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Relationships with parents and adult children's substance use☆

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Abstract

Previous research has indicated that parents impact minor children's health behaviors and adult children's self-rated health and psychological well-being. However, little is known about the long-term consequences of the parent-child relationship for adult children's substance (i.e., smoking levels, low to moderate alcohol use) as adult children age. The present study uses growth curve analysis on longitudinal survey data (Americans' Changing Lives, N = 907) to examine how multiple dimensions of the parent-child tie influence adult children's substance use. Findings show that contact with mothers in adulthood has a health-enhancing effect on sons' smoking. Fathers' support is related to a decline in alcohol use for sons and daughters, but also an increase in smoking for sons only. Our findings for strain from parents are complex, suggesting that the ways in which adult children cope and manage strain with parents may result in multiple pathways of substance use. Our study raises new questions about whether and when family ties are "good" or "bad" for health and calls for a more multifaceted view of the long-lasting parent-child tie. We spotlight the need to look at the parent-child relationship as a dynamic social tie that changes over the life course and has consequences for health in adulthood.

Keywords

Alcohol use; Smoking; Parent-child tie

1. Introduction

Scholars have long shown that family relationships are key contributors to health (Thoits, 2010; Umberson, Crosnoe, & Reczek, 2010). The parent-child relationship is one central family tie with demonstrated effects on children's overall well-being (Fingerman, Pitzer, Lefkowitz, Birditt, & Mroczek, 2008; Suitor, Pillemer, & Sechrist, 2006). Previous research has primarily focused on the effects of the parent-child tie on minor children's substance use (Luk, Farhat, Iannotti, & Simons-Morton, 2010; Wills & Cleary, 1996) or on the effects of the parent-child tie on adult children's self-rated health and psychological well-being

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(Fingerman et al., 2008). However, little is known about the consequences of relationships with aging parents for adult children's substance use (e.g., smoking levels, alcohol use). Smoking and moderate alcohol use are significant public health issues in their own right, and in some cases, are found to be strong predictors of longevity and morbidity (Koh, 2010; Malyutina et al., 2002; Stringhini et al., 2010).

In order to fill this research gap, we use nationally representative longitudinal panel data to examine how adults' relationships with parents are associated with baseline levels of substance use and trajectories of change in substance use. Research demonstrates that both the form (e.g., frequency of contact) and content (e.g., positive and negative interactions) of parent-child ties matter for substance use (Ailshire & Burgard, 2012; Fingerman et al., 2008; Umberson, Liu, & Reczek, 2008). Consequently, we examine adult children's reports of three distinct dimensions of the parent-child tie: frequency of contact, relationship support, and relationship strain. Additionally, due to the longstanding body of research demonstrating the highly gendered nature of substance use (Courtenay, 2000) and the parent-child tie (Umberson, Crosnoe, et al., 2010), we further examine how the gender of both parent and adult child matters in this dynamic.

2. Background

2.1. Theorizing parental influence on adult children's substance Use

While most research on the parent-child tie and substance use takes focus on adolescence (Luk et al., 2010; Wills & Cleary, 1996), a significant gap in research exists regarding whether parent-child relationships in adulthood matter for adults' alcohol use and smoking. Leading theoretical work on family relationships and health behavior suggests that the content (e.g., support, strain) and form (e.g., frequency of contact) of intergenerational ties in adulthood are independent from childhood measures of these same dimensions (Ackard, Neumark-Sztainer, Story, & Perry, 2006), and more importantly that intergenerational relationships are independently influential on health (Fingerman et al., 2008). Moreover, the measures of contact, support, and strain have independent effects on health (Thoits, 2010), and thus evaluating only one of these dimensions provides an incomplete view of how the adult parent-child tie and its subsequent consequences for adults' substance use (Van Gaalen & Dykstra, 2006; Walen & Lachman, 2000). Below, we draw from theory and research on family ties and health behavior (Christakis & Fowler, 2013; House, Landis, & Umberson, 1988; Thoits, 2011; Umberson, Crosnoe, et al., 2010) to hypothesize how frequency of contact, relationship support, and relationship strain between parents and children in adulthood may have differential effects on adult children's substance use.

2.1.1. Frequency of contact—Frequency of contact between adult children and their parents may play a central role in adult children's substance use in several ways. First, frequency of contact after the period of coresidence and dependency of childhood and adolescence represents a primary relationship dynamic between adult children and their parents. When parents and adult children have contact, it may provide the opportunity to directly use social control tactics that shape substance use (Umberson, 1987). For example, parents, especially mothers, monitor and regulate their adult children's substance use via

direct social control (Umberson, Pudrovska, & Reczek, 2010); this may begin when children are young, but have a distinct effect when it occurs as children become adults and forge independent substance use. Second, parental contact may directly reinforce values, meanings, and norms associated with health behavior in unique ways for adult children, a dynamic known as indirect social control (Umberson, 1992), wherein high levels of contact may introduce or reflect routine and regularity that deter substance use. Third, drawing on notions of behavior norms, frequent and increasing contact may promote substance use via contagion theory—a parent who smokes may engender an adult child to smoke more by their contagion (Christakis & Fowler, 2013). However, this depends on parents' smoking and drinking behavior, as health behavior spread through social networks via contagion (Christakis & Fowler, 2008). Because of the multi-directionality of the proposed mechanisms, we do not offer hypotheses on the direction of the main effect of contact. Instead, we suggest that frequent contact with parents will likely increase the power of whatever the behavior norms, social control, and resource processes are in effect in adulthood. Thus, the direction of frequency of contact will depend on the degree to which these norms are substance use-promoting and substance use-deterring; the level of contact itself will determine the extent to which the processes affect behavior.

