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## Parent and Grandparent Marijuana Use and Child Substance Use and Norms

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### Abstract

**Purpose**—Using prospective longitudinal data from 3 generations, this study seeks to test whether and how parent and grandparent marijuana use (current and prior) predicts an increased likelihood of child cigarette, alcohol, and marijuana use.

**Methods**—Using multilevel modeling of prospective data spanning 3 generations (N = 306 families, children ages 6-22), this study tested associations between grandparent (G1) and parent (G2) marijuana use and child (G3) past-year cigarette, alcohol, and marijuana use. Analyses tested whether G3 substance-related norms mediated these associations. Current G1 and G2 marijuana use was examined, as was G2 high school and early adult use and G1 marijuana use when G2 parents were in early adolescence. Controls included G2 age at G3 birth, G2 education and depression, and G3 gender.

**Results**—G2 current marijuana use predicted a higher likelihood of G3 alcohol and marijuana use, but was not related to the probability of G3 cigarette use. G3's perceptions of their parents' norms and G2 current marijuana use both contributed independently to the likelihood of G3 alcohol and marijuana use when included in the same model. G3 children's own norms and their perceptions of friends' norms mediated the link between G2 current marijuana use and G3 alcohol and marijuana use.

**Conclusions**—Results are discussed in light of the growing trend toward marijuana legalization. To the extent that parent marijuana use increases under legalization, we can expect more youth to use alcohol and marijuana and to have norms that favor substance use.

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## Keywords

Marijuana; Cigarettes; Alcohol; Norms; Parent; Grandparent

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Prior literature has demonstrated that substance misuse during adolescence increases risk for a range of negative outcomes, making prevention of youth substance use a public health priority. Youth cigarette, alcohol, and marijuana use, particularly if frequent, heavy, or persistent, are associated with increased risk for later dependence, justice system involvement, motor vehicle accidents, poor health, lower academic attainment and income, and other problems [1-3].

Given that substance use by family members and social norms around substance use are important predictors of youth substance use [4-6], the growing trend toward legalization of adult non-medical marijuana use in U.S. states may complicate youth substance use prevention if parent and other family member marijuana use increases and social norms become more permissive toward marijuana. To inform the national discussion about non-medical marijuana legalization, the present study used prospective, longitudinal data from 3 generations to examine the association between parent and grandparent marijuana use and child cigarette, alcohol, and marijuana use and substance-related norms. Analyses tested whether the link between parent and grandparent marijuana use and child substance use is explained by youth norms favorable to substance use. Results are interpreted through the lens of marijuana legalization.

## Parent and Grandparent Marijuana Use

A large body of studies shows a link between parent and child substance use [4,5,7,8], including marijuana use [9,10]. Studies of the association between parent and offspring substance use typically have looked at either “current” or “lifetime” substance use by parents without regard to the timing of use in the parent's life course. Both of these conceptualizations of parental substance use have yielded valuable findings, yet the timing of parental substance use also may be important. Parent substance use during key periods in their own development, like high school or the transition to adulthood, also may be related to offspring substance use by influencing the environment in which children are raised. For example, using data from the present samples, Bailey and colleagues [11] found that parent illicit drug use disorder in the transition to adulthood was linked with low parent educational attainment, low parent social skills, poor parent physical health, and impaired parenting practices at age 27. Thus, the present study included measures of parent current marijuana use, as well as marijuana use during high school and at ages 21-24.

Grandparents are important not only in the developmental history of parents, but also frequently in the lives of their grandchildren, suggesting the potential for both direct and indirect effects of grandparent marijuana use on their grandchildren's substance use. Prospective, 3-generation studies looking at the influence of grandparent substance use on grandchild use are rare because they require long-term longitudinal studies. However, a number of retrospective or cross-sectional studies have identified that having a family history of substance use among close relatives, including grandparents, is predictive of youth

substance use and its antecedents [12,13]. The current study is one of the first to use prospective, longitudinal data from grandparents to predict child substance use.

## Social Norms

Theory and empirical research support a link between social norms and substance use in general, and marijuana use in particular [14,15]. Theoretical models emphasizing social learning and social control, including social learning theory and the social development model, identify norms and expectancies as among the key drivers of substance use [16,17]. According to empirical research, personal norms and norms among social reference groups like parents, peers, siblings, and romantic partners are strongly predictive of youth drug behaviors [14,18].

