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Moderators and mediators of the relationship between receiving versus being denied a pregnancy termination and subsequent binge drinking

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ABSTRACT

Background: Women who terminate pregnancies drink more subsequent to the pregnancy than women who give birth, including women who give birth after seeking to terminate a pregnancy.
Methods: Data are from the Turnaway Study, a prospective, longitudinal study of 956 women who sought to terminate pregnancies at 30 U.S. facilities. This paper focuses on the 452 women who received terminations just below facility gestational limits and 231 who were denied terminations because they presented just beyond facility gestational limits. This study examined whether baseline characteristics moderate the relationship between termination and subsequent binge drinking and whether stress, feelings about the pregnancy, and number of social roles mediate the relationship.
Results: Only having had a previous live birth modified the termination–binge drinking relationship. Among women with previous live births, binge drinking was reduced among women carrying to term compared to terminating the pregnancy. Among women who had not had a previous live birth, however, the reduction in binge drinking among those denied termination was not sustained over time, and binge drinking of those who had and had not had terminations converged by 2.5 years. Neither stress, negative emotions, nor social roles mediated effects on binge drinking. Positive emotions at one week mediated effects on binge drinking at six months, although positive emotions at two years did not mediate effects on binge drinking at 2.5 years.
Conclusions: Higher levels of binge drinking among those who terminate pregnancies do not appear due to stress or to negative emotions. Only parous women – and not nulliparous women – denied terminations experienced sustained reductions in binge drinking over time.

1. Introduction

Most research about pregnancy termination and subsequent alcohol use and alcohol use disorders (AUDs) finds that women who terminate pregnancies drink more alcohol and are more likely to have AUDs subsequent to the pregnancy than women who continue pregnancies (Coleman, 2005; Major et al., 2009; Pedersen, 2007; Steinberg and Finer, 2011). Some researchers have explained this finding by positing that terminating a pregnancy leads women to drink alcohol to cope with the stress of pregnancy termination (Coleman, 2005; Coleman et al., 2002, 2005; Pedersen, 2007). In contrast to the stress-and-coping explanation, our recent research has found that binge and problem alcohol use among women who terminate stay steady over time (Roberts et al., 2015).

An alternative explanation is that those who continue pregnancies experience a pregnancy/parenting-related reduction in alcohol consumption (Roberts et al., 2015). Pregnancy/parenting-related reductions in alcohol consumption are well documented (Alvik et al., 2006; Chambers et al., 2005; Ethen et al., 2009; Gilchrist

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et al., 1996; Tough et al., 2006). Our recent research found sustained reductions in any and binge alcohol use among women who continued compared to women who terminated pregnancies (Roberts et al., 2015), demonstrating a pregnancy/parenting-related reduction among women who continued pregnancies. Our sample in this previous research consisted entirely of women whose pregnancies were unwanted (which we define for the purposes of this paper as having sought to terminate the pregnancy), indicating that the reduction was not due to willingness and interest in reducing alcohol use among women self-selecting into pregnancy and parenthood.

Our previous research did not examine whether this apparent pregnancy/parenting-related reduction was universal or concentrated among subgroups. Understanding whether the reduction was concentrated among subgroups – especially among women without previous births – can help distinguish whether something about pregnancy and postpartum periods in general or something about the initial transition to parenting (from not parenting) contributes to this reduction. Our previous research also did not examine whether any subgroups of those terminating pregnancies increased drinking. Thus, this paper presents new findings from a series of moderation analyses that examine whether our overarching findings apply across different subgroups.

This paper also presents findings from mediation analyses that test two hypothesized pathways through which terminating versus continuing an unwanted pregnancy relates to subsequent binge alcohol use: stress/coping and social roles. Stressful events have been linked to alcohol use in general (Hasin et al., 2007), heavy drinking in pregnancy (May et al., 2000), and postpartum tobacco relapse (Carmichael and Ahluwalia, 2000). Pregnancy termination has been hypothesized as a stressful or traumatic event resulting in alcohol and drug disorders (Coleman, 2005; Coleman et al., 2005, 2002; Pedersen, 2007). The fact that we did not find increases in binge drinking or alcohol-related problem symptoms subsequent to termination in previous analyses (Roberts et al., 2015) raises questions about this hypothesis. Mediation analysis that examines whether the relationship between termination and alcohol consumption operates through stress can shed additional light on this hypothesized pathway.

While we did not find increases in drinking among women denied termination, women denied termination could experience stress due to additional economic and relationship difficulties related to the unwanted pregnancy (Foster et al., 2012; Mauldon et al., 2015; Roberts et al., 2014a). This stress could lead women denied terminations to consume alcohol to cope. Our previous analyses found that perceived stress was initially higher after being denied than after receiving terminations, but these differences were temporary (Harris et al., 2014). Further, those who had more difficulty coping – either with termination or continued pregnancy – may also drink more subsequent to the pregnancy. Difficulty coping may be apparent through women's emotional responses to pregnancy. While women experience a range of emotions after terminating or being unable to terminate an unwanted pregnancy, one week after seeking termination, women terminating had fewer positive emotions about the pregnancy than women denied terminations (Rocca et al., 2013). We thus examine both stress and feelings about the pregnancy as potential mediators.