> **Hypothesis 1.** Contact with parents in adulthood will be associated with substance use in adult children initially and over time.

Parental support refers to the perception that one is loved and cared for, and has resources and assistance from parents (Bengtson, Giarrusso, Mabry, & Silverstein, 2002; Lye, 1996). The parent-adult child relationship is generally characterized as having high support exchanges and emotional closeness (Fingerman, Miller, Birditt, & Zarit, 2009; Fingerman et al., 2011). Theoretically, parental support would reduce substance use directly by providing adult children with a desire to take care of their health and indirectly by buffering against stress and reducing the desire for health-deterring coping mechanisms such as smoking or drinking alcohol. Research on social ties and health suggests that support from parents likely deters substance use among adult children via the enhancement of positive feelings, such as sense of security, and the reduction of the negative effects of stress (Cohen, 2004; Knoester, 2003; Umberson, Crosnoe, et al., 2010; Umberson et al., 2008). Moreover, relationship support from general network members, not parsing relationships with parents specifically, is strongly linked to health behavior across the life course (Thoits, 2011; Umberson et al., 2008). In contrast, low levels of support from parents in adolescence is associated with more substance use (Ackard et al., 2006; Luk et al., 2010; Wills & Cleary, 1996); this may translate to similar but unique effects in adulthood, although on research to date tests this possibility. Additionally, support may come in the form of financial and instrumental resources aimed to produce less smoking and drinking as children enter adulthood and begin to attempt to gain economic footing (Ross & Mirowsky, 2002). For example, as children enter early adulthood and midlife, economic support from parents may facilitate the purchasing of health insurance, providing access to smoking cessation programs when they otherwise would have few resources, although it is likely financial support from parents may also potentially increase resources for the purchasing of cigarettes and alcohol. Given this body of work:

Hypothesis 2. A higher level of support from parents will be associated with less substance use in adult children initially and over time; a lower level of support from parents will be associated with more substance use initially and over time.

Parental strain refers to degree of unpleasant interactions with, and being bothered or upset by, a parent (Umberson, Williams, Thomas, Liu, & Thomeer, 2014). Research shows that strain in the parent-child tie, which persists in early adulthood and midlife (Fingerman et al., 2011), is associated with adult children's increased distress and lower life satisfaction (Umberson, 1992; Umberson et al., 2008); these factors are independently related to increased substance use (Laitinen, Ek, & Sovio, 2002; Schulenberg, O'Malley, Bachman, & Johnston, 2005). Relationship strain in family relationships more broadly in has been associated with more substance use in adulthood (Umberson et al., 2008), with strain consistently measuring as more predictive of health and well-being than relationship support in broader family contexts (Uchino et al., 2012; Umberson et al., 2014). However, research in regard to the effects of parental strain on substance use has been largely restricted to adolescent health, wherein adolescents who experience strained relationships with parents report disproportionally high rates of substance use (Repetti, Taylor, & Seeman, 2002). It is unknown whether strain similarly shapes adult children's substance use. Taken together, we hypothesize:

Hypothesis 3. Strain from parents will be associated with more substance use in adult children initially and over time; lower levels of strain from parents will be associated with les substance use initially and over time.

2.2. Gender

Gender structures both substance use and the adult child-parent relationship. Substance use is gendered at the population level, wherein alcohol and cigarette use is higher among men than women (Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). This is theoretically because enactments of masculinity and femininity are linked with substance use, wherein men are more likely to respond to stress with externalizing behavior such as substance use as part of their performance of masculinity (Courtenay, 2000). The parent-adult child tie is also highly gendered. Mothers have higher frequency of contact, are more likely to utilize social control, and have higher quality relationships with adult children—especially their daughters—than fathers (Lye, 1996; Suitor et al., 2006; Ward, Spitze, & Deane, 2009); similarly, adult daughters have more contact with their aging parents than adult sons (Ward, Deane, & Spitze, 2014; Ward et al., 2009). Women are theorized to be more reactive and vulnerable to the quality of social relationships (Umberson, Chen, House, Hopkins, & Slaten, 1996), and this may make adult daughters' health behaviors more susceptible to their relationship with parents than adult sons'. Thus, it may be that frequency of contact, support, and strain from mothers during adulthood may be more salient to adult children's health behavior than fathers. Moreover, it appears that health behaviors are more highly influenced within same-gender pairs (e.g., mothers-daughters, fathers-sons). For example, a social network study showed that alcohol use is primarily spread-able among women (Rosenquist, Murabito, Fowler, & Christakis, 2010). Thus, because both fathers and sons are more likely to drink alcohol and smoke than mothers and daughters, any effect fathers have on children may likely be on sons' substance use and mothers may have a stronger effect on daughters'

substance use (Wickrama, Conger, Wallace, & Elder, 1999). Taken together, we hypothesize that:

Hypothesis 4a. Contact, support, and strain from mothers will be more consequential for adult children's substance use than that of fathers.

Hypothesis 4b. Contact, support, and strain from parents will be more consequential between same-gender dyads (i.e., mother-daughter, father-son) than cross-gender dyads.

