Borderline Features Mediate the Association between the Experience of Childhood Sexual Abuse and Opioid Misuse among Pregnant Women

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I am submitting herewith a thesis written by Chloe T. Cohen entitled "Borderline Features Mediate the Association between the Experience of Childhood Sexual Abuse and Opioid Misuse among Pregnant Women." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Jenny Macfie, Major Professor

We have read this thesis and recommend its acceptance:

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Dixie L. Thompson

Vice Provost and Dean of the Graduate School

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Borderline Features Mediate the Association between the Experience of Childhood Sexual Abuse and Opioid Misuse among Pregnant Women

A Thesis Defense Presented for the Master of Arts Degree
The University of Tennessee, Knoxville

Chloe Tess Cohen
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ABSTRACT

The relationship between experiences of childhood sexual abuse and opioid misuse in adults is well documented, specifically among women, but less is known about this association in pregnancy. No studies to date have investigated processes that could be the target of interventions to help women with childhood sexual abuse histories better care for their infants. In the current study, we examined borderline personality disorder features as mediators which may explain the link between childhood sexual abuse and opioid misuse during pregnancy. We sampled \(N=93\) pregnant women: \(n=55\) were misusing opioids during their pregnancies and \(n=38\) were at high risk due to non-drug related medical factors. Frequency and severity of sexual abuse exposure prior to age 18 were assessed using the Maltreatment and Abuse Chronology of Exposure (MACE; Teicher & Parigger, 2015); borderline features (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity) were assessed along a continuum using the Personality Assessment Inventory (PAI; Morey, 1991). We created a continuous opioid severity variable which ranged from 0 (negative urine assays for any drugs) to 3 (positive assays for unprescribed and/or illegal opiates) to measure participant outcomes. Findings indicated that total borderline features, as well as the individual features of identity disturbance, negative relationships, and self-harm/impulsivity were all mediators in the association between childhood sexual abuse and opioid misuse severity.

*Keywords*: childhood sexual abuse, opioid misuse, pregnancy, borderline personality disorder features
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CHAPTER ONE: INTRODUCTION

Opioid misuse is a national epidemic which by 2015 had affected an estimated 11.5 million Americans through prescription or illicit opioid use (Han et al., 2017). Among those affected are pregnant women (Stuart et al., 2018; Kurdziel-Adams et al., 2019; Macfie et al., 2020). Between 1999 and 2014, the number of pregnant women misusing opioids more than quadrupled (Haight et al., 2018). Opioid misuse during pregnancy may increase negative consequences not only for the mother but also for her baby. Infants who were prenatally exposed to opioids have been shown to be born at low birth weight (Patrick et al., 2015), have smaller head circumference compared to infants without prenatal opioid exposure (the developmental consequences of lower head circumference are not known; Towers et al., 2019), and are more likely to undergo neonatal opioid withdrawal syndrome, the long-term developmental effects of which are still unknown (NOWS; Honein et al., 2019). Importantly, pregnancy presents a unique opportunity for intervention to address opioid misuse and its etiologies. Expectant mothers are likely to be under consistent medical care due to frequent prenatal check-ups and may be motivated to discontinue their opioid misuse in order to avoid negative outcomes for their infants. Still, there is a gap in the substance abuse literature regarding opioid misuse during pregnancy, with far fewer studies investigating associations with opioid misuse in this population which may be targets for intervention.
CHAPTER TWO: LITERATURE REVIEW

Childhood Sexual Abuse and Opioid Misuse

One etiological pathway to opioid misuse that has been found for women more often than for men is the experience of childhood maltreatment, and in particular, childhood sexual abuse (Bartholomew et al., 2005; Branstetter et al., 2008; Conroy et al., 2009; Oviedo-Joekes et al., 2011; Stein et al., 2017). Among opioid-dependent women who were receiving medication-assisted treatment (MAT) such as naltrexone, methadone, or buprenorphine to maintain on doses which were high enough to prevent withdrawal symptoms but not high enough to cause euphoria, those with a history of childhood sexual abuse had a higher prevalence of comorbid mental health problems when compared to women without sexual abuse histories (Bartholomew et al., 2005). In addition, women with histories of sexual abuse are more likely to report psychological distress such as depression, anxiety, or suicidality, as catalysts for their drug use (Bartholomew et al., 2005; Simpson & Miller, 2002). Twin studies have also pointed to an increased risk for drug misuse following childhood sexual abuse that is stronger than the risk incurred by genetic and familial factors (Nelson et al., 2006; Sartor et al., 2007). One study reported that among same-sex twin pairs discordant for childhood sexual abuse, opioid use was more prevalent among twins with childhood sexual abuse as compared to their non-abused co-twins, suggesting that childhood sexual abuse is a unique contributing factor to later opioid misuse (Nelson et al., 2006).

