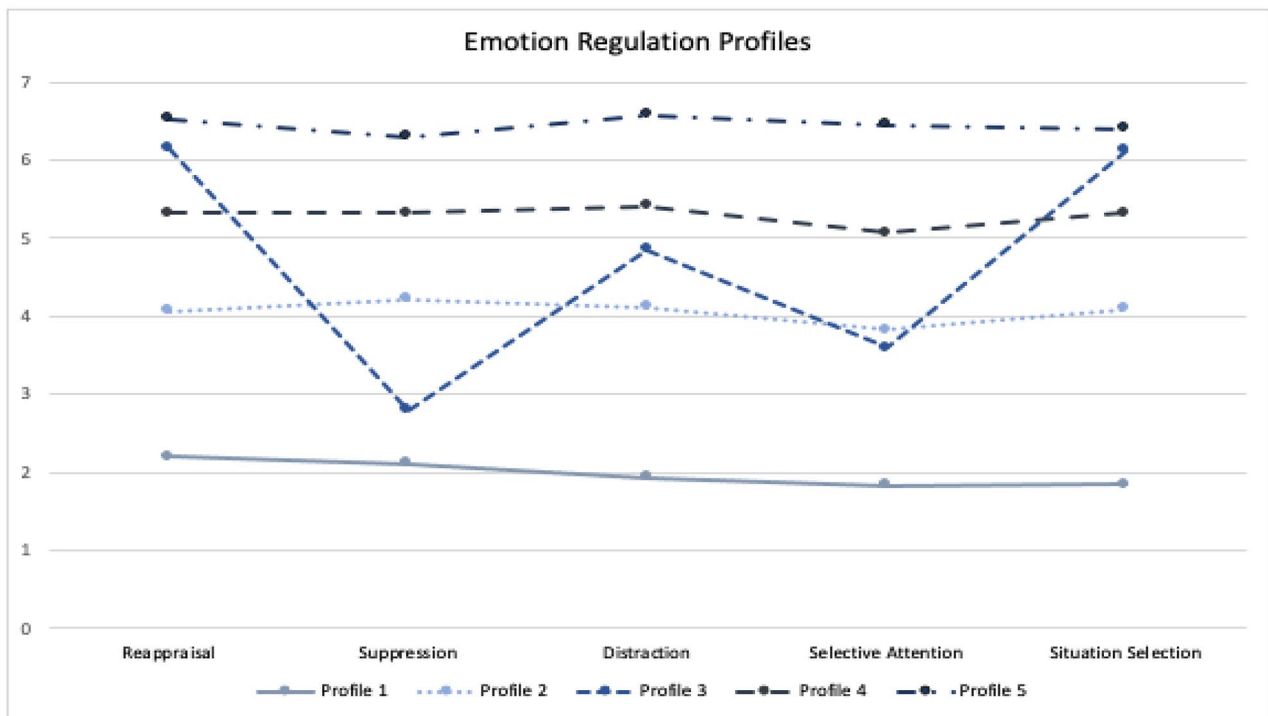
Fig. 1 ER strategy profiles. *Note* Profile #1 = Low regulators; Profile #2 = Low-Moderate regulators; Profile #3 = Selective regulators; Profile #4 = High-Moderate regulators; Profile #5 = High regulators

Table 1 ANOVA Results

Depression	Variation	Sums of Squares	DF	Mean Square	F	Sig.
	Between-Groups	475.2	4	118.8	4.27	< 0.001
	Within-Groups	20254.017	728	27.821		
	Total	20729.217	732			
Anxiety	Between-Groups	1386.65	4	346.663	20.77	0.002
	Within-Groups	12149.46	728	16.689		
	Total	13536.12	732			

Table 2 *Means and Standard Deviations of Profiles and Anxiety and Depression*

Measure	LPA profile	N	Mean	Std. Deviation
Anxiety	Low Regulators	40	10.27	4.43
	Low Moderate	402	9.95	4.78
	Selective	44	6.63	5.38
	High Moderate	171	9.54	5.83
	High Regulators	76	9.1	6.63
Depression	Low Regulators	40	8.75	4.13
	Low Moderate	402	7.99	3.99
	Selective	44	4.27	3.91
	High Moderate	171	6.56	4.33
	High Regulators	76	4.39	4.06

Profiles 1, 2, 4, and 5 are different in frequency. Specifically, profile 1 (low regulators) captured a subset of participants who utilize all strategies at a low frequency. Profiles 2 (low moderate regulators) and 4 (high moderate regulators) captured a subset of participants who utilize all strategies at a moderate frequency. And Profile 5 (high regulators) captured a subset of participants who utilize all strategies at a high frequency. Profile 3 (selective regulators) was unique compared to all other profiles and was characterized by a subset of participants who utilize high reappraisal, low suppression, moderate distraction and selective attention, and high situation selection.