3. Methods

3.1. Data

We analyze data from the first four waves of the Americans' Changing Lives (ACL) panel study (House, 1986). Multistage stratified area probability sampling is used to obtain the original sample of individuals in the contiguous United States (aged 24–96). Face-to-face structured interviews lasting approximately 90 min each were conducted with individuals in 1986 (N = 3617), 1989 (N = 2867), 1994 (N = 2398), and 2001 (N = 1787). We exclude respondents younger than 25 and older than 45 at baseline in order to reduce heterogeneity in life stage and focus only on substance use and the parent-child tie within the unique period of early- and mid-adulthood. Previous research has examined the effects of the parent-child tie on health at younger and older ages (Milkie, Bierman, & Schieman, 2008). In addition to age restrictions, we consider only respondents with a living mother and a living father who were mentally and physically capable of providing help or advice in Waves 1 and 2. Using a sample of only those with both a living mother and father makes our estimates conservative. We exclude respondents that have experienced the death of a parent, as this is a contextual life event that is likely critical to health behaviors and in order to have a sample with both relationship information for both mothers and fathers. The question of how death of a parent affects adult children's health behavior has been explored using ACL data in previous research (Umberson, 2003; Umberson & Chen, 1994). Additional analysis (not shown) including samples of respondents with only criteria of having a living mother (N = 1885) *or* a living father (N = 1231) yielded similar results but are not presented as they do not provide information on the influence of mothers' and fathers' ties net of one another. We also only include respondents who responded to at least three waves (required by growth curve modeling). Respondents lost to follow-up are more likely to be from lower socioeconomic groups and have less frequent and lower quality connections with parents and worse health behaviors, making our estimate of unhealthy behavior conservative. These three restrictions reduced our sample size to 907.

3.2. Measures

3.2.1. Frequency of contact, support, and strain—We use six variables to measure frequency of contact, support, and strain from parents: mother frequency of contact, father frequency of contact, mother support, father support, mother strain, and father strain. Mother and father frequency of contact are two separate variables each based on the response to the question, "During the past 12 months, how often did you have contact with your mother/father either in person, by phone, or by mail?" Responses range from 1 to 6 representing the

response categories of “more than once a week,” “once a week,” “2 or 3 times a month,” “once a month,” “less than once a month,” and “never.” We created two categories: once a month or less (reference) and at least 2 or 3 times month. Supplementary analysis conducted with additional contact response categories and a continuous variable of contact showed no difference in results (available upon request). Mother support and father support are two separate variables, each based on responses to the following questions: (a) “How much does your mother/father make you feel loved and cared for?” and (b) “How much is she/he willing to listen when you need to talk about your worries or problems?” Mother and father strain are two separate variables based on responses to the following questions: (a) “How much do you feel your mother/father makes too many demands on you?” and (b) “How much is she/he critical of you or what you do?” Each response ranges from 1 “not at all” to 5 “a great deal” and were summed so that mother and father strain and mother and father support range from 2 to 10 and greater values indicated higher levels of support/strain from mothers and fathers. To assess reliability of these indices, we estimated the interrelationships between items with a latent factor and found these factor loadings significant at the $p < 0.05$ level, indicating acceptable reliability. Strain from mothers and support from mothers is correlated at −0.27 ($p < 0.001$), and strain from fathers and support from fathers is correlated at −0.10 ($p < 0.001$). We use parental contact/support/strain at Wave 1 as our primary predictor variable. We also tested whether change in mothers’ and fathers’ frequency of contact, support, and strain from Wave 1 to 2 was related to change in adult children’s health behavior. Questions regarding the parent-child relationship were only asked in Waves 1 and 2; therefore, we are unable to assess the parent-child relationship in Waves 3 and 4. However, examining change in this relationship between Waves 1 and 2 allows us to further predict trajectories of change over time in substance use.

3.2.2. Substance use measures—We examine two substance use variables: cigarette smoking and alcohol use. Moderate to heavy substance use (e.g., drinking alcohol, smoking cigarettes) and increases in substance use over time are linked to increased cancer and heart disease risk (Corrao, Bagnardi, Zambon, & Arico, 1999; Room, Babor, & Rehm, 2005; Tolstrup et al., 2014). *Cigarette smoking* is a self-report of the number of cigarettes smoked per day. We use the number of cigarettes rather than a dichotomous smoking/non-smoking variable or another categorical variable of smoking in line with previous research which suggests that any increase or decrease in number of cigarettes smoked is predictive of health (Pampel & Rogers, 2004; Umberson et al., 2008). *Alcohol use* is an imputed self-report of number of drinks consumed last month. We use the number of drinks consumed last month rather than a dichotomous drinking/non-drinking variable or a categorical variable of drinking in line with previous research which suggests that any increase or decrease in drinking is predictive of health (Connor, 2016; Nelson et al., 2013; Room et al., 2005). Although there is some research that shows only binge drinking is predictive of mortality (Malyutina et al., 2002), drinking rates—especially increases in drinking in adulthood—are predictive of social stress, which is in turn related to alcohol use (Laitinen et al., 2002). Additionally, using a count measure of alcohol use allows us to examine trajectories in change in drinking over time, a goal of the present study. We use the log of smoking and alcohol use in our models to adjust for the skewedness of the distribution.

3.2.3. Sociodemographic covariates—All analyses control for age at baseline, gender (0 = adult daughter; 1 = adult son), race (0 = other; 1 = African American), education at baseline (measured in number of years), marital status at baseline (0 = currently unmarried; 1 = currently married), and income of adult child respondents at baseline (in $1000 s). In addition, given that drinking and smoking behaviors as well as parent-child relationship dynamics are often established before adulthood due to childhood stressors (Dube et al., 2006), we control for childhood stress, measured as the sum of four dichotomous items from Wave 1 asking if, as a child, respondents had experienced family economic hardship, had anyone in the home with mental health problems, had anyone in the home with a serious drinking problem, and had anyone in the home who was violent. About 4% of respondents were missing information on contact, strain, or support, 8% were missing information on alcohol use, and 19% were missing information on childhood stress.