Both psychological and biological factors may lead to a higher prevalence of opioid misuse among individuals who have experienced childhood sexual abuse. Those with early abuse exposure may self-mEDIATE with opioids to cope with depressive, anxious, and post-traumatic stress symptoms (Danovitch, 2016; Green et al., 2010). Another posited explanation is trauma-
induced over-activation of the hypothalamic-pituitary-adrenal (HPA) axis, which impacts the endogenous opioid system and induces symptoms such as hypervigilance, irritability, and exaggerated startle responses, all of which can be quelled by the numbing, analgesic properties of opioids (Danovitch, 2016; Figueroa & Silk, 1997; Garland et al., 2015; Penza, Heim, & Nemeroff, 2003; Shea et al., 2005). Still, there is little research investigating variables linking childhood sexual abuse to later opioid misuse which could be targeted in interventions. Building upon previous findings with the current sample which established a link between childhood sexual abuse and opioid misuse among pregnant women (Towers et al., 2019) as well as features of borderline personality disorder (Kurdziel-Adams et al., 2019), the current study seeks to explore features of borderline personality disorder as mediators which may explain that link.

**BPD as a Mediator between Childhood Sexual Abuse and Opioid Misuse**

Borderline personality disorder (BPD) is a severe, chronic disorder characterized by emotional instability, suicidal behavior, unstable and intense relationships, and impulsivity (American Psychiatric Association, 2013). Studies examining the experiences of pregnant women with borderline personality disorder have revealed that women with BPD tend to perceive their pregnancies and deliveries as traumatic experiences, and are more likely to give birth prematurely and have newborns with lower Apgar scores when compared to mothers without BPD (Bandelow et al., 2010; Blankley et al., 2015; Pare-Miron et al., 2016). In addition to a categorical diagnosis, BPD can be assessed with a self-report measure of borderline features along a continuum (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity; Morey, 1991). Borderline features are highly correlated with BPD diagnoses (Kurtz & Morey, 2001), and a cutoff score for the sum of all four borderline features is associated with a categorical diagnosis of BPD (Trull, 1995).
One well-established antecedent to BPD is childhood sexual abuse. Indeed, many individuals diagnosed with BPD report early, multiple, and sometimes chronic experiences of sexual abuse (Zanarini, 1997; Zanarini et al., 2002). Among psychiatric patients with BPD, 26.0% of adolescents and 62.4% of adults reported a childhood history of sexual abuse before the age of 18 (Temes et al., 2020). Overall severity of sexual abuse has been associated with increased severity of BPD symptoms, increased psychosocial impairment, and increased risk for suicidal behavior (Soloff, Lynch, & Kelley, 2002; Zanarini et al., 2002). In the current study, we therefore expected to find associations between childhood sexual abuse and heightened borderline features.

Borderline personality disorder is a risk factor in pregnancy, and these risks are compounded by comorbid opioid use. BPD is also frequently comorbid with opioid misuse that is not due to overlapping symptoms between BPD and opioid misuse (Frankenburg et al., 2014; Tragesser et al., 2013; Trull et al., 2018). Women with BPD are more likely than individuals without this disorder to misuse substances during their pregnancies (Blankley et al., 2015). Indeed, in the current sample, women categorized as above the clinical cutoff range for BPD (≥ 38; Trull et al., 2000) in terms of borderline features were 2.83 times more likely to be opioid users than women who were below this threshold (Kurdziel-Adams et al., 2020). Further, a meta-analysis of seven studies reported co-occurrence rates between 11.5 and 51% (N = 2263, 38.8% with BPD; Trull et al., 2018).

While little is known about the pathways which link BPD to opioid misuse, neurobiological and epigenetic findings suggest that deficient opioid receptors or lower availability of endogenous opioids (e.g., endorphins) may explain part of the pathophysiology underlying BPD (see Cattane et al., 2017 for a review). One study which investigated the role of
endogenous opioids among a sample of un-medicated female BPD patients found that compared to a group of women without BPD, those with borderline pathology showed greater reductions in endogenous opioid concentrations when presented with negative emotional stimuli (Prossin et al., 2010). This theory aligns with aforementioned biological perspectives linking childhood sexual abuse experiences to later opioid misuse. The amalgamation of evidence linking childhood sexual abuse to BPD, as well as that linking BPD to opioid misuse, led us to expect that borderline personality features would act as a mediator in the association between childhood sexual abuse and opioid misuse. The current study evaluated specific borderline features, as well as the total borderline features score as possible mediators.

