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Contextual Influences on the Perception of Pregnant Women Who Use Drugs: Information about
Women's Childhood Trauma History Reduces Punitive Attitudes

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Abstract

Punitive attitudes and consequences (e.g., incarceration) for prenatal illicit drug use persist in the United States despite evidence that these policies are ineffective and even harmful to women and children. For instance, the threat of these consequences can deter women from seeking healthcare, prenatal care, and drug treatment. Punitive responses may persist due to pejorative public perceptions of pregnant women who use illicit drugs. Although there is evidence that contextual information about prenatal drug use (e.g., drug type) can change such perceptions, other contextual influences are unknown. This experimental study tested whether receiving contextual information about a pregnant woman who uses drugs (specifically, her childhood trauma history) reduces punitive and increases supportive attitudes toward the woman. In a vignette-based 2(*pregnancy status*: pregnant/not pregnant) x 2(*history of childhood trauma*: interpersonal/non-interpersonal) between-subjects design, young adult university participants ($N=461$) were randomly assigned to read a vignette about a woman who uses methamphetamine. Punitive attitudes were significantly reduced by information that the pregnant woman had a history of childhood trauma, especially interpersonal (versus non-interpersonal) trauma ($\eta_p^2=.115$). Supportive attitudes were not impacted ($\eta_p^2=.005$). Information about the pregnant woman's trauma history predicted less agreement with incarcerating her, only indirectly, through less punitive attitudes ($R^2=.21$). Reductions in punitive attitudes were on the order of 1.5-2 points on 5-point self-report scales and controlled for participant gender and political conservatism. Results have practical implications for interdisciplinary work aimed at unlocking greater support for policies that help pregnant women make safe, informed decisions with dignity and access to healthcare.

Contextual Influences on the Perception of Pregnant Women Who Use Drugs: Information about Women's Childhood Trauma History Reduces Punitive Attitudes

In the United States, punitive responses to women's use of drugs in pregnancy continue to be a highly controversial topic of public debate, with the potential for maternal arrest, criminal prosecution, and termination of parental rights (Hui, Angelotta, & Fisher, 2017). These policies vary by state and disproportionately target and affect marginalized, low-income women and women of color, despite the fact that past-month illicit drug use by White, Black, and Hispanic women in metropolitan areas is roughly equivalent at 8.6%, 8.4%, and 5.6%, respectively (Flavin & Paltrow, 2010; Guttmacher Institute, 2016; Paltrow & Flavin, 2013; Roberts & Nuru-Jeter, 2012). Punitive policies are not only ineffective in reducing rates of prenatal exposure, but can be harmful to maternal, fetal, and infant health (Flavin & Paltrow, 2010). For instance, these responses can drive women away from seeking prenatal and postpartum care, reduce trust in healthcare providers, and disrupt mother-infant bonding when birth mothers are incarcerated (Alexander, 2015; Poland, Dombrowski, Ager, & Sokol, 1993). When women with young children are incarcerated, their children are far more likely to be placed in foster care than with the other parent (who is also likely to be incarcerated), contributing to family hardship and separation (Goshin, Arditti, Dallaire, & Shlafer, 2017). Additionally, many helping professionals who wish to support pregnant women are placed in the adversarial position of being mandatory reporters. Taken together, empirical work suggests that punitive responses to maternal drug use fall short of their stated aims.

As such, more effective responses to maternal drug use are urgently needed, part of a common goal among health professionals, policy makers, and many parents to decrease or eliminate the use of drugs during pregnancy. Opinions vary on desirable alternatives to a

punitive response. The American College of Obstetricians and Gynecologists (ACOG) states that referral to addiction treatment programs rather than incarceration or the threat of incarceration are recommended (ACOG, 2011, 2018). Other advocates argue that mandated referrals can be a coercive response that has similarities to incarceration, in that addiction treatment may not be medically necessary in every case and that mothers may be separated from their children (the majority of treatment programs in the U.S. are not specialized to serve pregnant/parenting women and do not include children in services; Guttmacher Institute, 2016). A harm reduction approach that advocates providing women with access to systems of psychosocial support to help them reduce harm and stop using substances has also been suggested (Van Scoyoc, Harrison, & Fisher, 2017).

Distracting from the pursuit of effective alternatives to punishment, public perception often reflects the belief that women who continue to use illicit drugs during pregnancy do not care about the welfare of the baby (Toscano, 2005). This pejorative narrative fails to reflect the lived circumstances of many pregnant women who use drugs (e.g., social inequality, a history of trauma perpetrated within close relationships). Although pejorative perceptions of pregnant women who use substances are well-documented and there is evidence that contextual information about drug use (e.g., drug type; Miller & Thomas, 2015) can change such perceptions, other contextual influences remain largely unknown. In this vignette-based experimental study, we examine the extent to which providing information about pregnant women's history of childhood trauma reduces endorsement of punitive attitudes and enhances helping attitudes toward pregnant women who use drugs.

Impact of Prenatal Illicit Drug Exposure on Fetal and Infant Development is Difficult to Disentangle from Co-occurring Forms of Adversity

Community response to pregnant women's drug use requires balancing the needs of the woman with the needs of the unborn child. With respect to the impact of prenatal drug use on fetal and infant development, these consequences depend on drug type and on quantity, frequency, and gestational timing of exposure (Shankaran et al., 2004). In general, the most harmful (teratogenic) effects occur during the embryonic stage of fetal development, when major structural developments occur (Behnke & Smith, 2013). Alcohol is arguably the most teratogenic drug and the only drug for which prenatal exposure can result in a distinct diagnostic condition, Fetal Alcohol Spectrum Disorder (Astley, 2011). For prenatal methamphetamine and cocaine exposure, fetal growth restriction and disruptions in neonatal neurobehavior (e.g., increased stress, decreased arousal) are the most robust findings (Smith et al., 2008), although it is important to note that research in this area is ongoing.