3.3. Analytical approach

We use latent linear growth curve models to estimate the effects of adult relationships with mothers and fathers on initial levels (i.e., latent intercept) and change in subsequent waves (i.e., latent slope) in health behavior over time. One major advantage of growth curve models is it is able to distinguish within-individual from between-individual heterogeneity in estimating health behavior changes influenced by other variables. Models account for systematic variation in growth parameters (i.e., latent intercept and slope) attributable to parental relationship variables and other covariates, as well as heterogeneity in substance use trajectories across individuals. We compared linear, quadratic, and cubic models based on nested likelihood ratio tests and concluded that linear growth curves with random intercepts and random linear time slopes were the best fit for the data. Two separate sets of growth curve models are fit for alcohol use and smoking respectively. In each growth curve model, we use parental ties (contact, strain, and support) at Wave 1 to predict initial levels of adult health behaviors (i.e., latent intercept) and changes in health behaviors in subsequent waves (i.e., latent slope), as well as use changes in parental ties from Wave 1 to 2 to predict changes in health behavior for subsequent waves. The following equations specify the linear growth curve model we used for this study:

$$y_{it}=\eta_{0i}+\eta_{1i}T_{it}+\varepsilon_{it} \quad (1)$$

$$\eta_{0i}=\alpha_0+X_0{}'B_0+\zeta_{0i} \quad (2a)$$

$$\eta_{1i}=\alpha_1+X_1{}'B_1+\zeta_{1i} \quad (2b)$$

Eq. (1) represents within-individual change over time. Eqs. (2a) and (2b) represent between-individual change over time. The outcome variable is y_{it} (i.e., health behavior of adult child i at wave t); η_{0i} is the latent intercept (random effect); η_{1i} is the latent slope (random effect); T_{it} is the units of time (reflecting the number of years since Wave 1); x_0 and x_1 represent the

vectors of all covariates (including all parental tie variables at Wave 1, covariates for x_0 and x_1, and changes in all parental tie variables between Waves 1–2) to predict the latent intercept and slope respectively; and B_0 and B_1 are the corresponding vectors of coefficient. a_0 and a_1 are level-2 intercepts (i.e., fixed effects). Residuals are represented by ε_{it}, ζ_{0i}, and ζ_{1i}.

For each health behavior, we fit a series of growth curve models. We start with a model including all parental tie predictors and all sociodemographic covariates. We next stratify the models by child's gender in order to compare adult sons to adult daughters. In order to confirm the statistical differences between adult sons and adult daughters, we also test interaction effects of the parental tie with children's gender (available upon request), and only discuss findings as moderated by gender if this is supported by both the stratified analysis and interaction analysis. All analyses are conducted in MPlus (Muthén & Muthén, 2010). MPlus uses Full Information Maximum Likelihood (FIML) procedure to deal with missing data (Arbuckle, 1996). The FIML approach maximizes a casewise likelihood function using only those observed variables with the assumption of missing at random (MAR) (Muthén & Muthén, 2010).

4. Results

4.1. Descriptive results

Table 1 shows means or percentages for all variables at baseline used in the analysis separately by gender. Regarding relationships with parents, on average, respondents report high support and low strain with mothers and fathers, and most respondents have contact with parents two or more times a month. Women have more contact with mothers than men do, and women also report less strain with fathers than men. There are no other gender differences regarding relationships with parents. Regarding substance use, men drink more alcohol than women across all waves and smoke more cigarettes than women at baseline. The gender gap in alcohol use (9.8 drinks per month for women compared to 31.2 drinks per month for men at Wave 1) is most substantial. Further, on average, adults in this sample use less substances over time.

4.2. Growth curve results

Tables 2 and 3 show results from the growth-curve analyses, demonstrating the estimated effects of parental contact, support, and strain on the baseline level (latent intercept) and the rate of change (latent slope) in adult children's substance use over time. All models adjust for age, gender, race, years of education, marital status, childhood stress and family income. Table 2 shows the general results and Table 3 shows models including interactions between each dimension of the parent-child tie and gender.

4.2.1. Contact with parents—Table 2 shows the effects of contact with parents on adult children's alcohol use (Model 1) and smoking (Model 2). Model 1 shows no significant effects of contact with parents on children's alcohol use. Contact with one's mother two times a month or more is associated with a steeper decrease in smoking over time relative to contacting one's mother less than twice a month. Additionally, a decrease in contact with a

mother between Waves 1 and 2 is related to a modest increase in smoking over time compared to no change in maternal contact. In other words, the more contact with one's mother initially, the less adult children smoke over time, but, if maternal contact declines, the rate of smoking over time increases. We do not find any other significant effects.

4.2.2. Support from parents—Table 2 shows the effect of support from parents on adult children's alcohol use (Model 1) and smoking (Model 2). Results show an increase in fathers' support is related to a steeper decline in alcohol use over time relative to no change in paternal support (see Model 1 of Table 2). Further, as shown in Model 2 of Table 2, higher levels of maternal support at baseline are related to a modestly steeper increase in smoking over time. No other significant associations are found for support from parents on adult children's smoking or alcohol use. Additionally, we do not find any significant associations between support at baseline and any of the substance use intercepts.