**Purpose and Hypotheses**

We sampled women who had high-risk pregnancies due to opioid use, as well as women with high-risk pregnancies due to medical issues not related to drug use. We assessed BPD along a continuum of borderline features (negative relationships, identity disturbance, affective instability, and self-harm/impulsivity; Morey, 1991). We hypothesized the following: 1) women who reported histories of childhood sexual abuse would have higher total borderline features as well as higher scores for each borderline subscale (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity) when compared to women who did not report childhood sexual abuse; 2) borderline features (total, affective instability, identity disturbance, negative relationships, and self-harm/impulsivity) would mediate the association between sexual abuse and opioid use severity.
CHAPTER THREE: METHOD

Participants

We recruited a total of 93 women who were receiving prenatal treatment from a high-risk obstetrics clinic at a medical center in the Southeastern United States. Women from the clinic were eligible to participate if they were over 18 years of age, English-speaking, and in the second or third trimesters of their pregnancy. Of the 93 participants who enrolled in the study, 55 women had pregnancies classified as high-risk due to opioid misuse and 38 women had non-drug related high-risk pregnancies due to factors such as obesity, history of miscarriages, multiple births, heart disease, or rheumatologic diseases. All study procedures were approved by the medical center’s Institutional Review Board.

Procedures

During patient intake at the high-risk pregnancy clinic, a receptionist would ask potential participants if they were interested in taking part in a 30-minute study on high-risk pregnancies. If a patient expressed an interest in participating, she was directed by a hospital staff member to a private examination room before or after her appointment with her obstetrician/gynecologist, at which point a research assistant explained the study purpose and procedures and obtained her written consent to participate. Following informed consent, the research assistant administered written questionnaires. Participants received a $25 gift certificate as compensation for their time. After the participant had given birth to her infant, research team members obtained information from her medical chart regarding her demographic information, her history of opioid use, her current opioid use, and the gestational age of her infant at birth.
Measures

Demographic Variables

We gathered information regarding women’s race, ethnicity, employment status, relationship status, and gestational age at study participation from the participant’s medical chart (see Table 1). Medicaid enrollment was used as a proxy for (low) socioeconomic status. All women in the sample received Medicaid.

Childhood Sexual Abuse

The chronicity and severity of participants’ sexual abuse exposure was assessed using the sexual abuse subscale of the Maltreatment and Abuse Chronology of Exposure (MACE; Teicher & Parigger, 2015). The MACE is a 52-item questionnaire which uses continuous scales to assess for the presence and severity of maltreatment experiences during each year of childhood from ages 6 to 18. The sexual abuse subscale consisted of seven yes/no questions; scoring was based on both the characteristics of the person (i.e., exposure to sexual abuse) and the characteristics of the item (i.e., sexual abuse severity). Sexual abuse severity was calculated by the number of items endorsed out of seven, which was recalibrated to a total exposure severity level between 0 and 10.

The MACE showed good convergent validity with commonly used measures of trauma in childhood (Child Trauma Questionnaire, CTQ; Bernstein et al., 1994; Adverse Childhood Experiences, ACE; Dube et al., 2003), but was shown to account for 2.28-times more of the variance than CTQ scores and 2.04-times ACE scores for symptom ratings of depression, anxiety, somatization, dissociation, hostility/anger, and suicidal ideation (Teicher & Parigger, 2015). The MACE demonstrated excellent test–retest reliability across all ages ($r = .89$) and for
each specific age (reliability ranged from $r = .81$ at age 12 to $r = .90$ at age 16; Teicher & Parigger, 2015) and the subscales fit the model well, passing Andersen’s Likelihood ratio test.

In addition to the continuous childhood sexual abuse severity scale, we created a dichotomous childhood sexual abuse variable (yes/no). This dichotomous variable was used to evaluate group demographic differences and identify potential covariates for mediational analyses.

**Borderline Features**

The Personality Assessment Inventory Borderline Features Scale (PAI-BOR) is a self-report measure (Morey, 1991) that assesses BPD with 24 items across four features each with 6 items: affective instability (difficulty controlling mood, specifically anger); identity problems (intrapersonal instability lack of sense of self); negative relationships (intense and unstable interpersonal relationships); and self-harm/impulsivity (risky sexual behavior, non-suicidal self-injury, substance misuse, or suicidal behaviors). These four subscales are added together to create a total borderline features score. The PAI-BOR has been used to assess borderline features among adults diagnosed categorically with BPD and shows good test-retest reliability (Trull, 1995); in addition, the PAI-BOR shows high convergent validity with BPD diagnoses from structured interviews (Kurtz & Morey, 2001). Furthermore, the PAI-BOR and the diagnostic criteria for BPD laid out in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition are significantly related (Stein, et al., 2007). In the current sample, we measured internal reliability using Cronbach’s $\alpha$: affective instability, $\alpha = .81$; identity disturbance, $\alpha = .76$; negative relationships, $\alpha = .79$; self-harm/impulsivity, $\alpha = .79$; and total borderline features, $\alpha = .78$. 
Opioid Use Severity