A methodological challenge to isolating the developmental impact of a given drug is that most prenatal drug exposure involves exposure to multiple substances (Lester, Andreozzi, & Appiah, 2004). Overall, the effects of prenatal *illicit* drug exposure, the focus of this study, are difficult to disentangle from the potentially harmful effects of socioeconomic disadvantage, tobacco use, and other stressors to mother-child health that tend to co-occur with prenatal illicit drug use (Messinger & Lester, 2005). For instance, both maternal prenatal undernutrition (Barker, 2004) and lack of access to prenatal care (Andrulis, 1998) are associated with negative short- and long-term child developmental outcomes. Moreover, prenatal maternal drug use is associated with postnatal drug use and increased risk for child abuse and neglect, amplifying any adverse developmental impact of prenatal exposure (Fisher, Leve, Delker, Roos, & Cooper, 2015). Nevertheless, public discourse about pregnant women who use drugs continues to

emphasize the specific harmfulness of illicit drugs to the fetus without adequate attention to co-occurring contextual risk factors.

Addressing the Needs of Pregnant Women who Use Illicit Drugs and Their Families

Requires Placing Prenatal Drug Use in its Social and Developmental Context

Dating to the U.S. crack cocaine crisis of the 1980s and early 1990s, there is a legacy of sensational media coverage and public discourse on pregnant women who use drugs as “monstrous” mothers who willfully harm their children (Gubrium, 2008, p. 512). This sensational portrayal emphasizes individual maternal responsibility for fetal harm, overlooking social contexts that contribute to maternal drug use and addiction, along with areas of collective social and political responsibility for women’s reproductive health (Toscano, 2005). Pregnant women who continue to use drugs after they learn of their pregnancies have experienced high rates of early and ongoing adversity, particularly interpersonal trauma. In a sample of 2,746 women in federally-funded residential addiction treatment programs for pregnant and parenting women, mostly African-American and White, more than half (57.4%) reported a history of abuse by a parent in childhood (Conners et al., 2004). Among 715 pregnant women, majority African-American, enrolled in a perinatal addiction treatment program, 44.5% reported a lifetime history of sexual abuse, 72.7% physical abuse, 71.3% emotional abuse, and one third (35.8%) reported all three types of abuse (Velez et al., 2006). Rates of posttraumatic stress disorder (PTSD) are as high as 78% among women in perinatal addiction treatment (Fitzsimons, Tuten, Vaidya, & Jones, 2007; by comparison, national lifetime prevalence estimates for PTSD are 7.8%, Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

To the extent that drugs are used to cope with posttraumatic distress (Delker & Freyd, 2014; Ullman, Relyea, Peter-Hagene, & Vasquez, 2013), quitting drug use without access to

comprehensive, integrative trauma and addiction recovery options may be particularly difficult. Moreover, the intergenerational cycle of family trauma underscores the importance of a relational approach to treatment that supports relationships between the pregnant/parenting woman and her children and service providers (Andrews, Motz, Pepler, Jeong, & Khoury, 2018). Such a relationship-focused approach to treatment of mothers with substance use issues has been associated with better substance-related and parenting-related outcomes (e.g., more likely to have custody of the child) compared to treatment as usual (Andrews et al., 2018). Of course, women who struggle with substances deserve to be treated humanely because they are human beings, not solely because they are mothers or they are likely to have histories of abuse and trauma. Equally, no one should be obliged to open their childhood wounds to the public in order to earn basic human rights such as dignity and health. But as demonstrated here, addressing the needs of this vulnerable, stigmatized population requires understanding and addressing the social and developmental context for prenatal substance use.

Contextual Information about Type and Timing of Prenatal Drug Use Impacts Judgments about the Appropriate Societal Response to Drug Use

Why do perceptions about the causes and developmental consequences of pregnant women's drug use matter? Studies of public opinion and laboratory-based experimental research each suggest that contextual information about drug use (e.g., how, what, when, why) impacts judgments about the appropriate response to drug use (e.g., punitive versus rehabilitative or supportive). For instance, an experimental study found that if a pregnant woman used methamphetamine during pregnancy (versus cocaine, marijuana, alcohol, or cigarettes), respondents endorsed significantly more agreement with giving the woman a prison sentence and placing the child in foster care after birth (Miller & Thomas, 2015). Interestingly, the

recommendations that pregnant women receive a prison sentence (a punitive response) and be committed to a hospital (a rehabilitative, although still coercive, response) were not mutually exclusive. Respondents endorsed more agreement with committing a pregnant woman to a “rehabilitation hospital” if she used methamphetamine (versus other drugs) and if she did not stop drug use by five months of pregnancy (Miller & Thomas, 2015, p. 119). Convergent research on public opinion has found that perceptions that people with addiction are responsible for and in control of their addiction are associated with endorsement of the belief that people with addiction should be forbidden to take care of their children, a punitive response (van Boekel, Brouwers, van Weeghel, & Garretsen, 2013). In general, when individual, internal attributions for wrongdoing (e.g., “crime is a choice”) are emphasized relative to external attributions (e.g., “crime is mostly a product of a person’s social circumstances and social contexts”), people are more likely to support punishment rather than rehabilitation for offenders (Templeton & Hartnagel, 2012, p. 51). Beyond the role of contextual information about drug use, little is known about additional contextual influences on perceptions of pregnant women who use illicit drugs.

The Current Study

The main goal of the current study was to examine whether providing information about the developmental history of pregnant women who use drugs reduces punitive attitudes toward prenatal drug use and enhances helping, health-promoting attitudes. We focused particularly on maternal history of childhood trauma within close relationships. The prevalence of childhood trauma among pregnant women with addiction is under-acknowledged in media portrayals, where the public may develop its assumptions about pregnant women who use illicit drugs. Furthermore, the role of childhood trauma in the etiology of addiction is increasingly supported

by empirical evidence (Cross, Crow, Powers, & Bradley, 2015; Torchalla, Linden, Strehlau, Neilson, & Krausz, 2014; Wu, Schairer, Dellor, & Grella, 2010). We focused on methamphetamine as the illicit drug in question due to the sensational nature of its depiction in news media and its prevalence as a drug of abuse among women in federally funded drug treatment programs (Good, Solt, Acuna, Rotmensch, & Kim, 2010; Terplan, Smith, Kozloski, & Pollack, 2009).