4.2.3. Strain with parents—Finally, Table 2 also shows the effect of strain with parents on adult children's alcohol use (Model 1) and smoking (Model 2). In Table 2, we find two significant effects of baseline levels of mother and father strain on alcohol use (Model 1). First, higher levels of strain from mothers are related to more alcohol use at baseline. Second, higher levels of strain from fathers at baseline are associated with a modestly steeper decrease in drinking over time. Additionally, we find one significant effect regarding changes in levels of father strain on alcohol use (Model 1). Any change in fathers' strain (increase or decrease) is associated with a steeper increase in drinking over time relative to no change in strain from fathers. Finally, as shown in Model 2, an increase in strain from mothers is related to a modestly steeper decline in adult children's smoking over time relative to no change in strain from mothers.

4.3. Stratified by gender

Table 3 shows the models predicting smoking use stratified by gender (no significant effects for alcohol were found; available upon request). We only report the gender differences below that were confirmed to be statistically significant in interaction models (not shown). Stratified models, as well as models testing interactions between quality and contact measures and gender, reveal no significant differences between adult sons and adult daughters related to alcohol use, but six significant differences related to smoking. In each of these cases, we find that relationships with parents influence sons' smoking behaviors but not daughters'. The stratified models, supported by the interaction between gender and strain from mother, shows that strain from mothers at baseline increases the slope of smoking over time for sons only and an increase in strain from mothers fosters a more rapid decline in smoking over time for sons only. Additionally, more contact with mothers at baseline is related to a steeper decrease in smoking over time for sons only, and, further, a decrease in contact with mothers is also related to a steeper increase (or slower decrease) in smoking over time for sons only. Finally, more support from fathers at baseline is associated with more smoking at baseline as well as a steeper decrease in smoking over time for sons only.

5. Discussion

In this study, we draw on a multi-dimensional and dynamic view of the parent-child tie to examine the effects of the parent-child tie on two central corollaries of adult children's morbidity and mortality in adulthood—smoking and alcohol use. Our longitudinal growth curve models that track substance use over a 15-year period reveal that the adult parent-child tie is significant for children's alcohol and smoking trajectories long into adulthood, with contact, support, and strain mattering in unique and gendered ways. Findings show that contact with mothers in adulthood has a consistent and health-enhancing effect on sons' smoking, whereas contact with fathers is not related to children's substance use. Fathers' support is related to a decline in alcohol use, while both mothers' and fathers' support is related to a modest increase in smoking. Our findings for parental strain are inconsistent and complex, suggesting that the ways in which adult children cope and manage strain with parents may result in multiple pathways of substance use. Further, our results demonstrate that, regarding smoking, sons are more impacted by their relationships with parents than daughters. Taken together, results indicate the importance of utilizing longitudinal analyses to distinguish not only between different dimensions of the parent-child tie (i.e., contact, support, strain) but also between types of substance use and to consider the role of gender in the parent-adult child tie.

We first discuss the effects of contact with parents on the trajectories of children's alcohol use and smoking. Findings show that only contact with mothers, not contact with fathers, is related to sons', not daughters', smoking. Specifically, higher baseline levels of contact with mothers generally reduced sons' smoking over time, while lower initial levels and decreases in contact with mothers increased sons' smoking over time. Contact with mothers may provide more direct social control opportunities to regulate behavior that take effect across son's adulthood (Umberson, 1992). Additionally, contact may also improve the mothers' ability to convey and enact salient expectations and behavior norms (i.e., indirect social control) that in turn deter smoking among sons (Umberson, Pudrovska, et al., 2010). Less frequent contact and declines in contact over time may allow more time and freedom for sons to engage in smoking, perhaps due to a reduction in the salience of mothers' indirect and direct influences. Sons may be the recipient of social control, but not daughters, because sons are more likely to be smokers than daughters in adulthood and thus require more social regulation (Barbeau, Krieger, & Soobader, 2004). Contact with fathers is more limited for adult children (Kaufman & Uhlenberg, 1998), and this gendered difference in the provision of social control seems to be reflected in our finding that contact with fathers is not related to adult children's smoking or alcohol use. Our findings regarding contact are consistent with 4a—which suggested that mothers would be more influential than fathers—but inconsistent with Hypothesis 4b—which suggested that same-gender dyads would be most salient to children's substance use. Taken together, it appears contact with mothers likely has both short-term and long-term effects on son's smoking, wherein contact at baseline sets the trajectory for slow and consistent changes in smoking that take more salient effect over time.

Moving to the effects of support from parents, we hypothesized that higher and increasing levels of support would be associated with less substance use, while lower and decreasing levels of support would be associated with more substance use. We found that the effect of

support from fathers were consistent with this hypothesis. An increase in support from fathers was associated with a steeper decline in alcohol use over time for both sons and daughters. Moreover, for sons only, contact with fathers was associated with a steeper decline in smoking—suggesting that fathers' support over the long-term is beneficial for sons' smoking risk. Research shows that in adulthood, support from fathers is less common than support from mother (Raley & Bianchi, 2006). It may be that unanticipated or unique support from fathers may facilitate more effective stress-coping mechanisms to meet the demands of everyday and long-term stressors in ways that reduce the use of alcohol and cigarettes. Support from fathers may act as a buffer, creating an environment that positively cultivates lower risk of alcohol use and smoking (Ackard et al., 2006; Fingerman, Kim, Birditt, & Zarit, 2015). Fathers' support may also include financial support, potentially facilitating the resources to quit smoking or reduce drinking.