We determined opioid use severity from participants’ medical records of urine assays conducted at clinic appointments, as well as prescribed medications for opioid misuse listed in the participant’s chart, within 30 days prior to study participation. Participants were given a score between 0 and 3 for opioid use severity.

Women were assigned a “0” for being “non-users” if they did not produce a positive sample for any drug (opioid or other drugs) and were not prescribed opioids at any medical appointments for 30 days prior to study participation (n = 38). Women were assigned a “1” to signify “opioid detoxification” if women produced urine samples negative for opioids and other drugs within the 30 days prior to participation but physicians had previously prescribed maintenance drugs such as buprenorphine, buprenorphine plus naloxone, or methadone (n = 4). An opioid severity score of “2” indicated “prescribed opioid use” for who produced a positive urine sample for prescribed opioid narcotics such as buprenorphine, buprenorphine plus naloxone, or methadone, but were not positive for other illicit drugs (n = 21). Finally, women were assigned a “3” for “non-prescribed opioid misuse” if women produced a positive urine sample within 30 days of study participation for prescription opioids which had not been prescribed to them by a physician (buprenorphine, buprenorphine plus naloxone, or methadone), or if women produced a urine sample with traces of illicit opioids, (n = 30). Data for six women were excluded from the sample because only drugs other than opioids were found in urine assays within the 30-day window (Kurdziel-Adams et al., 2020; Macfie et al., 2019).
Data Analytic Strategy

Before evaluating hypotheses, bivariate correlations were used to examine associations between all study variables. We tested for sexual abuse group differences in demographic variables such as maternal age, minority group status, employment status, and relationship status. Any demographic variables which were significantly different between groups and were significantly correlated with outcome variables were used as covariates in tests of hypotheses.

**Hypothesis 1.** A one-way ANOVA was used to evaluate the relationship between childhood sexual abuse and total borderline features, wherein childhood sexual abuse was entered as the independent variable and total borderline features was entered as the dependent variable. In order to assess associations between childhood sexual abuse and each individual borderline feature, we used a one-way MANOVA with childhood sexual abuse as the independent variable and each borderline feature (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity) entered as dependent variables.

**Hypothesis 2.** To test the proposed mediation models, we used the PROCESS macro version 3 (Hayes, 2018), for SPSS version 26 with the bootstrapping technique. Bootstrapping is a resampling procedure for mediation testing that involves random re-sampling from the current dataset and estimating the hypothesized indirect effect in each resampled data set. The bootstrapping method (Shrout & Bolger, 2002) has more power than traditional methods such as the causal steps regression approach (Baron & Kenny, 1986) and is thus useful for testing mediation models with smaller sample sizes (Koopman et al., 2015). Unlike for Baron and Kenny (1986) mediation, there is no requirement that there be a direct effect between the independent and dependent variables for mediation to occur, and because it is a nonparametric test it does not assume normal distributions (Hayes, 2009; Shrout & Bolger, 2002). Specifically,
we calculated a 95% confidence interval (CI) with 10,000 bootstrap resamples to determine if borderline features help explain the association between childhood sexual abuse and opioid use severity. Comparable to testing a null hypothesis, if zero does not fall within the 95% confidence interval, there is a 95% likelihood that the indirect effect is significant. Total borderline features, as well as each individual borderline feature (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity) were examined as five separate indirect effects in the association between childhood sexual abuse and opioid use. It is important to note that due to the cross-sectional design of the current study, our findings are presented and discussed as indirect effects rather than mediations.
CHAPTER FOUR: RESULTS

Preliminary Analyses

Demographic means, standard deviations, frequencies among women with and without childhood sexual abuse, and comparisons between groups are presented in Table 1. Women with sexual abuse histories were significantly older than were those without; age was therefore included as a covariate in subsequent analyses. Means and standard deviations for the primary study variables are presented in Table 2. Correlations among study variables are presented in Table 3. Childhood sexual abuse was significantly positively correlated with opioid misuse severity, total borderline features, as well as each borderline feature individually (affective instability, identity disturbance, negative relationships, and self-harm/impulsivity). Total borderline features, as well as each feature individually, were significantly positively correlated with opioid misuse severity with the exception of affective instability.