Consistent with prior experimental research on attitudes toward drug use in pregnancy (Miller & Thomas, 2015), participants were asked to read a brief vignette about a woman who uses methamphetamine and then respond to questions assessing “punishing” versus “helping” attitudes toward the woman (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003, p. 165). Keeping the majority of the vignette content constant, we changed key details about the woman across different versions of the vignette, namely her: (a) pregnancy status (pregnant, not pregnant), and (b) history of childhood trauma (interpersonal, non-interpersonal). We hypothesized that when a pregnant woman who uses methamphetamine is described as having a history of childhood interpersonal trauma, respondents would report: (a) lower punitive attitudes toward the woman; (b) greater supportive/helping attitudes toward the woman; and (c) less agreement with a punitive consequence for the woman, incarceration. We also hypothesized that attitudes toward the pregnant woman that uses methamphetamine would mediate the association between maternal trauma history and less agreement with incarcerating the woman. Finally, we controlled for respondents’ social desirability response bias, political conservatism, and own childhood abuse history.

Method

Participants and Procedure

This survey-based, online study was implemented at a large, public university in the northwestern United States with approval and monitoring by the institution's Research Compliance Services organization. Participants were recruited via a university-based online research management system; signed up for this study based on schedule availability, without knowledge of study content; and received course credit for their participation, on Qualtrics.com. After enrollment and electronic informed consent, participants were randomly assigned to read one of five vignettes and then to complete questionnaires. Intended study sample size was determined by an analysis conducted with G*Power 3.1. The final analytic sample ($N = 461$) excluded data of 37 participants who did not pass our empirically-supported data quality assurance checks (Meade & Craig, 2012). Demographic characteristics of these 37 participants were equivalent to the demographic characteristics of the final analytic sample, described below.

The 461 participants were mostly female (71.6%) and college-aged ($M = 20.35$, $SD = 4.32$), reflecting the demographics of the human subjects pool. Participants' race was reported as follows: 67.5% White or European-American; 16.1% Asian; 2% Native Hawaiian or Other Pacific Islander; 2.2% Black or African-American; 0.7% American Indian or Alaska Native; and 11.7% Multiracial. About 10% of the sample self-identified as Hispanic or Latino/a.

Manipulation and Measures

Vignettes. Participants were randomly assigned to read one of five vignettes (see Appendix) describing a woman named Nia, who has used methamphetamine for the past five years. Details about Nia's substance use were based on relevant clinical experiences of the first two authors, and the second author's qualitative research with pregnant women in addiction treatment (Van Scoyoc et al., 2017). Using lay language, each vignette described Nia's physical dependence on methamphetamine. As polydrug use among pregnant women who use

methamphetamine is common (Arria et al., 2006), the vignette stated that if Nia did not have methamphetamine at home, she would “smoke cigarettes or marijuana to hold her over until she can obtain more” methamphetamine.

In this 2x2 design, each vignette contained this same basic information about Nia’s substance use, but differed according to two between-subjects factors: pregnancy (pregnant vs. non-pregnant) and maternal childhood trauma history (interpersonal vs. non-interpersonal trauma history). A fifth control vignette featured a pregnant Nia with no information about childhood history. In the interpersonal trauma vignettes, child Nia experienced physical and sexual abuse by her step-father, along with family betrayal (“When she tried to tell her mother about the abuse, her mother did not believe her”), a common feature of childhood trauma (Delker, Rosenthal, Smith, Bernstein, & Freyd, 2018). In the non-interpersonal trauma vignettes, child Nia was a passenger in a car involved in a vehicle collision. Each vignette was about 200 words in length. Manipulation check questions were included after each vignette.

Perceptions of the vignette woman’s substance use. After reading a vignette, participants rated their degree of agreement with statements tapping into supportive/helping and punitive attitudes toward the woman who uses drugs, on a five-point scale from *strongly disagree* (1) to *strongly agree* (5). Items were generated by the first two authors based on research on perceptions of stigmatized populations (Bloom & Farragher, 2013; see Table 1 and Supplementary Materials). Responses to these items were clustered into 2 subscales: *supportive attitudes* ($\alpha = .75$, n of items = 7) and *punitive attitudes* ($\alpha = .78$, n of items = 6) based on a confirmatory factor analysis limited to the control condition. Correlation between the subscales was in the expected direction, $r(461) = -0.15$, $p = .001$.

In addition, using the same five-point response scale as above, participants who read a vignette in which Nia was pregnant were asked to rate their degree of agreement with a specific punitive consequence: “A prison sentence for Nia will help protect her baby from harm.”

Social desirability bias. As illicit drug use is a socially stigmatized and undesirable behavior, we assessed participants’ social desirability response bias with a brief, 8-item version of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlow, 1960). Response options are *true* or *false*, with four reverse-scored items; higher scores indicate higher levels of socially desirable responding. Internal consistency reliability of items was adequate ($\alpha = .50$).

Political conservatism. This covariate was assessed with a single item, “On most political matters, where on the following spectrum do you consider yourself?” with a 7-point Likert-type scale from *very liberal* (1) to *very conservative* (7). Higher scores indicate greater political conservatism. On average, participants in this sample were *slightly liberal*, with a range from *very liberal* to *very conservative*.

Childhood abuse history of study participants. History of participant exposure to physical, sexual, and psychological abuse within childhood close relationships was assessed with the Brief Betrayal Trauma Survey (BBTS; Goldberg & Freyd, 2006). Items assessing potentially traumatic events before age 18 perpetrated by someone very close were summed to create childhood abuse index, used as a control variable in analyses. Internal consistency reliability of items was excellent ($\alpha = .91$).

Analysis Plan

Statistical analysis was conducted with SPSS Statistics Version 23 and Hayes’ PROCESS macro for SPSS version 2.16.1 (Hayes, 2013). For clarity of data presentation, several graphs

were obtained in R (R Core Team, 2017) with the “tidyverse” package for RStudio (Wickham, 2017).