ANOVA and ANCOVA results

ANOVA results indicated ER profile was significantly related to depression and anxiety (see Table 1).

A one-way ANCOVA was conducted to test profile membership predicting anxiety and depression when controlling for sex and age. Results indicated a significant difference for depression (F = 19.93, M sq. = 326.22, $p = <0.001$) and anxiety (F = 4.63, M sq. = 126.89, $p = .001$) when controlling for interest variables.

Post Hoc Analysis: Profile 1 (low regulators)

Profile 1 was significantly higher in depression compared to profile 3 (selective regulators) ($p = <0.001$, 95% CI = 2.03, 6.91), Profile 4 (high moderate regulators) ($p = .02$, 95% CI = 0.22, 4.15), and Profile 5 (high regulators) ($p = <0.001$, 95% CI = 2.17, 6.53).

Post Hoc Analysis: Profile 2 (low-Moderate regulators)

Profile 2 was higher in depression compared to Profile 3 ($p = <0.001$, 95% CI = 1.94, 5.49), Profile 4 ($p = .001$, 95% CI = 0.41, 2.45), and Profile 5 ($p = <0.001$, 95% CI = 2.20, 4.99).

Post Hoc Analysis: Profile 3 (selective regulators)

Tukey HSD post hoc analyses revealed the following: Profile 3 had significantly lower anxiety compared to Profile 1 (low regulators) ($p = .01$, 95% CI = -6.78, −0.48), Profile 2 (low moderate regulators) ($p = <0.001$, 95% CI = -5.61, 1.03), and Profile 4 (high moderate regulators) ($p = .01$, 95% CI = -5.34, −0.46). Further, Profile 3 (selective regulators) was significantly lower in depression compared to Profile 1 ($p = <0.001$, 95% CI = -6.91, -2.03), Profile 2 (low moderate regulators) ($p = <0.001$, 95% CI = -5.49, -1.94), and Profile 4 (high moderate regulators) ($p = <0.05$, 95% CI = -4.17, −0.40).

Post Hoc Analysis: Profile 4 (high-Moderate regulators)

Profile 4 (high moderate regulators) was significantly lower in depression compared to Profile 1 (low regulators) ($p = .02$, 95% CI = -4.15, −0.22) and Profile 2 (low moderate regulators) ($p = .001$, 95% CI = -2.45, −0.41) but higher compared to Profile 3 (selective regulators) ($p = <0.05$, 95% CI = 0.40, 4.17) and Profile 5 (high regulators) ($p = .001$, 95% CI = 0.62, 3.70).

Post Hoc Analysis: Profile 5 (high regulators)

Profile 5 did not significantly differ in anxiety compared to Profile 1, 2, and 4. However, Profile 5 had significantly lower depression compared to Profile 1 ($p = <0.001$, 95% CI = -6.53, -2.17), Profile 2 ($p = <0.001$, 95% CI = -4.99, -2.20), and Profile 4 ($p = .001$, 95% CI = -3.70, −0.62).

Discussion

To our knowledge, these findings are novel in that they use a data-driven approach to identify ER profiles and how profiles uniquely associate with symptoms of anxiety and symptoms of depression in a sample of American Indian adults. This is important given that American Indians experience disproportionately high rates of anxiety and depression, and minimal information is currently understood about how the use of strategies to regulate emotions may protect against or contribute to risk of poor mental health. These findings are also important considering evidence suggesting implications of ER and mental health in other minority groups (Wilson & Gentzler, 2021; Zhu & Deng, 2023). Specifically, suppression is a dominant strategy used to combat minority-related stress (i.e., discrimination), and difficulties regulating emotions moderate the relationship between discrimination and anxiety (Wilson & Gentzler, 2021; Zhu & Deng, 2023). Moreover, social-ecological models of resilience suggest ER may be one pathway to resilience in Native cultures (Kirmayer et al., 2011). However, strategies beyond suppression and reappraisal have seldom been assessed. Thus, these findings may have prevention and intervention implications for American Indian populations and the current investigation serves as an initial step forward.