Childhood Sexual Abuse and Borderline Features

We conducted a one-way ANCOVA to test Hypothesis 1, that women who had experienced childhood sexual abuse would demonstrate higher total borderline features than would women without sexual abuse histories. We entered maternal age as a covariate; there was no significant main effect for age (p = .634). As hypothesized, there was a significant main effect for total borderline features wherein women with greater frequencies and severities of childhood sexual abuse had higher total borderline features, $F(1, 90) = 12.32, p = .001, \eta^2 = 0.12$.

We conducted a one-way MANCOVA to determine if women who had experienced childhood sexual abuse would have higher scores for affective instability, identity disturbance, negative relationships, and self-harm/impulsivity. There was an overall effect of sexual abuse on borderline features, Wilks’s $F(4, 87) = 3.31, p = .014, \eta^2 = 0.13$; we therefore proceeded to
investigate univariate associations. As hypothesized, women with greater frequencies and severities of childhood sexual abuse experiences had higher affective instability $F(1, 90) = 7.08$, $p = .009$, $\eta^2 = 0.07$ identity disturbance $F(1, 90) = 9.23$, $p = .003$, $\eta^2 = 0.09$, negative relationships $F(1, 90) = 12.63$, $p = .001$, $\eta^2 = 0.12$, and self-harm/impulsivity $F(1, 90) = 4.94$, $p = .029$, $\eta^2 = 0.05$.

**Borderline Features as an Indirect Effect**

We bootstrapped 10,000 re-samples from the current dataset to test whether total borderline features would mediate the association between women’s childhood sexual abuse severities and their opioid use severity during pregnancy, controlling for maternal age. In support of our hypothesis, the total of all borderline features was an indirect effect explaining the association between childhood sexual abuse severity and opioid use severity, $\beta = 0.06$, $SE = 0.02$, 95% CI [0.02, 0.11].

To test whether each individual borderline feature was an indirect effect in the association between childhood sexual abuse and opioid misuse (Hypothesis 2), we used the same PROCESS macro (Hayes, 2018) with 10,000 bootstrapped re-samples from the current dataset. Our hypothesis was supported with three out of the four borderline features: identity disturbance, negative relationships, and self-harm/impulsivity were all partial mediators between childhood sexual abuse and opioid misuse severity. Total borderline features was also a significant partial mediator (see Figure 1). Contrarily, affective instability did not indirectly link this association, 95% CI [-0.00, 0.07]. All indirect effects for Hypothesis 2 are found in Table 4.
CHAPTER FIVE: DISCUSSION

The current study adds to our understanding of the association between childhood sexual abuse and later opioid misuse during pregnancy through the investigation of borderline features as indirect effects. This study is the first to examine associations between childhood sexual abuse and borderline features in pregnancy, and is alongside one other study which investigated mediational models with opioid misuse in this population (Macfie et al., 2020).

We found that women with childhood sexual abuse histories had higher total borderline features. Upon further examination, we found that this link was present with all four borderline features: affective instability, identity disturbance, negative relationships, and self-harm/impulsivity. In addition, we tested mediational models which included total borderline features as an indirect effect between childhood sexual abuse and opioid misuse, as well as each individual borderline feature as separate mediators in that same association. We found that total borderline features, as well as identity disturbance, negative relationships, and self-harm/impulsivity were all significant indirect effects between childhood sexual abuse and opioid misuse; affective instability was the one borderline feature which did not show up as a significant mediator.

Among borderline features, self-harm/impulsivity and negative relationships may specifically help to explain the relationship between childhood sexual abuse and opioid misuse. Indeed, a previous study on the current sample found associations between the borderline features of self/harm impulsivity and negative relationships and increased opioid misuse, but not with identity disturbance nor affective instability (Kurdziel-Adams et al., 2019). Substance use researchers often discuss opioid misuse as a form of self-harm and link opioid misuse to impulsivity (Casillas & Clark, 2002; Evren & Bozkurt, 2016). In a sample of college students,
self-harm/impulsivity was significantly associated with more severe and frequent opioid misuse and greater risk for dependence (Tragesser et al., 2013). Links between self-harm/impulsivity have also been found for those with childhood sexual abuse histories (e.g., Maniglio, 2011). Theorists suggest that maladaptive emotion regulation strategies in the wake of sexual abuse lead to higher rates of self-mutilation (Bradley, 2018; Gladstone, 2004; Noll et al., 2003).