Data analysis proceeded in three phases. In the first phase, we cleaned and visually inspected the data using standard procedures (see Supplemental Materials). Of note, participants assigned to each of the five vignette conditions did not differ significantly on political affiliation, personal childhood abuse history, or any demographic characteristic (e.g., race, sex).

In the second phase of data analysis, two between-subjects factorial ANOVAs tested the effect of information about a woman’s pregnancy status and childhood trauma history on punitive and supportive attitudes toward the woman.

The final question to be addressed was whether information about pregnant women’s developmental history impacts participants’ *endorsement of incarceration*, a real-world punitive consequence for pregnant women’s illicit drug use. As such, the third phase of data analysis focused only on the three vignette conditions in which the woman was pregnant. We performed a mediation analysis to test whether information about the pregnant woman’s childhood trauma history (interpersonal, non-interpersonal, or no trauma information- the control condition) reduces agreement with incarcerating her for drug use *directly*, or *indirectly*, as a result of the reduced punitive attitudes and increased supportive attitudes. For more information about the Hayes and Preacher (2014) method for estimating direct and indirect effects that we used in this analysis, please see Supplementary Materials.

Results

Effects of Substance-Using Woman’s Pregnancy Status and Trauma History on Punitive Attitudes

The 2 X 2 between-subjects ANOVA revealed significant main effects of both pregnancy status (pregnant vs. non-pregnant woman) and childhood trauma history (interpersonal vs. non-interpersonal trauma) on participants' punitive attitudes toward Nia, the substance-using woman in the vignette (see Figure 1a). Participants reported significantly greater punitive attitudes toward Nia when she was a pregnant woman ($M = 16.76$, $SD = 3.98$) than when she was not pregnant ($M = 14.64$, $SD = 3.95$), $F(1,340) = 27.41$, $p < .001$, $\eta_p^2 = .075$.

In the focal test of our hypothesis, participants reported significantly *less* punitive attitudes toward Nia when she had a childhood history of interpersonal trauma perpetrated by close others ($M = 14.04$, $SD = 3.89$), than when she had a childhood history of non-interpersonal trauma ($M = 16.83$, $SD = 3.85$), $F(1,340) = 44.26$, $p < .001$, $\eta_p^2 = .115$. This was the case regardless of whether Nia was pregnant; the interaction between Nia's pregnancy status and trauma history did not significantly predict punitive attitudes, $F(1,340) = 2.78$, $p = .096$, $\eta_p^2 = .008$. As such, our hypothesis that information about the pregnant woman's childhood trauma history would reduce punitive attitudes toward her drug use was supported. Regarding covariates, participants' political conservatism was also a strong predictor of more punitive attitudes toward Nia, holding constant Nia's pregnancy status and trauma history, $F(1,340) = 41.11$, $p < .001$, $\eta_p^2 = .108$, $B = 0.76$ ($SE = 0.12$), 95% CI [0.52, 0.99]. Scores on the Marlowe-Crowne Social Desirability Scale also predicted more punitive attitudes toward Nia, $F(1,340) = 7.58$, $p = .006$, $\eta_p^2 = .022$, $B = 0.33$ ($SE = 0.12$), 95% CI [0.10, 0.57]. Participants' own personal history of abuse perpetrated by someone very close in childhood was not a significant predictor of punitive attitudes.

Effects of Substance-Using Woman's Pregnancy Status and Trauma History on Supportive Attitudes

There were no significant main or interactive effects of pregnancy status, $F(1,340) = 0.76, p = .383, \eta_p^2 = .002$, nor childhood trauma history, $F(1,340) = 1.67, p = .197, \eta_p^2 = .005$, on participants' supportive/helping attitudes toward Nia (see Figure 1b). The only significant predictors of punitive attitudes were the sociodemographic control variables. Holding experimental condition constant, the more politically conservative that participants were, the less supportive their attitudes toward Nia, $F(1,340) = 4.25, p = .040, \eta_p^2 = .012, B = -0.23$ ($SE = 0.11$), 95% CI [-0.45, -0.01]. Finally, female participants reported more supportive attitudes than male participants toward Nia, holding condition constant, $F(1,340) = 8.21, p = .004, \eta_p^2 = .024$.

Knowledge of Pregnant Woman's Trauma History Reduces Agreement with Incarcerating Her for Substance Use, via Less Punitive Attitudes

Table 2 and Figure 2 summarize the results of a mediation analysis predicting agreement with incarcerating a pregnant woman, Nia, for her substance use. In summary, participants who read a vignette in which the pregnant woman had a childhood trauma history (versus no trauma history information) reported *less* agreement with giving the woman a prison sentence for her drug use. Moreover, participants who read a vignette in which the pregnant woman had a childhood *interpersonal* trauma history (versus a *non-interpersonal* trauma history) reported even less agreement with giving the woman a prison sentence. The impact of information about the pregnant woman's history on reduced agreement with incarcerating her was a result of trauma history information *reducing participants' punitive attitudes toward the woman* (see Table 2 and Figure 2). Thus, it was not simply information about the pregnant woman's developmental history that reduced participants' agreement with incarcerating her for substance use. Rather, this effect was mediated through a change in participants' attitudes.

When participants were assigned to either of the childhood trauma history vignettes, their punitive attitudes toward the pregnant woman were on average 1.5 points less than the participants who were assigned to the control vignette ($a_{12} = -1.50$). Punitive attitudes were even lower (by about 2 points) when participants were assigned to the vignette where Nia had an interpersonal trauma history where trauma was perpetrated by someone very close, vs. a non-interpersonal trauma history ($a_{22} = -1.99$). In turn, the lower one's punitive attitudes, the less one's agreement with giving the pregnant woman a prison sentence for her substance use (see bolded lines in Figure 2). Controlling for all covariates, participants, on average, disagreed moderately (between *disagree* and *strongly disagree*) with giving the pregnant woman a prison sentence; disagreement became stronger as a function of the vignette woman's trauma history and of participants' punitive attitudes. Although supportive attitudes toward the pregnant woman predicted less agreement with incarcerating her ($b_1 = -0.05$), supportive attitudes were not impacted at all by reading the vignettes.