The second hypothesized pathway relates to changes in social roles that may occur as a result of having a baby. Theories related to social roles and alcohol suggest that lower consumption among parents may result both from less time to drink due to caregiving responsibilities and from increased life satisfaction and increased social monitoring due to filling more roles; alternatively, more social roles can lead to role overload, leading women to drink more to cope. Research generally supports the former theories (see Cho and Crittenden, 2006; Hajema and Knibbe, 1998; Kuntsche et al., 2009; Staff et al., 2014; Wilsnack and Cheloha, 1987). An aspect of this literature suggests that it is actually the transition to parenting (from not parenting) that is associated with a reduction in drinking (see, for example, Chilcoat and Breslau, 1996). Thus, our moderation analyses that consider whether the relationship varies depending on whether women had previously given birth can also help answer the question of whether responsibilities of parenting infants or whether the *new* social role of parenting leads to reduced drinking.

2. Methods

2.1. Data source

Data come from the Turnaway Study, a prospective, longitudinal cohort study of 956 women seeking to terminate pregnancies in the U.S. The Turnaway Study seeks to understand how the outcome of an unwanted pregnancy affects women's subsequent physical and mental health and socioeconomic status (Foster et al., 2015; Harris et al., 2014; Roberts et al., 2014a,c, 2015; Roberts and Foster, 2015; Rocca et al., 2013, 2015). Analyses presenting the main effects of termination versus birth on subsequent alcohol use, binge drinking, and problem symptoms have been published previously (Roberts et al., 2015). This paper extends previous analyses by focusing on moderators and mediators of the relationships presented previously. The University of California, San Francisco Committee on Human Research granted ethical approval for this study. Written informed consent was obtained from all study participants. Study design details have been published previously (Dobkin et al., 2014; Gould et al., 2012; Upadhyay et al., 2014).

Study participants presented for termination at one of 30 pregnancy termination facilities throughout the U.S. between January, 2008 and December, 2010 and met criteria for one of three study groups: (1) "*Near Limit Termination Group*" – women presenting for termination within two weeks under a facility's gestational age limit for providing termination and receiving a termination; (2) "*Turnaways*" – women presenting for termination up to three weeks over a facility's gestational limit and denied termination; and (3) "*First Trimester Termination Group*" – women under the gestational limit, in their first trimester, and receiving termination. These three groups were recruited in a 2:1:1 ratio. More *Near Limits* were recruited because we expected that fewer women would meet eligibility criteria for *Turnaways* and we wanted to ensure an adequate overall sample. Also, women seeking later terminations are understudied and we wanted to have an adequate sample of *Near Limits* to examine their experiences (e.g., Foster and Kimport, 2013; Roberts et al., 2014b). All participants spoke English or Spanish and did not have a known fetal anomaly or demise.

The overall study design took advantage of a natural quasi-experiment where some women receive a termination just before the gestational limit for providing terminations at a given facility and some are denied termination because they present just beyond the gestational limit at that same facility. Gestational limits for pregnancy termination vary across facilities due to both state-level restrictions and facility factors. Facilities could participate if they had the latest gestational limit within 150 miles. Facilities were identified using the National Abortion Federation directory and contacts within the pregnancy termination research community. All but two facilities approached agreed to participate. One of the facilities that declined to participate was replaced with a facility with an identical catchment area, identical gestational limit, and similar patient volume. Gestational limits at participating facilities ranged from 10 weeks through the end of the second trimester.

2.2. Participation

The sample includes 956 participants: 452 *Near Limits*, 231 *Turnaways*, and 273 *First Trimesters*. These participants represent 84.5% of those who consented to participate in the five-year telephone interview study ($n = 1132$); those who consented represent 37.5% of women who were approached about the study and were eligible. There were no statistically significant differences in the proportion of eligible *Near Limits* and *Turnaways* who participated. More details are available in a paper describing study methods (Dobkin et al., 2014). Of the 956 participants, 76 from one facility were removed from analyses because more than 90% of *Turnaways* at that facility (a facility with a 10-week gestational limit) terminated their pregnancies elsewhere after study enrollment. Also, two *Near Limit* and one *First Trimester* participant later reported that they had not terminated their pregnancies and thus were excluded from analyses. Thus, the final sample is 413 *Near Limit Termination*, 210 *Turnaways* (50 of whom terminated the pregnancy or had a miscarriage subsequent to being turned away and whom we then analyzed separately from the *Turnaways* who gave birth – see Section 2.5), and 254 *First Trimester Termination* group. Analyses in this paper focus primarily on the *Near Limits* and the 160 *Turnaways* who had a birth, whom we refer to as *Turnaway Births*. We focus on this comparison because this is the comparison that takes advantage of the quasi-experimental design. As reported previously, the study design was successful, with *Near Limit* and *Turnaway Birth* groups similar on key baseline characteristics, including any alcohol use, binge