The experience of negative relationships is a borderline feature which may also link childhood sexual abuse to opioid misuse. Women with BPD tend to report having smaller social support networks, rate their relationships as less satisfying, and experience their relationships as more conflictual as compared to women without BPD diagnoses (Lazarus et al., 2016). In medical settings, healthcare workers have reported feeling less empathetic toward their patients with BPD (Markham, 2003). This phenomenon, coupled with the strong stigma placed against pregnant women who are misusing opioids (Holbrook, 2015; Howard, 2015; Stone, 2015; Towers et al., 2019), may make expectant mothers with opioid misuse and comorbid BPD even more sensitive to their negative interpersonal relationships, and may point to relational stability and social support as targets for intervention.

Negative relationships are also associated with childhood sexual abuse. In a community sample of non-treatment-seeking individuals, women were more likely than men to be motivated to misuse prescription opioids due to interpersonal distress (Back et al., 2010; Back et al., 2011), and in an epidemiological sample, women who were victims of intimate partner violence were more likely to misuse opioids as compared to their male counterparts (Smith et al., 2012). Further, literature examining the downstream effects of childhood sexual abuse has reported direct associations between childhood sexual abuse and lower relational quality in adulthood (Cherlin et al., 2004; Colman & Widom, 2004; Walker et al., 2009). Therefore, it is important to
determine whether women with negative relationships and childhood sexual abuse histories are more likely to misuse opioids during pregnancy.

Identity disturbance was also shown to be a significant mediator between childhood sexual abuse and opioid misuse. This finding is consistent with previous literature which has linked identity disturbance to sexual abuse experiences (e.g., Westen et al., 2011) and to opioid use (Reynolds et al., 2019; Tragesser et al., 2013). While previous studies have investigated these associations individually, ours is the first to have considered connections between sexual abuse, borderline features, and opioid misuse. It is important to note, however, that although sexual abuse is associated with identity disturbance, identity disturbance is not solely a response to trauma; studies have found that BPD symptoms account for unique variance in factors of identity disturbance beyond the contribution of abuse (Wilkinson-Ryan & Westen, 2000; Westen et al., 2011).

Literature suggests that severe disturbances in identity can lead to maladaptive behaviors such as drug use (Jørgensen, 2006, 2010). One study found that individuals with disturbed identity were at greater risk for opioid misuse and opioid use disorder symptomatology, even at below-average levels of impulsivity, suggesting that in some cases identity disturbance may be primary in the development of opioid misuse behaviors (Reynolds et al., 2019). Sexual abuse and borderline personality disorder are often linked phenotypically through the common experience of dissociation (Murray, 1993; Neumann et al., 1997), a psychological phenomenon which is commonly described as one form of identity disturbance (Wilkinson-Ryan & Westen, 2000). Individuals with borderline pathology may be prone to integrate their painful physical and psychological experiences into their identities instead of holding trauma separately from their self-conceptualizations (Reynolds et al., 2019). This fusion may make it difficult to employ
adaptive coping skills, such as psychological distancing (Liberman et al., 2007), when facing psychological distress, leading them to opt for opioids as a means of regulation, or even as a symbolic indicator of that identity (Reynolds et al., 2019; Adams et al., 2015). The loss of identity which ties childhood sexual abuse to borderline pathology may be the same psychological phenomenon that leads these individuals to misuse opioids later in life.

Affective instability has also been tied to opioid misuse, particularly in studies which have investigated individuals with BPD and comorbid chronic pain (Tragesser et al., 2010). One review indicated that negative affect was the strongest psychological correlate of opioid misuse when compared to other borderline features (Martel et al., 2018). Still, affective instability was not found to be a significant indirect effect between childhood sexual abuse and opioid misuse was affective instability. Given our small sample size and lack of longitudinal data, it could be that this effect does indeed exist but was undetectable in the current data.

**Limitations**

Findings should be considered in the context of the limitations of our study methodology. Despite participants’ retroactive reports of childhood sexual abuse, the cross-sectional design of the current study limited the power of our conclusions, specifically with the proposed mediational models. Given that our data derived from a single time point, we cannot conclude causation between our predictor, mediator, and outcome variables until future studies replicate these results longitudinally. Due to the dataset’s limited power each borderline subscale was run individually in study analyses; as a result, we were unable to correct for multiple comparisons. Future researchers who are working with larger samples may opt for running analyses with all of the variables in a single model in order to account for multiple comparisons. Moreover, the data collected to measure presence and severity of childhood sexual abuse was also based on
retrospective self-reporting; while participants’ perceptions of their experiences are certainly most relevant to the study findings, future studies may benefit from including objective reports of childhood sexual abuse such as police or child services reports in addition to participant accounts. Finally, our sample was demographically limited regarding race and income. Future research should replicate the current design with different demographic samples to test the generalizability of these findings.