This model controlled for the effects of sociodemographic control variables used throughout this study's analyses: political conservatism predicted more punitive and less supportive attitudes toward the pregnant woman, and females reported significantly more supportive attitudes toward the pregnant woman than did males. Participants' social desirability bias scores did not predict either punitive attitudes nor agreement with a prison sentence, though it should be noted that the social desirability bias items had only adequate internal consistency.

Regarding effect size, the overall model explained 21.4% of the variance in agreement that the pregnant woman should get a prison sentence, $R^2 = .21$, $F(7, 272) = 10.59$, $p < .001$.

Discussion

There is no evidence that punitive consequences for prenatal drug use (e.g., incarceration) have reduced rates of drug use by pregnant women or lead to healthier pregnancies. Although complex in origin, punitive attitudes toward prenatal drug use may, in part, reflect a lack of understanding of the lived circumstances of many pregnant women who use drugs. The aim of this study was to test whether providing information about the social and developmental context of pregnant women's substance use (specifically, the finding that many women have a history of victimization by close others in childhood) decreases punitive attitudes and increases helping attitudes toward a pregnant woman who uses methamphetamine and other drugs.

In this study, attitudes toward women who use methamphetamine were both more supportive and less punitive than would be expected based on U.S. policy. On average, regardless of the woman's pregnancy status or childhood trauma history, participants reported a high degree of supportive attitudes: they *agreed* or *strongly agreed* on average with all support items, such as that the woman in the vignette should receive addiction treatment and access to resources. Consistent with experimental research in this area by Miller and Thomas (2015), this suggests that there is a disconnect between general public support for increased helping responses to support women with addiction, and public policy, which is increasingly punitive (Hui et al., 2017). On average, participants were neutral to low in their punitive attitudes toward the methamphetamine-using woman in the vignette. This is surprising given how vocal supporters of punitive policies are and how widespread punitive policies are in many states. It is possible that college students in the Northwest are more liberal than the U.S. population overall (this sample described themselves as *slightly liberal* on average) and if the study were conducted elsewhere, average punitive attitudes would have been consistent with general U.S. policy.

Perhaps most importantly, in this study punitive (but not supportive) attitudes were impacted by presenting information about the pregnant woman's childhood trauma history. Punitive attitudes toward the methamphetamine-using pregnant woman in the vignette were significantly lower when the woman had a history of childhood interpersonal (vs. non-interpersonal) trauma. This was the case regardless of participants' own personal history of trauma and their degree of political liberalism/conservatism. This causal effect has important implications for intervention on attitudes toward prenatal drug use. It suggests that reducing punitive attitudes toward women who use drugs in pregnancy would be a more effective intervention target than attempting to increase helping attitudes, which did not change in response to contextual information. Reductions in punitive attitudes as a result of reading about the woman's trauma history were on the order of one and a half to two points on five-point self-report scales. This change is noteworthy. In less time than it would take to read a news story, participants' attitudes shifted significantly toward a woman engaged in a highly stigmatized behavior. This creates optimism for the potential that more immersive portrayals of substance-using pregnant women's developmental history in politics and the media may lead to an even greater shift in punitive attitudes. It is possible that decreased punitive attitudes that are judging and blaming represents greater understanding of women's behavior and therefore greater empathy.

Beyond attitudes toward pregnant women who use methamphetamine, this study assessed the effect of trauma history information on agreement with a punitive legal consequence for prenatal drug use: a prison sentence for the pregnant woman. Critically, information about a pregnant woman's childhood trauma history predicted less agreement with incarcerating her as a consequence for prenatal drug use, by way of reduced punitive attitudes toward the pregnant

woman with any history of childhood trauma, especially the woman with a history of interpersonal (vs. non-interpersonal) trauma. Importantly, this finding was *not* explained by participants' political beliefs. This finding provides crucial support for the hypothesis that awareness of the social and developmental context of pregnant women's substance use will reduce agreement, at least temporarily, with a punitive legal consequence for prenatal substance use. Interestingly, although greater supportive attitudes predicted less agreement with a prison sentence for the woman, supportive attitudes were not influenced by trauma history information. Rather, supportive attitudes were connected to participants' relatively stable sociodemographic characteristics: female gender identity and (lower) political conservatism. It is possible that female gender socialization around being of help and service to others is so salient that contextual information will not meaningfully increase women's supportive attitudes.

Practical Implications

The threat of punitive consequences for women's drug use during pregnancy (e.g., arrest, incarceration, termination of parental rights) can deter pregnant women from seeking healthcare, prenatal care, and drug treatment, a violation of their right to health. Despite this, there is sustained political momentum in the U.S. for punitive legislation targeting pregnant women (Goodwin, 2014). In January and February of 2017 alone, 17 state legislatures introduced laws that criminalize pregnant women for their use of drugs, such as "fetal assault" laws that define fetuses as victims of crime and women as perpetrators (Amnesty International, 2017). The perception of pregnant women's drug use as a criminal issue has direct practical implications for the public policy and laws that are enacted in this domain. If prenatal drug use is attributed to women's perceived moral failings and criminality, punishment is a logical response, with the criminal justice system as a major site of intervention. But if prenatal drug dependence is

inextricably tied to women's experiences of marginalization and harm within close relationships, then it is easier to recognize our collective responsibility to both intervene on the source of those relational harms, and to address the effects of those harms on women's lives (vis-à-vis holding them accountable for prenatal drug use *and* helping them to change by addressing both addiction and trauma recovery, if relevant).