However, findings on support from mothers as well as one finding from support from fathers contradict Hypothesis 2. Results show that higher levels of maternal support at baseline is related to a modestly steeper increase in smoking over time for children and that more support from fathers at baseline was associated with more smoking at baseline for sons only (although note above that this effect reversed over the long-term). Higher levels of support from parents, especially at one point in time, may reflect adult children's *need* for support, perhaps due to a major or time-consuming chronic life event from an external stressor. While we control for some potential life stressors, we are unable to control for all potential significant stressors (e.g., divorce, death of a family member, birth of a child), which may act as confounders and account for this unexpected finding. Also, support from parents may act as a contagion (Christakis & Fowler, 2013), wherein support from parents may include the spreading of parents' potentially unhealthy coping mechanisms such as substance use. In this way, support from parents may entail encouragement to participate in smoking. Our findings regarding support are inconsistent with both 4a and 4b, as both mothers and fathers are influential on both sons' and daughter's substance use, although the connection between fathers' support and smoking was stronger for sons.

Finally, our findings for strain from parents suggest that the ways adult children cope and manage strain with parents may result in multiple pathways of substance use. In support of Hypothesis 3, strain from mothers is associated with an increase in sons' smoking over time, as well as more alcohol use at baseline for both sons and daughters. Additionally, any change in strain from fathers is associated with an increase in smoking over time for sons and daughters. Our findings are consistent with previous research that suggests that strain is an important element in relationships between parents and adult children as it is a contributor to stress and is negatively predictive of substance use (Uchino et al., 2012; Umberson et al., 2014). Strain with family members is strongly linked to psychological distress in accumulating ways (Pearlin, Schieman, Fazio, & Meersman, 2005; Repetti et al., 2002; Umberson, 1992), while psychological distress is in turn associated with higher rates of substance use over time (Laitinen et al., 2002; Repetti et al., 2002). Therefore, strain from parents is likely mostly a stress-inducer, wherein high levels of strain may lead to the use of substances by adult children in order to cope.

However, two findings are inconsistent with our strain hypothesis. An increase in strain from mothers is associated with a faster decline in smoking over time for sons only, while higher levels of strain from fathers at baseline is associated with less drinking over time among both sons and daughters. It may be that some adult children who experience persistent and chronic strain with parents learn to cope with and develop stress resistance from strain with mothers and fathers in ways that lead to a decline in substance use in adulthood. Similarly, the meaning and salience of strain with parents may change over time. Research shows that the parent-child tie is less salient as the adult child engages with other major social ties (e.g., spouse, one's own children) (Steinberg & Morris, 2001). As both generations age, the relationship between adult children and parents shifts from a primarily child-as-dependent relationship to a primarily parent-as-dependent relationship. This would suggest that strain in the parent-child relationship has different meaning and response over time as it relates to adult children's alcohol use and smoking. Alternatively, adult children's strain with parents may relate to parents' own substance use. For example, strain may be in response to a parents' problematic health behavior, and in turn may promote a reduction of this behavior in adult children (Glass, Prigerson, Kasl, & de Leon, 1995; Moos, Brennan, Schutte, & Moos, 2010). Strain with parents may inadvertently reduce children's substance use if the parent and child performed the behavior together; strain may lower the chance of unhealthy contagion (Christakis & Fowler, 2013).

Inconsistent with Hypothesis 4a which suggested mothers would be more important than fathers in shaping children's substance use, we find that strain from fathers and mothers both appears to shape the substance use of daughters and sons alike. Fathers are often overlooked in their influence on adult children (Ahrons & Tanner, 2003), but our findings suggest they should remain an important site of research. Because strong paternal relationships are less normative than maternal relationships (Lye, 1996), relationships with fathers are likely unexpected and may have more solemnity for health behavior (Doherty, Kouneski, & Erickson, 1998; LaRossa, Jaret, Gadgil, & Wynn, 2000; Ward et al., 2014). Yet we find no support for Hypothesis 4b— that strain in same-gender dyads would be the site of greater influence; instead, both mothers' and fathers' strain matter for children's substance use in different ways. Mothers' strain appear to shape children's, especially sons', smoking, perhaps because sons strain with mothers is a proxy for the emotional connection between mothers and sons that may affect feelings of stress, loneliness, and isolation (Alma et al., 2011) and in turn shaping trajectories of smoking. Strain with mothers may be especially important for sons, because they are more likely to have fewer social ties and everyday contact with those ties than daughters and thus be more susceptible to strain from mothers (Silverstein, Parrott, & Bengtson, 1995).

5.1. Limitations

This study's unique contributions to research on the parent-child tie and adult children's substance use using nationally representative longitudinal data should be considered within the context of several limitations. First, although we hypothesize that relationships with parents contribute to substance use, we cannot fully ascertain causality, even with longitudinal data. It is likely the case that substance use influences the degree of contact and quality of relationships with parents, especially at the baseline level (Pillemer & Suitor,

1991). One issue is that we only have two waves of data on the parent-child relationship; ideally, we would be able to consider the parent-child relationship measures over the total fifteen-year period and better test the short-term and long-term impacts of this relationship. Second, we measure change in the number of cigarettes and amount of alcoholic drinks rather than dichotomous variables or categorical variables because previous research that suggests any increase or decrease in these outcomes is predictive of health (Connor, 2016; Nelson et al., 2013; Room et al., 2005; Umberson et al., 2008). Our chosen measurements of substance use may not capture some important change in these components of health over time; for example, it may be that contact, support, and strain may shift alcohol use from light to heavy drinking (House, Umberson, & Landis, 1988). There may also be ceiling effects for some behaviors, wherein moderate substance use is most reactive to contact, support, and stress relative to those who, for example, drink and smoke heavily. Further research should explore the effects of parent-child ties on these substance use measures.