Youth norms are themselves influenced by parent substance use. For example, prior studies have linked parent cigarette smoking to children's perceived parental approval, perceived peer norms, and own norms about smoking [19,20]. Few studies have looked at parent marijuana use or tested whether youth norms around substance use mediate the association between parent marijuana use and child substance use. One study used U.S. national data [21] and found that youth whose parents used marijuana more recently reported fewer negative marijuana expectancies, lower expectations of punishment for use, and more pro-marijuana norms. These youth norms mediated the link between parent marijuana use and child marijuana initiation. Information about the potential role of grandparent substance use in influencing child norms is lacking.

This study extends existing work by testing links between parent and grandparent marijuana use and child cigarette, alcohol, and marijuana use using prospective data from 3 generations. It further builds on prior studies by considering grandparents as well as parents and historical as well as current parent and grandparent substance use, and by testing mediation of these potential influences on child substance use via child norms.

## Methods

### Participants and Procedure

Data were drawn from 2 linked, longitudinal research projects: the Seattle Social Development Project (SSDP) and The SSDP Intergenerational Project (TIP). SSDP is a panel study of youth pro- and antisocial behavior. TIP follows the children of SSDP participants, and uses an accelerated longitudinal design to examine links between parent (G2) and grandparent (G1) substance use and child (G3) development. SSDP began in 1985, and included 808 students (G2), or 77% of the eligible population of fifth grade students in the 18 participating public elementary schools [22]. Students were followed from fifth grade (age 10) to age 39 (in 2014). One parent per family (G1, usually the mother) was surveyed annually when G2 students were ages 10-16. The present study used G2 data collected in high school (ages 15, 16, and 18) and young adulthood (ages 21 and 24) and G1 data collected when G2 were ages 13-14. G2 retention was between 92% and 97% for the data points used here. Nonparticipation at each assessment was not consistently related to G2 gender, ethnicity, or early initiation of alcohol, tobacco, marijuana, or other illicit drug use.

TIP began data collection in 2002, and included those SSDP participants who had become parents (G2) and the oldest biological child (G3) with whom they had regular contact [23]. A second caregiver nominated by the SSDP participant also was included when relevant. Eligible SSDP G2s had face-to-face contact with their G3 child on at least a monthly basis. New families were included in the sample as SSDP participants became parents for the first time. Seven waves of data have been collected from 383 TIP families. At the first data collection (wave 1, 2002), SSDP G2s averaged 27 years of age, and G3 children ranged in age from 1 to 13 years. By wave 7 (2011), SSDP G2s averaged 36 years of age, and G3 children ranged in age from 1-22 years. Data collection was timed to occur within 6 weeks of the G3 child's birthday each year. Table 1 shows additional sample demographic data.

Recruitment of eligible families into TIP averaged 82% across waves, and retention from wave to wave averaged 90%. G2 SSDP mothers and married parents were consistently more likely to meet eligibility criteria (regular, face-to-face contact with G3) than SSDP fathers and unmarried SSDP parents. Once eligible, families were slightly less likely to be recruited if the G2 parent was Asian American or was eligible for the National Free School Breakfast/Lunch program in grades 5-7. Retention was not consistently related to G2 gender; marital status; TANF receipt; cigarette use, marijuana use, or binge drinking at TIP baseline; free lunch eligibility in childhood; cigarette use, marijuana use, or binge drinking in high school; or race/ethnicity. Procedures and measures for SSDP and TIP were approved by the University of Washington Institutional Review Board.

## Measures

**G2 marijuana use**—*G2 current marijuana use* was self-reported by SSDP parents and second caregivers in each wave of TIP. Parents and caregivers each reported the frequency of their marijuana use in the month prior to the interview. Frequency greater than 30 was rare, so responses were recoded to 0-30+. When 2 caregivers were present, use frequencies were averaged across parents at each wave. *G2 early adult marijuana use* and *G2 high school marijuana use* were prospectively self-reported by SSDP parents. Measures of second caregiver marijuana use in young adulthood and high school were unavailable, because these individuals were not a part of the SSDP study. At each young adult and high school assessment, SSDP participants reported the frequency of their marijuana use in the month prior to the interview (range 0-30). Marijuana use frequency was averaged across ages 21 and 24 (early adult) and across ages 15, 16, and 18 (high school).