This "both/and" perspective is worth highlighting. We do not want to present a simplified, moralizing dichotomy in which pregnant women who use drugs are either victimizers (of their fetus/child) or victims (of their trauma histories or circumstances). Nor do we want to promote the argument that people who have been victimized in their lives are not responsible for harm that they do to others. Rather, pregnant women who use drugs often have been injured in early, ongoing ways within a societal context that diminishes the status of women and children within family relationships. These gender-based inequalities are compounded by socioeconomic inequality, racial discrimination in the enforcement of laws regulating women's reproduction, and racial disparities in women's access to healthcare (Center for Reproductive Rights, 2018; Kunins, Bellin, Chazotte, Du, & Arnsten, 2007). Just as women must be held accountable for actions that harm others, so must our government and society be accountable collectively for social contexts that contribute to intergenerational trauma, addiction, inadequate healthcare, and related injustices. Among the research and advocacy organizations that have published extensive, evidence-based recommendations for policy changes targeting these issues at local, state, tribal, and federal levels are Amnesty International (2017), the Black Mamas Matter Alliance (Center for Reproductive Rights, 2018), and the Women's Healthcare Physicians of the American College of Obstetricians and Gynecologists (ACOG), in collaboration with the Indian Health Service (ACOG, 2018).

Limitations

Study findings should be considered with respect to several limitations. First, regarding the generalizability of the findings, this sample was relatively young, “slightly liberal” on average (with a range from “very liberal” to “very conservative”) and, like more than half of the U.S. population (Ryan & Bauman, 2016), had completed some college. The extent to which our findings would generalize to older adults, adults with less educational attainment, and those with more politically conservative beliefs at baseline is unclear. Replication of this research with samples across the social and political spectrum and in other geographic regions of the U.S. would address this question. In particular, replication is needed in communities with political momentum for criminal laws targeting pregnant women. Regarding this study’s experimental design, presentation of information about women’s drug use was limited to text only, which may not represent the multimodal ways that the public learns about prenatal drug use, as in the case of audiovisual media reports, or encountering pregnant women who use drugs in the community. A more multimodal study design may yield different results, such that knowing about a pregnant woman’s trauma history matters less if the public is exposed to visceral details of her drug use (e.g., a video of a pregnant woman injecting heroin).

In this study, vignettes about pregnant women who use drugs focused on the use of methamphetamine (along with tobacco and marijuana). It is unclear whether information about maternal trauma history would also reduce punitive attitudes toward pregnant women who use other drugs, such as alcohol. Alcohol is arguably the drug with the most harmful (teratogenic) impact on embryonic and fetal development. In addition, this study did not manipulate the perceived race/ethnicity of the woman in the vignette, leaving open the question of how the effect of trauma history information on punitive attitudes and consequences might differ on the

basis of the pregnant woman's race/ethnicity. This is an important issue for a number of reasons. For one, as stated previously, despite not representing the majority of pregnant women who use drugs, racial and ethnic minority women are disproportionately impacted by punitive legal consequences for prenatal drug use (Flavin & Paltrow, 2010). Relevant to this study's finding that punitive attitudes predict agreement with a punitive legal consequence, White Americans view Black adolescents as more blameworthy for wrongdoing than White adolescents (Rattan, Levine, Dweck, & Eberhardt, 2012), an indication of bias that may also apply to perceptions of pregnant women of color who use illicit drugs. This is an important area for ongoing research.

Conclusions

State legislation that criminalizes the act of drug use in pregnancy (rather than providing supportive resources) occurs within the broader U.S. context of criminal laws and policies that target sexual and reproductive decision-making (Amnesty International, 2017). A divide persists between punitive policy-making and scientific consensus about how to promote public health across the perinatal period. Consequences of this science-policy disconnect continue to play out on political stages across the country, even as trends in drug use and its media representation shift over time. In the 1980s and early 1990s, crack cocaine was the subject of the most sensationalized media depictions; in the early 2000s, methamphetamine; and in the time since we designed this study in the early 2010s, opioid use among pregnant women has reached "epidemic proportions" (Krans & Patrick, 2016, p. 4), even as opioid treatment programs in Appalachian states impacted by the epidemic do not accept pregnant women as patients (Patrick et al., 2018).

Promoting positive outcomes for mothers with drug use and addiction is, in many ways, dependent upon finding new ways to influence public opinion and subsequently policy. This study suggests a novel means of beginning to work towards altering the public's perception of

women who use drugs during pregnancy. Our research indicates that providing greater context about women's experiences can lead to significant changes in perception. Providing accurate, accessible, and perhaps individual story-based information about this population may be a key to unlocking greater support for policies that help pregnant women make safe, informed decisions with dignity and access to healthcare.

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Table 1

Average Agreement with Each Attitude Item per Vignette about the Woman Using Methamphetamine Presented by Pregnancy Status and Childhood Trauma History

	Woman's Childhood Trauma History (Interpersonal vs. Non-Interpersonal)				
	Non-Pregnant		Pregnant		
	IP	Non-IP	IP	Non-IP	Control
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<i>Supportive Attitude Item</i>					
Sick with addiction	4.37 (0.79)	4.34 (0.77)	4.42 (0.74)	4.40 (0.81)	4.27 (0.89)
Receive treatment	4.43 (0.67)	4.28 (0.65)	4.45 (0.76)	4.50 (0.66)	4.42 (0.68)
Need health prof'l help	4.34 (0.78)	4.23 (0.81)	4.39 (0.89)	4.25 (0.90)	4.35 (0.83)
Give access to resources	4.57 (0.63)	4.45 (0.73)	4.45 (0.62)	4.33 (0.86)	4.43 (0.82)
With support able to heal	4.38 (0.67)	4.29 (0.74)	4.13 (0.80)	4.09 (0.79)	4.04 (0.77)
Help support decisions	4.23 (0.75)	4.29 (0.68)	4.21 (0.79)	4.08 (0.88)	3.88 (0.99)
Need make changes	4.27 (0.69)	4.12 (0.71)	4.00 (0.72)	4.18 (0.68)	4.03 (0.78)
<i>Punitive Attitude Item</i>					
Could stop using if wanted	1.70 (0.79)	2.05 (0.80)	2.52 (1.11)	2.48 (0.95)	2.43 (0.10)
Lacks moral compass	2.13 (1.03)	2.58 (0.88)	2.90 (0.95)	3.02 (1.03)	2.86 (1.11)
Entirely her fault	1.80 (0.87)	2.82 (1.12)	2.15 (1.04)	2.95 (1.00)	3.19 (1.04)
Never show good judgment	1.78 (0.83)	2.01 (0.87)	2.16 (0.73)	2.23 (0.79)	2.19 (0.82)
Completely responsible	3.30 (0.97)	3.62 (0.93)	3.45 (0.97)	3.72 (0.96)	3.91 (0.95)
Solely own bad choices	2.09 (0.95)	3.08 (1.11)	2.44 (0.99)	3.03 (1.05)	3.36 (1.09)