**Clinical Implications**

Both childhood experiences of sexual abuse and subsequent borderline features may contribute to the development of opioid misuse and should be addressed in the formation of clinical interventions. Clinical treatments for substance dependency often over-emphasize behavioral symptoms while under-acknowledging the etiological causes of their drug use; attending therapeutically to opioid misuse, especially among pregnant women, must include a focus on maternal trauma history and the relational and representational sequelae of that trauma (Newman-Morris et al., 2020). One treatment focus which may be especially helpful for the current population is mentalization, or the capacity to understand one’s own or another’s mental states (Fonagy et al., 2002; Fonagy & Target, 1996). Mentalization-based therapy is affective in improving dyadic outcomes among mothers with substance use disorders (Suchman et al., 2010; Suchman, et al., 2017). Helping mothers gain insight into their own mental states as well as the emotional and cognitive catalysts to their behaviors has consistently been shown to promote secure infant attachment and reduce parenting stress, both of which are concerns with the current population (Fonagy et al., 2016; Macfie et al., 2020). In addition, mentalization-based treatments are often commonly incorporated in treatments for individuals with borderline personality disorder (e.g., Bateman & Fonagy, 2010), and have been shown to protect against child
maltreatment and the transmission of psychopathology (Newman-Morris et al., 2020). Future studies focused on treatment development for this population should employ both observational and representational measures to assess the efficacy of mentalization-based treatment on maternal and dyadic outcomes.

**Conclusions**

This study was the first to investigate childhood experiences of sexual abuse and borderline features in the context of opioid use during pregnancy. Findings from the current study suggest that women with histories of childhood sexual abuse may experience increased affective instability, identity disturbance, negative relationships, and self-harm/impulsivity. In addition, child sexual abuse survivors may be more likely to misuse opioids during adulthood, specifically during their pregnancies, if they also exhibit increased negative relationships, identity disturbance, and self-harm/impulsivity. Information gathered from this study can help inform preventative interventions targeting survivors of childhood sexual abuse who are at risk for developing borderline features and addictive behaviors.

**Compliance with Ethical Standards**

All procedures involving human participants were performed in accordance with the ethical guidelines of the institutional research board.

**Informed Consent**

Written consent was obtained from all research participants prior to study participation.

**Conflicts of Interest**

The author declares no conflicts of interest.
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APPENDIX
<table>
<thead>
<tr>
<th>Participant variable</th>
<th>Whole sample ((N = 93))</th>
<th>Childhood sexual abuse ((n = 35))</th>
<th>No childhood sexual abuse ((n = 58))</th>
<th>Childhood sexual abuse vs. No childhood sexual abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>(27.19 (4.26))</td>
<td>(28.33 (4.15))</td>
<td>(26.50 (4.21))</td>
<td>(-2.05^{*})</td>
</tr>
<tr>
<td>Gestation (weeks)</td>
<td>(26.81 (7.90))</td>
<td>(25.79 (9.12))</td>
<td>(27.45 (7.05))</td>
<td>(0.95)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>(83.87)</td>
<td>(97.10)</td>
<td>(75.90)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>(7.50)</td>
<td>(2.90)</td>
<td>(10.30)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>(2.20)</td>
<td>(0.00)</td>
<td>(3.40)</td>
<td></td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>(1.10)</td>
<td>(0.00)</td>
<td>(1.70)</td>
<td></td>
</tr>
<tr>
<td>Multiracial</td>
<td>(2.20)</td>
<td>(0.00)</td>
<td>(3.40)</td>
<td></td>
</tr>
<tr>
<td>Not Specified</td>
<td>(3.20)</td>
<td>(0.00)</td>
<td>(5.20)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>(17.00)</td>
<td>(17.10)</td>
<td>(17.20)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Has partner</td>
<td>(38.00)</td>
<td>(37.10)</td>
<td>(37.90)</td>
<td>(0.01)</td>
</tr>
</tbody>
</table>

\(^{*} p < .05\)
Table 2. Means and Standard Deviations of Key Study Variables.