**G1 marijuana use**—*G1 current marijuana use* was reported by G2, who reported whether their mother or father regularly used marijuana (yes/no). If either G2 parent reported that their mother or father used regularly, then *G1 current marijuana use* was coded as 1 (otherwise 0). *G1 historical marijuana use* was self-reported when SSDP G2 participants were age 13 and 14. One grandparent reported on their own and their partner's frequency of marijuana use. Responses were coded as 0 *never*, 1 *less than once a month*, and 2 *once a month or more*, and were averaged across partners and across years.

**G3 norms** were assessed beginning at age 10. A measure of the child's *own norms* about cigarettes, alcohol, and marijuana (each assessed separately) combined 12 items on

acceptability of use, perceived harm, and expectancies. Cronbach's alpha averaged .65 across waves 1-7; reliability was strong in later waves, but was lower at earlier waves due to low variability, especially on items about cigarettes. Most G3 children had strong antismoking norms in early waves (when they were, on average, younger). A 2-item measure of *perceived parent norms* assessed perceived G2 acceptance of cigarette and alcohol use. Perceived parental attitudes about marijuana were not assessed. Questions were asked about both the SSDP parent and, when present, the second caregiver. Where 2 caregivers were present, items were averaged across caregivers. A measure of G3's *perceived peer norms* included 3 items assessing perceived acceptability of cigarette, alcohol, and marijuana use, respectively, among the child's friends. Cronbach's alpha averaged .89 across waves 1-7.

**G3 substance use**—Measures of cigarette and alcohol use began at age 6. Measures of marijuana use began at age 10. At each wave, G3s reported (separately) the number of times they used alcohol, cigarettes, and marijuana in the past year. For each drug, responses were recoded to indicate any use in the past year (dichotomous 1 *yes*, 0 *no*).

**Control variables**—*G3 age* at each wave of TIP was calculated based on the child's birthdate. *G2 age at birth of child* was calculated by comparing the birthdates of the SSDP parent and the child. Because G2 parents had their first child at different ages and some G2s were parenting at ages 21 and 24 (when young adult marijuana use was measured), it was important to control for their age when the child was born. *Parent education* indexed the highest education level of the G2 parent or second caregiver (if present). *G3 prenatal exposure* to drugs was based on biological mother reports of cigarette, alcohol, marijuana, or other illicit drug use while pregnant. Some families (~20%) did not include the biological mother and were missing this information. *G3 gender* was reported by G2. A measure of *G2 early adult depression* averaged the number of DSM-IV [24] depression symptoms at ages 21 and 24 reported by SSDP parents using the Diagnostic Interview Schedule [25]. G2s marijuana use is related to cigarette and heavy alcohol use in this sample [26]. In order to strengthen attributions about parent marijuana use specifically, we included measures of G2 *current cigarette use* and *binge drinking*. At each wave of TIP, G2s reported their frequency of cigarette use (1 *Not at all* to 5 *About a pack a day or more*) and binge drinking (5 or more drinks in a row; range 0-30 occasions) in the month prior to the interview. Cigarette use and binge drinking, respectively, were averaged across caregivers.

## Analysis

The study's accelerated longitudinal design allows examination of developmental changes over a broader age span than is possible in a traditional panel study of similar duration [27]. Aligning the overlapping birth cohorts by age allowed us to examine developmental change in G3 outcomes from ages 10 to 22 for norms and marijuana use and from ages 6 to 22 for cigarette and alcohol use. Analyses used multilevel modeling (HLM for Windows 6.08) [28] to account for the nesting of observations within person and to test cohort effects [29,30]. No significant between-cohort differences in the developmental pattern of the child outcomes were found [27]; cohorts were combined for analysis.

In preliminary analyses, neither G1 current marijuana use nor G3 prenatal exposure to substances predicted any of the G3 substance use outcomes. These variables were dropped from subsequent analyses. A series of 3 models tested whether current and historical G2 and historical G1 marijuana use predicted G3 cigarette, alcohol, and marijuana use, and included controls for G2 current cigarette use and binge drinking. A final set of models tested whether G3 norms mediated the association between G1 and G2 marijuana use and child substance use.