Note. $N = 461$. Items are abbreviated. IP = Interpersonal trauma perpetrated by a close other. Non-IP = Non-interpersonal trauma. Control = No childhood history information included in the vignette. Agreement with each item was measured on a 5-point scale as follows: *strongly disagree* (1), *disagree* (2), *neither agree nor disagree* (3), *agree* (4), and *strongly agree* (5).

Table 2

Model Results for Effect of Trauma History Information on Reduced Agreement with Prison Sentence for Pregnant Woman via Less Punitive Attitudes

		Outcome: M_1 (Supportive Attitudes)				
Predictor		Coeff.	SE	p	LLCI	ULCI
Constant		29.40	0.65	< .001	28.11	30.68
Any trauma vs. control	a_{11}	0.50	0.43	.252	-0.36	1.35
IP vs. non-IP trauma	a_{21}	0.46	0.55	.397	-0.61	1.54
Political conservatism		-0.37	0.13	.004	-0.62	-0.12
Female		1.86	0.45	< .001	0.97	2.75
		Outcome: M_2 (Punitive Attitudes)				
Predictor		Coeff.	SE	p	LLCI	ULCI
Constant		14.06	0.72	< .001	12.64	15.47
Any trauma vs. control	a_{12}	-1.50	0.48	.002	-2.44	-0.56
IP vs. non-IP trauma	a_{22}	-1.99	0.60	.001	-3.17	-0.80
Political conservatism		0.74	0.14	< .001	0.46	1.02
		Outcome: Y (Prison Sentence for Pregnant Woman)				
Predictor		Coeff.	SE	p	LLCI	ULCI
Constant		1.88	0.54	.001	0.83	2.94
Supportive attitudes	b_1	-0.05	0.02	.002	-0.08	-0.02
Punitive attitudes	b_2	0.09	0.01	< .001	0.06	0.12
Any trauma vs. control	c'_1	0.22	0.11	.048	0.00	0.45
IP vs. non-IP trauma	c'_2	0.24	0.14	.095	-0.04	0.52

Note. $N = 280$. Regression coefficients for each predictor are listed in the "Coeff." column. *Any trauma vs. control* = Helmert contrast-coded dummy variable representing vignette conditions in which Nia was pregnant with any childhood trauma history (interpersonal or non-interpersonal) vs. pregnant with no childhood information; *IP vs. non-IP trauma* = Helmert contrast-coded dummy variable representing vignette conditions in which Nia was pregnant with a history of childhood interpersonal vs. non-interpersonal trauma; *CI* = 95% bootstrap confidence interval; *LL* = lower limit; *UL* = upper limit. Parameter estimates for covariates with confidence intervals that included zero are omitted for economy of presentation. Confidence intervals for the parameter estimates of the effect of participants' social desirability response bias on each outcome all included zero and as such, this covariate is not included in the table.

Figure 1. Effects of the vignette woman's pregnancy status and childhood trauma history on punitive (a) and supportive (b) attitudes

Figure 2. Effect of information about pregnant woman's trauma history on decreased agreement with a punitive consequence for prenatal substance use mediated by less punitive attitudes toward women with trauma histories. *Any trauma vs. control* = Helmert contrast-coded dummy variable representing vignette conditions in which Nia was pregnant with any childhood trauma history (interpersonal or non-interpersonal) vs. pregnant with no childhood information; *IP vs. non-IP trauma* = Helmert contrast-coded dummy variable representing vignette conditions in which Nia was pregnant with a history of childhood interpersonal vs. non-interpersonal trauma. Sociodemographic covariates are participant gender (female vs. male), political conservatism, and social desirability response bias. Parameter estimates and arrows for non-significant effects of covariates on endogenous variables are omitted from the figure for clarity of presentation. $a_{12}b_2$ and $a_{22}b_2$ are the bias-corrected bootstrap estimates of the indirect effects with confidence intervals entirely below zero: $a_{12}b_2 = -0.14$ ($SE = .05$), 95% CI $[-0.26, -0.06]$ and $a_{22}b_2 = -0.18$ ($SE = .06$), 95% CI $[-0.31, -0.09]$.

* $p < .05$ ** $p < .01$ *** $p < .001$

Supplemental Materials

Data Cleaning and Visualization

Data in the current study were cleaned and visually inspected using standard procedures. First, we inspected the data to identify missing data and potential outliers. We used the standard decision rule that any data point of $|z| > 3.00$ was indicative of an outlier (Kline, 2011). There were no observations with outlying values on the punitive consequences variables and only 4 observations with outlying values on the supportive and punitive attitude variables. These observations were only a few tenths of a decimal point above the $|z| > 3.00$ criterion for outlying values. As these were within the range of the frequency of outliers that would be expected for a normally distributed variable, we did not transform these variables prior to analysis.

Figures 3 and 4 present boxplots representing the distributional properties of the punitive attitudes and supportive attitudes outcome variables by experimental condition. Visual inspection of the plots suggests that both variables are normally distributed, a finding supported by their indices of skew and kurtosis, both < 1.96 .

