



Short communication

Smoking concordance during pregnancy: Are there relationship benefits?

Talea Cornelius^{a,*}, Alethea Desrosiers^b, Trace Kershaw^b^a Department of Psychological Sciences, University of Connecticut, Storrs, CT, 06269, USA^b Yale School of Public Health, New Haven, CT, 06520, USA

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ABSTRACT

Objective: Couples often engage in similar patterns of behavior, including substance use, and similarity may benefit relationship quality. Such relationship benefits may be especially salient for adolescent and young couples, whose relationships are often unstable and prone to breakups. This study examined the effect of mutual smoking during pregnancy on relationship quality in pregnant adolescent and young adult couples.

Methods: Couples ($N = 228$; $M_{AgeFemale} = 18.69$; $M_{AgeMale} = 21.12$) were recruited from obstetrics/gynecology clinics in Connecticut from July 2007 to February 2011. Couples completed measures of recent smoking and relationship quality (i.e. satisfaction, affectional expression, cohesion, and consensus) during pregnancy and at six months postpartum. Data were analyzed using multilevel models to account for interdependence within dyads.

Results: Discrepant smoking patterns were associated with a reduction in satisfaction and cohesion over time ($B = -1.14$, $p = 0.03$, and $B = -2.74$, $p = 0.03$, respectively), and a reduction in consensus over time for female participants, $B = -1.98$, $p = 0.07$, but not for male participants, $p = 0.51$. Discrepant smoking was not related to affectional expression, $p = 0.11$.

Conclusions: Results suggest relationship benefits concordant smoking patterns during pregnancy. Interventions should consider potential unintended relationship consequences of changing individual health behavior and instead work to develop couple-level health interventions.

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1. Introduction

Cigarette use during pregnancy can lead to numerous negative health consequences for infants, including congenital heart defects, low birthweight, and miscarriage (Lee and Lupo, 2013; Pineles et al., 2014; Wang et al., 2002). Rates of smoking during pregnancy are highest among young women ages 18–25 (~21%), followed by ages 15–17 (Curtin and Matthews, 2016; SAMHSA, 2014; USDHHS, 2014). Understanding the antecedents and consequences of smoking while pregnant, especially in young pregnant couples who are already at risk for poor birth outcomes (Fraser et al., 1995), might illuminate avenues for intervention. This study took a couple-level approach to examine the effects of concordant smoking (i.e. both partners smoke or both do not smoke) on

relationship quality in adolescent and young adult pregnant couples. Parsing out the relationship consequences of smoking during pregnancy might inform development of couple-based smoking cessation interventions for young pregnant couples.

Couples often engage in similar patterns of health behaviors, including substance use, thus highlighting the need for a dyadic approach to health. Researchers have examined how this similarity arises through processes of assortative mating (i.e. selecting similar partners; Rhule-Louie and McMahon, 2007) and social influence (Cornelius et al., 2016; Fleming et al., 2010). The consequences of within-couple similarity on substance use have also been examined. Newlywed couples who drink or use drugs in concordant patterns are more satisfied than those with discrepant patterns (Mudar et al., 2001), and discrepant heavy drinking can contribute to divorce (Leonard et al., 2014) and lower relationship satisfaction (Homish and Leonard, 2007). This research raises a curious possibility: there might be relationship benefits to engaging in negative health-risk behaviors together.

Shared risk behaviors may contribute to satisfaction and stability

* Corresponding author. Center for Behavioral Cardiovascular Health, Columbia University Medical Center, 622 West 168th Street, New York, NY, 10471, USA.

E-mail address: tmc2184@cumc.columbia.edu (T. Cornelius).

within couples. Preserving relationships may especially be pertinent for adolescent and young adult pregnant couples because relationships during this developmental period are often unstable (Kershaw et al., 2010). Although smoking poses serious health consequences to both mother and child (USDHHS, 2004), the relationship might suffer during a solitary quit attempt. Because the positive effects of concordance may be stronger for more deviant behaviors (Mudar et al., 2001), and smoking during pregnancy is widely viewed as deviant (Bull et al., 2007; Wigginton and Lee, 2013), relationship benefits of concordance might be amplified during pregnancy.

The effects of smoking concordance on relationship quality during pregnancy may vary depending upon whether it is concordant use (i.e. both smoking) or nonuse. Previous research shows a positive association between relationship satisfaction and odds of smoking cessation for female partners (this was true for male partners only if their partner had quit as well; Foulstone et al., 2017) and a negative association between relationship quality and smoking unrelated to partner smoking (Fleming et al., 2010). Findings suggest that, for some couples, there may be no relationship benefits when both partners smoke. However, these studies did not separate the interrelationships between satisfaction and smoking for pregnant couples, and smoking during pregnancy carries additional health and social consequences. If concordance in smoking behavior is associated with greater relationship satisfaction and discordance is associated with less satisfaction, potential consequences of quitting alone may include a reduction in relationship satisfaction.