Fourth, it may be that frequency of contact matters more intensely when coupled with high levels of support or strain (Ailshire & Burgard, 2012). We examined interactions between frequency of contact, support, and strain and found no notable effects (available upon request). Fifth, we do not have measures of our proposed pathways for contact with parents, including contagion effects (e.g., parents' health behaviors). Considering parents' substance use is an important next step (Johannsen, Johannsen, & Specker, 2006). This may be a site of future research. Finally, sample attrition may be important to our results. It may be that individuals who have the most substance use, or most strain, least support, and least contact with parents may be more likely to drop out of the study due to mortality selection (either their own death or a parent's death) and other types of attrition (e.g., no relationship with parent even if living). The attrition of these individuals may in fact mean that our findings underestimate the effects of negative interactions with parents and substance use; however, these factors could also be confounded with other unobserved biases in the data.

6. Conclusion

In this study we examine baseline associations and trajectories of change over time in the relationship between the parent-child tie and adult children's substance use. We emphasize that the parent-child tie is multi-faceted and gendered, although in unexpected ways. Adult children's substance use is impacted by the quality of their relationship with their parents, both in early adulthood and continuing into mid-adulthood. This suggests that improving adult children's relationships with their parents may be one way to target risky substance use patterns. However, our research also suggests that the relationship between the adult child-parent tie and substance use is nuanced, and any proposed interventions should consider the complexities involved, including the gender of both of adult child and the parent, the type of substance use considered, and the measure of the relationship. We spotlight the need to look at the parent-child relationship as a dynamic social tie that changes over the life course with consequences for long-term health and successful aging. As the U.S. population continues to age and life expectancy increases, the parent-child tie will continue to be important to adult children's health. This study raises new questions about the influence of "good" and "bad" family ties as respectively "good" or "bad" for health, and suggests a more complex relationship between family ties and substance use than previously theorized.

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HIGHLIGHTS

- Research question: What are the long-term consequences of the parent-child relationship for adult children's substance use (i.e., smoking levels, low to moderate alcohol use)?
- Method: Latent growth curve analysis of national longitudinal survey data.
- Results: Contact with mothers in adulthood has a health-enhancing effect on sons' smoking. Fathers' support is related to a decline in alcohol use for sons and daughters, but also an increase in smoking for sons only. Strain from parents are complex, suggesting that the ways in which adult children cope and manage strain with parents may result in multiple pathways of substance use.
- Conclusion: Our study raises new questions about whether and when family ties are "good" or "bad" for health and calls for a more multifaceted view of the long-lasting parent-child tie. We spotlight the need to look at the parent-child relationship as a dynamic social tie that changes over the life course and has consequences for health in adulthood.

Table 1

Descriptive statistics by gender (means and standard deviations).

	Women ***N*** **= 511**	**Men** ***N*** **= 396**
Age at Wave 1 (years)	34.26*	33.45
	(5.83)	(5.62)
Black (ref = other)	0.39***	0.27
Education (years completed)	12.69***	13.36
	(2.47)	(2.59)
Currently married	0.51***	0.62
Total family income	24,541.97***	29,451.94
	(19,076.89)	(19,039.28)
Childhood stress	0.51*	0.38
	(0.84)	(0.73)
Mother frequency of contact:		
2 or more times a month	0.87*	0.81
Father frequency of contact:		
2 or more times a month	0.75	0.74
Mother support (2–10; Wave 1)	8.90	8.85
	(1.65)	(1.43)
Father support (2–10; Wave 1)	8.07	8.26
	(2.04)	(1.72)
Mother strain (2–10; Wave 1)	3.99	4.17
	(2.07)	(1.99)
Father strain (2–10; Wave 1)	3.59**	3.97
	(1.97)	(2.03)
Cigarette smoking (number of cigarettes per day)	6.45**	7.24
(wave 1)	(11.30)	(11.84)
Cigarette smoking (number of cigarettes per day)	5.30	6.36
(wave 2)	(9.75)	(11.23)
Cigarette smoking (number of cigarettes per day)	1.48	1.94
(wave 3)	(4.13)	(5.87)
Cigarette smoking (number of cigarettes per day)	3.44	4.16
(wave 4)	(8.06)	(9.43)
Alcohol use (number of drinks consumed last month)	9.84***	31.19
(wave 1)	(23.00)	(51.84)
Alcohol use (number of drinks consumed last month)	8.19***	22.08
(wave 2)	(21.56)	(32.37)
Alcohol use (number of drinks consumed last month)	4.71***	21.01
(wave 3)	(9.54)	(40.28)
Alcohol use (number of drinks consumed last month)	5.46***	23.74
(wave 4)	(10.96)	(47.22)

Significant gender difference within sample indicated by ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Table 2

Latent growth curve estimates of the effects of relationships with mothers and fathers on substance use (N = 907).