Model Specification for the Test of Indirect Effects of Pregnant Women's Trauma History on Endorsement of Incarceration

For readers with interest in the technical details of the statistical analysis presented in Table 2 and Figure 2, we provide more detail on model specification here. As stated in the Analysis Plan, we used the Hayes and Preacher (2014) method for testing indirect effects, accomplished with Hayes' PROCESS macro for SPSS version 2.16.1 (Hayes, 2013). The multiple mediation analysis focused on the vignette conditions in which Nia was pregnant. We tested the direct effects of information about maternal abuse history (X) on agreement with incarceration (a punitive consequence for pregnant Nia's substance use) (Y) and the indirect

effects, via supportive (M_1) and punitive (M_2) attitudes (see Figure 2). The independent variable (X) was multicategorical, with three conditions ($k = 3$): pregnant with childhood interpersonal trauma history, pregnant with childhood non-interpersonal trauma history, and the pregnant-only control condition with no childhood information. As such, this multicategorical independent variable was contrast-coded into $k-1$ Helmert-contrast dummy variables that enabled us to test two theoretically meaningful comparisons (Hayes & Preacher, 2014). The first dummy variable (D_1) contrasted the two experimental conditions in which pregnant Nia had a childhood abuse history to the control condition in which Nia was pregnant only, with no childhood information. The second (D_2) contrasted the experimental conditions in which pregnant Nia had a childhood interpersonal vs. a non-interpersonal trauma history. The latter dummy variable enabled us to test whether it was *any* trauma history that impacts decreased agreement with incarceration, or specifically history of interpersonal trauma perpetrated by close others. Participant sex, political conservatism, and social desirability bias were included in the model as covariates.

Figure 3. Boxplot of mean punitive attitudes per vignette experimental condition

Figure 4. Boxplot of mean supportive attitudes per vignette experimental condition

Appendix

Manipulation: Vignettes

Instructions: We are interested in how people think about and react to drug use. Please read the following paragraphs about a woman who is currently using drugs. After you are finished reading, we will ask some follow-up questions that are expected to take 15 minutes to complete.

[Participants are assigned randomly to read 1 of the following 5 vignettes]

Vignette 1: Pregnant adult with interpersonal trauma history. Nia's step-father physically and sexually abused her from the time she was a young child until she left home at age 15. Over the years, Nia felt fear, helplessness, horror, and confusion that she was being harmed by someone who was supposed to keep her safe. When she tried to tell her mother about the abuse, her mother did not believe her. As a result of these experiences, Nia felt betrayed and depressed, alternating with times of numbness, feeling detached from others, and having trouble remembering parts of her past experiences. She has had difficulty sleeping and has experienced intense nightmares and night terrors.

Nia has used methamphetamine (meth) for the past 5 years. She is currently 6 months pregnant. When Nia does not use, she experiences withdrawal symptoms that include anxiety, exhaustion, and cravings for meth. If she does not have any meth at home, she will smoke cigarettes or marijuana to hold her over until she can obtain more. She had not planned on becoming pregnant or really thought much about the possibility. Since finding out about the pregnancy, she has continued to use meth. She has not visited the doctor during her pregnancy or discussed her pregnancy with any health care professionals.

Vignette 2: Non-pregnant adult with interpersonal trauma history. Nia's step-father physically and sexually abused her from the time she was a young child until she left home at age 15. Over the years, Nia felt fear, helplessness, horror, and confusion that she was being harmed by someone who was supposed to keep her safe. When she tried to tell her mother about the abuse, her mother did not believe her. As a result of these experiences, Nia felt betrayed and depressed, alternating with times of numbness, feeling detached from others, and having trouble remembering parts of her past experiences. She has had difficulty sleeping and has experienced intense nightmares and night terrors.

Nia has used methamphetamine (meth) for the past 5 years. The only people who know about her meth use are the people who use with her. She does not like talking about her drug use with anyone else. When Nia does not use, she experiences withdrawal symptoms that include anxiety, exhaustion, and cravings for meth. If she does not have any meth at home, she will smoke cigarettes or marijuana to hold her over until she can obtain more. She has not visited the doctor since beginning to use meth. She has never discussed the way her drug use has impacted her body with any health care professionals.

Vignette 3: Pregnant adult with non-interpersonal trauma history. From the time Nia was a young child, she experienced chronic neck pain due to an injury from a serious car accident involving her mother and self-father. During the accident, Nia felt fear, helplessness, and horror, and thought that she was going to lose her parents. Her neck pain makes it difficult for her to sleep, to sit for long periods of time, or to exercise and move around comfortably.

Nia has used methamphetamine (meth) for the past 5 years. She is currently 6 months pregnant. When Nia does not use, she experiences withdrawal symptoms that include anxiety, exhaustion, and cravings for meth. If she does not have any meth at home, she will smoke

cigarettes or marijuana to hold her over until she can obtain more. She had not planned on becoming pregnant or really thought much about the possibility. Since finding out about the pregnancy, she has continued to use meth. She has not visited the doctor during her pregnancy or discussed her pregnancy with any health care professionals.

Vignette 4: Non-pregnant adult with non-interpersonal trauma history. From the time Nia was a young child, she experienced chronic neck pain due to an injury from a serious car accident involving her mother and self-father. During the accident, Nia felt fear, helplessness, and horror, and thought that she was going to lose her parents. Her neck pain makes it difficult for her to sleep, to sit for long periods of time, or to exercise and move around comfortably.

Nia has used methamphetamine (meth) for the past 5 years. The only people who know about her meth use are the people who use with her. She does not like talking about her drug use with anyone else. When Nia does not use, she experiences withdrawal symptoms that include anxiety, exhaustion, and cravings for meth. If she does not have any meth at home, she will smoke cigarettes or marijuana to hold her over until she can obtain more. She has not visited the doctor since beginning to use meth. She has never discussed the way her drug use has impacted her body with any health care professionals.

Vignette 5: Pregnant adult - control vignette (no childhood information). Nia has used methamphetamine (meth) for the past 5 years. She is currently 6 months pregnant. When Nia does not use, she experiences withdrawal symptoms that include anxiety, exhaustion, and cravings for meth. If she does not have any meth at home, she will smoke cigarettes or marijuana to hold her over until she can obtain more. She had not planned on becoming pregnant or really thought much about the possibility. Since finding out about the pregnancy, she has continued to use meth. She has not visited the doctor during her pregnancy or discussed her pregnancy with any health care professionals.