## Results

### G3 Substance Use

About 26% of G3 children reported any alcohol use, 17% reported any cigarette use, and 24% reported any marijuana use across the 7 waves of data collection. Table 2 shows the results of multilevel models testing the link between G1 and G2 marijuana use variables and G3 past-year cigarette, alcohol, and marijuana use. None of the G1 or G2 marijuana use variables predicted child past-year cigarette use; however, G2 current cigarette use was positively related to child cigarette use. Higher values on G2 education and depression were associated with a slower rate of increase in the probability of child cigarette use over time.

Results for models predicting child alcohol and marijuana use were similar to each other. G1 and G2 *historical* marijuana use did not predict either child alcohol or marijuana use. G2 *current* marijuana use, however, was positively related to the probability of child past-year alcohol and marijuana use, respectively, even when G2 current cigarette use and binge drinking were controlled. G2 current cigarette use also predicted child marijuana use. Female children had a higher likelihood of alcohol and marijuana use at the intercept (age 10), but showed slower rates of increase in the probability of use over time than male children.

### Mediation Models

Table 3 shows the results of models testing whether child norms mediate the links between G2 marijuana use and the probability of child past-year alcohol and marijuana use. Because G1 and G2 marijuana use variables were unrelated to child cigarette use, mediation models were not tested for child cigarette use. Model 1 tested mediation by children's own norms, Model 2 tested mediation by perceived G2 norms, and Model 3 tested mediation by perceived peer norms.

Children's own norms and their perception of peer norms mediated the associations between G2 current marijuana use and both G3 alcohol and marijuana use. Perceived G2 pro-use norms predicted a higher likelihood of both child alcohol and marijuana use, but did not mediate the association between G2 current marijuana use and either G3 substance use outcome. In all 3 alcohol models, children of older parents were less likely and female children were more likely to use alcohol at the intercept. In alcohol Models 2 and 3, female children showed a slower increase in the probability of alcohol use over time than male children. In marijuana Models 2 and 3, female children had a higher probability of



marijuana use at the intercept, and in all 3 marijuana models, female children showed a slower rate of increase over time in the probability of marijuana use than males.

## Discussion

This study used prospective, longitudinal data from 3 generations to test whether G1 and G2 current and historical marijuana use predicted G3 past-year cigarette, alcohol, and marijuana use and child pro-substance use norms. In addition, models tested whether G3 norms mediated the observed links between G2 marijuana use and child substance use.

A large body of prior literature shows an association between parent and child substance use [4,5,7-10,31]; however, the developmental timing of parent substance use was not typically a focus in prior work. In this study, G2 current—but not historical—marijuana use predicted an increased likelihood of G3 alcohol and marijuana use. This suggests that proximal marijuana-using behavior by parents may be what influences adolescents in their decision to use alcohol and marijuana. The finding that the influence of G2 marijuana use was mediated by G3 norms is consistent with models of youth substance use focused on social control and the notion that norms are a key driver of youth substance use [16,17]. The present results suggest that marijuana use specifically was related to child substance use, as opposed to the counter hypothesis that simply having parents who used any drug would predict child substance use.

G2 current cigarette use (but not marijuana use) predicted G3 cigarette smoking in the present sample. It may be that parental influences on child cigarette use are substance-specific. For example, past analyses of this 3-generation sample showed that cigarette use specifically (but not marijuana or heavy alcohol use) showed continuity from G1 to G2 over and above continuity of a general tendency to use drugs [26]. These findings underscore the importance of reducing rates of smoking among parents as a means of reducing rates of smoking among youth.

Analyses did not support a role for G1 current or historical marijuana use in predicting G3 substance use. These results are not consistent with prior family history studies showing elevated substance use among grandchildren of substance users [12,13]. This may be because many family history studies have focused on more severe substance use (abuse and dependence), which may be more likely to influence subsequent generations or have a genetic component. Another potential explanation is that the influence of grandparent marijuana use emerges later in adolescence or adulthood. Further research testing links between grandparent substance use and grandchild substance use across late adolescence and adulthood would be informative.