Smoking concordance may also have different effects depending on which aspect of relationship quality is considered. Findings suggest that feeling like a “team” within a relationship context, rather than satisfaction, shapes responses to pressure to quit smoking (Scholz et al., 2013). We therefore adopted a multidimensional conceptualization of relationship quality – dyadic adjustment – to gain a nuanced understanding of the consequences of concordant smoking behaviors among young pregnant couples. Dyadic adjustment (Spanier, 1976) consists of four dimensions of relationship quality: satisfaction (happiness), cohesion (feelings of companionship), consensus (agreement on values or life decisions), and affectional expression (affectionate behavior). To our knowledge, no previous studies have examined whether similarities in smoking behavior are differentially associated with dimensions of relationship quality, particularly among young pregnant couples.

This study examined the effects of smoking concordance during pregnancy on four dimensions of relationship quality postpartum: satisfaction, cohesion, consensus, and affectional expression. We hypothesized that concordant smoking patterns would lead to higher relationship quality. No hypothesis was made regarding patterns of concordant use versus nonuse, given inconclusive research support for patterns in either direction (Fleming et al., 2010; Foulstone et al., 2017; Mudar et al., 2001). Gender differences were also explored given previous research (Foulstone et al., 2017) and health and social consequences of smoking specific to pregnant women (e.g., stigmatization; Bull et al., 2007; Wigginton and Lee, 2013). This study advances knowledge on smoking behavior during pregnancy by using a dyadic approach to understanding health-risk behavior in couples and adopting a multidimensional conceptualization of relationship quality, which could highlight important couple-level avenues for interventions.

2. Methods

2.1. Participants

Participants were pregnant young women and their male partners recruited from obstetrics/gynecology clinics and an

ultrasound clinic in four university-affiliated hospitals in Connecticut between July 2007 and February 2011 (see Kershaw et al., 2013). Inclusion criteria were (a) the pregnant partner is in the second or third trimester of pregnancy, (b) women between ages 14–21 and men at least 14 years old, (c) both members of the couple report being in a romantic relationship with each other, (d) both report being the biological parents of the unborn baby, (e) both agree to participate in the study, (f) neither reports HIV + status, and (g) both speak English or Spanish.

A total of 429 individuals (72.47%) from 228 couples (77.03%) provided full data. Female participants, $OR = 1.48$, $p = 0.03$, younger participants, $OR = 0.95$, $p = 0.05$, Latinx participants, $OR = 1.54$, $p = 0.04$, and smoking less during pregnancy, $OR = 0.87$, $p = 0.05$, related to providing full data.

Female participants were younger than male participants, $M = 18.69$, $SD = 1.62$ and $M = 21.12$, $SD = 3.66$, respectively. Female participants were 38.94% Black, 42.48% Latinx, 14.16% White, and 4.42% other. Male participants were 47.29% Black, 39.90% Latinx, 9.36% White, and 3.45% other. Median household income was \$5000–\$9,999, mean relationship length was 2.11 years ($SD = 1.52$), 60.37% lived together, and 17.02% were married.

2.2. Procedure

Written informed consent was obtained by a research staff member at baseline, which occurred during the second or third trimester. Parental consent was waived because participants were parents and legally able to consent for care for themselves and their child. Participants completed structured interviews via audio computer-assisted self-interviews (ACASI) at baseline, 6-months postpartum, and 12-months postpartum (here, we used data from the baseline and 6-month interviews). Participation was voluntary and confidential and did not influence provision of healthcare or social services. All procedures were approved by the Yale University Human Investigation Committee and by Institutional Review Boards at study clinics. Participants were reimbursed \$25 each per assessment.

2.3. Measures

Cigarette use. Smoking during pregnancy was assessed with the question, “During the past 3 months, how often did you smoke cigarettes?” rated from 1, never, to 4, every day. Smoking discrepancy was calculated as the absolute value of the difference between couple members’ cigarette use.

Relationship quality. Relationship quality was measured using four subscales adapted from the Dyadic Adjustment Scale (DAS; Spanier, 1976). *Dyadic satisfaction* was measured with ten items, such as, “Please mark which best describes the degree of happiness, all things considered, of your relationship,” $\alpha = 0.83$. *Dyadic cohesion* was measured using five items, such as, “How often would you say the following events occur [...] Laugh together,” $\alpha = 0.74$. *Affectional expression* was measured using four items, such as, “Please mark if the next 2 items caused differences of opinions or were problems in your relationship [...] Not showing love” (reverse coded), $\alpha = 0.53$. *Dyadic consensus* was measured using 13 items, such as, “[...] Please mark how much you [...] agree or disagree about the following items. Handling family finances,” $\alpha = 0.88$.

2.4. Data analysis strategy

Data from couple members are interrelated, violating the statistical assumption of independence of observations. The Actor-Partner Interdependence Model (APIM; Kenny et al., 2006) accounts for this using a multilevel framework, with individuals

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