<table>
<thead>
<tr>
<th></th>
<th>Whole sample (N = 93)</th>
<th>Childhood sexual abuse (n = 35)</th>
<th>No childhood sexual abuse (n = 58)</th>
<th>Childhood sexual abuse vs. No childhood sexual abuse (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Sexual Abuse</td>
<td>1.87 (2.82)</td>
<td>4.97 (2.37)</td>
<td>0.00 (0.00)</td>
<td>-16.03***</td>
</tr>
<tr>
<td>Total Borderline Features</td>
<td>31.95 (13.89)</td>
<td>37.77 (10.82)</td>
<td>28.43 (14.43)</td>
<td>-3.31**</td>
</tr>
<tr>
<td>Affective Instability</td>
<td>8.52 (4.26)</td>
<td>9.77 (3.57)</td>
<td>7.76 (4.50)</td>
<td>-2.25*</td>
</tr>
<tr>
<td>Identity Disturbance</td>
<td>8.87 (4.18)</td>
<td>10.31 (3.59)</td>
<td>8.00 (4.30)</td>
<td>-2.67**</td>
</tr>
<tr>
<td>Negative Relationships</td>
<td>9.83 (4.18)</td>
<td>11.74 (3.08)</td>
<td>8.67 (4.36)</td>
<td>-3.65***</td>
</tr>
<tr>
<td>Self-Harm/Impulsivity</td>
<td>4.73 (4.13)</td>
<td>5.94 (4.01)</td>
<td>4.00 (4.07)</td>
<td>-2.24*</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001
Table 3. Correlations Among Study Variables.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Childhood sexual abuse severity</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Total borderline features</td>
<td>.35**</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Affective instability</td>
<td>.29**</td>
<td>.84**</td>
<td>--</td>
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<td></td>
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<tr>
<td>4. Identity disturbance</td>
<td>.28**</td>
<td>.86**</td>
<td>.62**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Negative relationships</td>
<td>.39**</td>
<td>.85**</td>
<td>.66**</td>
<td>.69**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>6. Self-harm/impulsivity</td>
<td>.21**</td>
<td>.76**</td>
<td>.51**</td>
<td>.54**</td>
<td>.47**</td>
<td>--</td>
</tr>
<tr>
<td>7. Opioid misuse severity</td>
<td>.27**</td>
<td>.34**</td>
<td>.19</td>
<td>.23*</td>
<td>.36**</td>
<td>.34**</td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01
Table 4. *Indirect Effects of Borderline Features between CSA and Opioid Use Severity, N = 93.*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Borderline Feature</th>
<th>Effect of childhood sexual abuse on borderline features (Path A)</th>
<th>Effect of borderline features on opioid use severity (Path B)</th>
<th>Effect of childhood sexual abuse on opioid use severity (Path C)</th>
<th>Bootstrap indirect effect (Path C’)</th>
<th>Bootstrap 95% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA</td>
<td>Total</td>
<td>1.84***</td>
<td>0.03**</td>
<td>0.05</td>
<td>0.06 (0.02)‡</td>
<td>[0.02, 0.11]</td>
</tr>
<tr>
<td>CSA</td>
<td>Affective Instability</td>
<td>0.49**</td>
<td>0.06</td>
<td>0.07</td>
<td>0.03 (0.02)</td>
<td>[-0.00, 0.07]</td>
</tr>
<tr>
<td>CSA</td>
<td>Identity Disturbance</td>
<td>0.46**</td>
<td>0.07*</td>
<td>0.07</td>
<td>0.03 (0.02)‡</td>
<td>[0.00, 0.08]</td>
</tr>
<tr>
<td>CSA</td>
<td>Negative Relationships</td>
<td>0.58***</td>
<td>0.10**</td>
<td>0.05</td>
<td>0.06 (0.02)‡</td>
<td>[0.01, 0.11]</td>
</tr>
<tr>
<td>CSA</td>
<td>Self-Harm/Impulsivity</td>
<td>0.31*</td>
<td>0.09**</td>
<td>0.07</td>
<td>0.03 (0.02)‡</td>
<td>[0.00, 0.08]</td>
</tr>
</tbody>
</table>

Note. Regression coefficients for all paths adjusted for maternal age covariate; a value of 0.00 indicates above zero if taken to additional decimal places; a value of −0.00 indicates below zero.

* p < .05, ** p < .01, *** p < .001, ‡ significant for 95% confidence interval (when lower and upper confidence intervals do not contain zero).
Figure 1. Total borderline features are an indirect effect in the association between childhood sexual abuse and opioid misuse.

*p < .05, **p < .01, ***p < .001, †significant for 95% confidence interval (when lower and upper confidence intervals do not contain zero).
VITA

Chloe Tess Cohen graduated from Pitzer College, a member of the Claremont Colleges, in 2017 where she earned a Bachelor of Arts degree in Psychology, with a minor in Biology. Chloe was admitted to the doctoral program in Clinical Psychology at the University of Tennessee in 2019. She anticipates earning her Master of Arts degree from the University of Tennessee in December 2020 and her doctoral degree in 2025.