## Strengths and Limitations

One limitation of this study was that G1 self-reports of *current* marijuana use were not available. Instead, G2 reports of G1 current use were used. G1 self-reports of current use may have been more predictive. A second limitation was that second caregiver historical substance use measures were not included, since these individuals were not part of the SSDP study. A third limitation was the somewhat low reliability of child norms measures assessed

at early ages. Still, these scales were significantly associated with child substance use, demonstrating that they did capture useful variance. A fourth limitation is that, although the pattern of results is consistent with directional hypotheses whereby parent use influences child norms, which then influence child use, the present analyses of concurrent measures preclude conclusions about causal order. Fifth, results will generalize most clearly to families where parents have some degree of face-to-face contact with their child. Finally, both parents and grandparents pass on their DNA to children, but genetic mechanisms were not tested here. These limitations are balanced by substantial strengths. The present study used prospective, longitudinal data spanning 3 generations. Three-generation studies are rare, yet they can provide important information about the intergenerational transmission of substance use. Other strengths included consideration of both current and historical substance use by family members, inclusion of grandparents, and testing of mediating mechanisms.

### **Implications of Marijuana Legalization**

Since wave 7 TIP data were collected in 2012, 4 U.S. states have legalized non-medical marijuana use for adults age 21 and older; other states are poised to follow. “Adults” of course includes parents. Many preventionists hypothesize that legalization of adult non-medical marijuana use will lead to earlier initiation, increased prevalence, and increased frequency of use among youth, even though use remains illegal for them [32-35]. This is because legalization of adult marijuana use may impact several known risk factors for youth marijuana and other drug use, including parent marijuana use and social norms about drug use. Based on the results of this study, increases in parent marijuana use under legalization may plausibly be accompanied by increases in youth marijuana and alcohol use, pro-substance use norms, and perceptions of peers as having pro-substance use norms.

There is little empirical information to date about the impact of legalization of non-medical marijuana on adult use and youth norms. In early data from Washington State, parents and youth report that marijuana legalization had little effect on their perceptions about the acceptability of adult and teen use or on their self-reported likelihood to use [36]. Data from the National Survey on Drug Use and Health show statistically significant increases in marijuana use among adults in Washington and Colorado from 2011/2012 to 2012/2013 (from ~12% to 14%-15% prevalence of past-month use) [37], as well as an increase in marijuana use among U.S. adults nationally in 2014 versus 2002-2013 [38]; any relationship to marijuana legalization has yet to be established. Although the extent to which rates of parent marijuana use may change under legalization remains unclear, empirical data and monitoring are critically needed in order to understand the implications of marijuana legalization for youth substance use and to inform state and national marijuana policy.

### **Supplementary Material**

Refer to Web version on PubMed Central for supplementary material.



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### Implications and Contribution

This study used prospective, 3-generation data to test whether parent and grandparent marijuana use predicts child substance use. Parent current marijuana use increased the probability of child alcohol and marijuana use, implying that increases in parent use under marijuana legalization may increase the likelihood of youth alcohol and marijuana use.

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**Table 1**  
**Sample demographic information**

| <b>Demographic variable</b>                             | <b>Prevalence (%)/ Median</b> |
|---|-------------------------------|
| G3 race/ethnicity                                       |                               |
| Caucasian   | 35%                           |
| African American  | 16%                           |
| More than one race                                      | 36%                           |
| Asian/Pacific Islander                                  | 11%                           |
| Native American   | 3%                            |
| Hispanic <sup>a</sup>                                   | 12%                           |
| G3 female   | 49%                           |
| G2 parent race/ethnicity                                |                               |
| Caucasian   | 41%                           |
| African American  | 23%                           |
| More than one race                                      | 13%                           |
| Asian/Pacific Islander                                  | 19%                           |
| Native American   | 4%                            |
| Hispanic <sup>a</sup>                                   | 7%                            |
| G2 female   | 60%                           |
| Median family income in 2010                            | \$55,001 - \$60,000           |
| G2 eligible for free/reduced school lunch in grades 5-7 | 52%                           |

<sup>a</sup>Hispanic is not mutually exclusive with racial categories.

Percentages may sum to greater than 100% due to rounding.