	Model 1 Alcohol use (log)		Model 2 Smoking (log)	
Variables	**Intercept**	**Slope**	**Intercept**	**Slope**
Contact with mother (two times a month or more) (T1)	0.107	0.002	0.391	−0.045*
	(0.293)	(0.023)	(0.316)	(0.018)
Decrease in contact with mother (T1–T2)		0.028		0.025*
		(0.017)		(0.012)
Increase in contact with mother (T1–T2)		0.026		0.011
		(0.016)		(0.012)
Contact with father (two times a month or more) (T1)	−0.112	0.016	−0.242	0.011
	(0.249)	(0.019)	(0.269)	(0.016)
Decrease in contact with father (T1–T2)		−0.007		0.003
		(0.017)		(0.012)
Increase in contact with father (T1–T2)		−0.013		−0.002
		(0.016)		(0.011)
Mother support (T1)	0.016	0.002	−0.076	0.013**
	(0.064)	(0.005)	(0.070)	(0.004)
Decrease in mother support (T1–T2)		−0.011		0.012
		(0.017)		(0.012)
Increase in mother support (T1–T2)		−0.014		−0.015
		(0.016)		(0.011)
Father support (T1)	0.043	0.002	0.061	−0.006
	(0.052)	(0.004)	(0.056)	(0.004)
Decrease in father support (T1–T2)		−0.022		0.001
		(0.017)		(0.012)
Increase in father support (T1–T2)		−0.047**		−0.004
		(0.016)		(0.012)
Mother strain (T1)	0.106*	−0.003	0.014	0.007
	(0.049)	(0.004)	(0.054)	(0.003)
Decrease in mother strain (T1–T2)		−0.002		0.003
		(0.015)		(0.011)
Increase in mother strain (T1–T2)		0.000		−0.023*
		(0.016)		(0.012)
Father strain (T1)	−0.029	−0.011**	−0.007	−0.002
	(0.048)	(0.004)	(0.052)	(0.003)
Decrease in father strain (T1–T2)		0.042**		−0.004
		(0.015)		(0.011)
Increase in father strain (T1–T2)		0.035*		0.016
		(0.017)		(0.012)

	Model 1 Alcohol use (log)		Model 2 Smoking (log)	
Variables	**Intercept**	**Slope**	**Intercept**	**Slope**
Intercepts	0.889	−0.171**	−0.751	−0.156**
	(0.730)	(0.064)	(0.795)	(0.051)
Residual Variance	3.997***	0.011***	5.295***	0.005***
	(0.282)	(0.002)	(0.332)	(0.001)
χ^2 (df)	χ^2 (67) = 81.520		χ^2 (67) = 275.782	

Significant gender difference within sample indicated by ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Models control for age at baseline, gender (0 = adult daughter; 1 = adult son), race (0 = other; 1 = African American), education at baseline (measured in number of years), marital status at baseline (0 = currently unmarried; 1 = currently married), income of adult child respondents at baseline (in $1000 s), and childhood stress.

Table 3

Latent growth curve estimates of the effects of relationships with mothers and fathers on smoking, stratified by gender (N = 511 women and 396 men).

	Smoking (log)			
	Women		Men	
Variables	**Intercept**	**Slope**	**Intercept**	**Slope**
Contact with mother (two times a month or more) (T1)	0.040	−0.013	0.601	−0.073*
	(0.417)	(0.025)	(0.519)	(0.029)
Decrease in contact with mother (T1–T2)		0.008		0.055**
		(0.016)		(0.019)
Increase in contact with mother (T1–T2)		0.009		0.025
		(0.015)		(0.019)
Contact with father (two times a month or more) (T1)	−0.287	0.018	−0.173	0.016
	(0.324)	(0.019)	(0.486)	(0.027)
Decrease in contact with father (T1–T2)		0.007		−0.016
		(0.015)		(0.021)
Increase in contact with father (T1–T2)		0.008		−0.022
		(0.015)		(0.017)
Mother support (T1)	0.014	0.012*	−0.197	0.007
	(0.088)	(0.006)	(0.113)	(0.007)
Decrease in mother support (T1–T2)		0.007		0.014
		(0.016)		(0.019)
Increase in mother support (T1–T2)		−0.023		0.002
		(0.014)		(0.017)
Father support (T1)	−0.020	−0.003	0.195*	−0.012*
	(0.070)	(0.004)	(0.094)	(0.006)
Decrease in father support (T1–T2)		0.005		−0.008
		(0.016)		(0.018)
Increase in father support (T1–T2)		−0.001		−0.018
		(0.015)		(0.018)
Mother strain (T1)	0.073	−0.002	−0.052	0.022***
	(0.069)	(0.004)	(0.084)	(0.005)
Decrease in mother strain (T1–T2)		−0.002		0.005
		(0.014)		(0.017)
Increase in mother strain (T1–T2)		−0.008		−0.054**
		(0.015)		(0.017)
Father strain (T1)	−0.059	−0.001	0.067	−0.005
	(0.067)	(0.004)	(0.082)	(0.005)
Decrease in father strain (T1–T2)		−0.004		−0.012
		(0.015)		(0.016)
Increase in father strain (T1–T2)		0.014		0.010

	Smoking (log)			
	Women		Men	
Variables	**Intercept**	**Slope**	**Intercept**	**Slope**
		(0.017)		(0.017)
Intercepts	−1.599	−0.131*	−0.763	−0.119
	(0.877)	(0.059)	(1.214)	(0.075)
Residual Variance	4.985***	0.005**	5.487***	0.001
	(0.413)	(0.002)	(0.530)	(0.002)
χ^2 (df)	χ^2 (65) = 190.605		χ^2 (65) = 148.536	

Significant gender difference within sample indicated by ***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Underlined if models testing interactions between quality and contact measures and gender indicated statistically significant differences ($p < .05$) between adult sons and adult daughters.

Models control for age at baseline, gender (0 = adult daughter; 1 = adult son), race (0 = other; 1 = African American), education at baseline (measured in number of years), marital status at baseline (0 = currently unmarried; 1 = currently married), income of adult child respondents at baseline (in $1000 s), and childhood stress.