We found that in a sample of 733 American Indian adults, five unique ER profiles emerged. Profiles 1 (low regulators), 2 (low moderate regulators), 4 (high moderate regulators), and 5 (high regulators) varied by frequency of use such that all people with profile 1 (low regulators) used all strategies with a low frequency, people with profile 2 (low moderate regulators) used all strategies with low to moderate frequency, people with profile 4 (high moderate regulators) used all strategies with moderate to high frequency, and people with profile 5 (high regulators) used all strategies with high frequency. Profile 3 (selective regulators) was unique in that it identified a subset of people who used high reappraisal, low suppression, moderate distraction and selective attention, and high situation selection. Regarding protective profiles, profile 3 (selective regulators) appeared to be protective against anxiety, and profiles 3 (selective regulators) and 5 (high regulators) appeared to be protective against depression.

One explanation for why these profiles may be protective against anxiety relates to reappraisal and situation selection. Specifically, reappraisal has been repeatedly related to lower levels of anxiety in ethnic majority and minority samples (Chahar Mahali et al., 2021). Although understudied in non-majority samples, situation selection has been demonstrated to reduce physiological arousal and reduce anxiety (Thuillard & Dan-Glauser, 2021; Webb et al., 2018). One potential explanation for why profile 5 (high regulators) may be

protective for depression but not anxiety relates to the lower use of suppression, distraction, and selective attention characteristic of profile 3 (selective regulators), such that people with anxiety may benefit from relying less on these specific strategies compared to others (Cho et al., 2019; Dryman & Heimberg, 2018; Mogg & Bradley, 1999).

Regarding profiles that identify potential risk, profiles 1 (low regulators) and 2 (low moderate regulators) appear to be related to the most risk for depression. These profiles identified people who utilize all strategies at a low frequency. One potential explanation for why general low strategy use may be a risk factor for depression but not anxiety may relate to the lack of use of reappraisal. Specifically, reappraisal depends heavily on being able to call on or upregulate positive thoughts and emotions in light of the presence of negative ones and this skill is more difficult for people who are experiencing depression symptoms (Carl et al., 2013).

Our findings are aligned with previous research which highlights relationships between ER strategies, ER strategy profiles, and anxiety and depression. However, our research builds upon this work by assessing ER strategy profiles in American Indian adults for the first time, and to our knowledge measures strategies that have not been represented in the limited extant work on ER in American Indian communities (i.e., distraction, situation selection, and selective attention). It also builds upon prior research by considering how these ER profiles may have different relationships with anxiety and depression, even though symptoms of anxiety and depression tend to be comorbid.

Regarding the potential implications for prevention and intervention development, there is evidence in majority groups that suggests ER strategies are an effective component of cognitive behavioral therapy in potentially reducing internalizing symptoms (Berking et al., 2008). Further, emotion regulation therapy (ERT) has been demonstrated to reduce generalized anxiety symptoms as well as major depression symptoms in a racially and ethnically diverse sample via mindfulness and metacognitive training (including reframing training) as well as visualization exposure (Renna et al., 2018). This has also been demonstrated in the preliminary qualitative findings of a minority-focused stress-based intervention which utilized ER as a component (Conway-Phillips et al., 2020). Thus, ER strategies may have a place in prevention programs and post-traumatic stress interventions for populations who experience increased stressors.

This research is not without limitations. First, these data are cross-sectional. Future research assessing strategy use, depression, and anxiety longitudinally is necessary to further understand directionality. Second, this is a relatively small sample of American Indian adults and does not represent potential geographic or tribal community differences. Third, although the E-ERQ assesses significant strategies, it does not account for all strategies, nor does it account for positive ER. Finally, the following dataset consisted of a nationwide sample of American Indians who live within tribal reservations and those who do not. Further, this study was composed of diverse American Indian tribes which all possess unique and differing cultural values within their respective communities. Therefore, we are unable to achieve a full understanding of the role of different ER practices within specific communities and how these differences may inform outcomes for better or worse.

Future research should aim to assess positive ER as well as constructs outside of strategy use (i.e., regulation difficulties) for a deeper understanding of the involvement of ER in resilience and mental health in American Indian populations. While this research demonstrates a first important step toward understanding how ER strategy profiles may contribute to mental health symptomology in American Indian adults, future work should investigate whether the relationship between ER strategy-use and profiles of ER and mental health is dependent on trauma exposure. In other words, it is possible that in the context of mental health, certain strategies to regulate emotions may be adaptive, particularly for American Indian adults who have experienced trauma/childhood adversity or who report thinking frequently about historical losses. Overall, these findings provide initial evidence to support the notion that specific ER strategy profiles may protect against anxiety and depression as well as pose risk.

Declarations

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