**Table 2**  
**Results from multilevel models predicting G3 past-year substance use**

| Parameter                           | Cigarette Use<br>N = 306 |       | Alcohol Use<br>N = 306 |       | Marijuana Use<br>N = 216 |       |
|-------------------------------------|--------------------------|-------|------------------------|-------|--------------------------|-------|
|                                     | B                        | SE    | B                      | SE    | B                        | SE    |
| Initial level at age 10 (intercept) | -4.639                   | 3.624 | -2.342                 | 4.260 | -15.114                  | 8.588 |
| Time-fixed predictors of intercept  |                          |       |                        |       |                          |       |
| SSDP G2 age at child birth          | -0.190                   | 0.185 | -0.357                 | 0.209 | -0.032                   | 0.370 |
| G2 education                        | 0.808                    | 0.438 | 0.605                  | 0.382 | 0.829                    | 0.581 |
| G3 female                           | 0.553                    | 0.935 | <b>3.028*</b>          | 1.063 | <b>4.336*</b>            | 1.622 |
| SSDP G2 depression at age 24        | 0.301                    | 0.169 | -0.070                 | 0.187 | 0.198                    | 0.281 |
| G1 historical MJ use                | 0.616                    | 1.193 | 1.283                  | 1.017 | 2.052                    | 1.514 |
| SSDP G2 high school MJ use          | -0.189                   | 0.337 | 0.191                  | 0.126 | -0.331                   | 0.390 |
| SSDP G2 early adult MJ use          | -0.102                   | 0.114 | 0.050                  | 0.080 | -0.085                   | 0.193 |
| G3 Age (slope)                      | 0.238                    | 0.943 | 0.398                  | 0.960 | 3.002                    | 1.761 |
| G3 Age2                             | -0.003                   | 0.027 | -0.045                 | 0.028 | <b>-0.162*</b>           | 0.057 |
| Time-fixed predictors of slope      |                          |       |                        |       |                          |       |
| SSDP G2 age at child birth          | 0.031                    | 0.042 | 0.055                  | 0.041 | 0.008                    | 0.065 |
| G2 education                        | <b>-0.136*</b>           | 0.067 | -0.060                 | 0.057 | -0.079                   | 0.086 |
| G3 female                           | 0.048                    | 0.140 | <b>-0.456*</b>         | 0.155 | <b>-0.736*</b>           | 0.239 |
| SSDP G2 depression at age 24        | <b>-0.055*</b>           | 0.026 | 0.005                  | 0.026 | -0.024                   | 0.040 |
| G1 historical MJ use                | -0.092                   | 0.178 | -0.167                 | 0.143 | -0.250                   | 0.219 |
| SSDP G2 high school MJ use          | 0.007                    | 0.047 | -0.028                 | 0.021 | 0.053                    | 0.052 |
| SSDP G2 early adult MJ use          | 0.030                    | 0.019 | -0.008                 | 0.014 | 0.006                    | 0.032 |
| Time-varying covariates             |                          |       |                        |       |                          |       |
| G2 current MJ use                   | 0.054                    | 0.032 | <b>0.078*</b>          | 0.026 | <b>0.062*</b>            | 0.031 |
| G2 current CIG use                  | <b>0.350*</b>            | 0.177 | 0.191                  | 0.136 | <b>0.428*</b>            | 0.156 |
| G2 current BINGE                    | 0.064                    | 0.259 | -0.648                 | 0.346 | -0.073                   | 0.334 |

\*  $p < .05$ .

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MJ = marijuana; CIG = cigarette; BINGE = binge drinking; G1 = grandparent; G2 = parent; G3 = child.

G3 reports of marijuana use began at age 10, whereas cigarette and alcohol use reports began at age 6. Therefore, the sample size for the marijuana use analysis is smaller.



**Table 3**  
**Results from multilevel models testing G3 norms as mediators of the association between G2 marijuana use and G3 substance use (N = 216)**

| Parameter                           | Alcohol Use    |       |                |       |                |       | Marijuana Use  |       |                |       |                |       |
|-------------------------------------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|
|                                     | Model 1        |       | Model 2        |       | Model 3        |       | Model 1        |       | Model 2        |       | Model 3        |       |
|                                     | B              | SE    | B              | SE    | B              | SE    | B              | SE    | B              | SE    | B              | SE    |
| Initial level at age 10 (intercept) | -0.675         | 4.154 | 0.723          | 4.353 | 1.558          | 4.263 | -10.682        | 7.880 | -11.622        | 8.299 | -8.770         | 8.324 |
| Time-fixed predictors of intercept  |                |       |                |       |                |       |                |       |                |       |                |       |
| SSDP G2 age at child birth          | <b>-0.430*</b> | 0.206 | <b>-0.461*</b> | 0.214 | <b>-0.450*</b> | 0.212 | -0.174         | 0.351 | -0.115         | 0.368 | -0.182         | 0.373 |
| G2 education                        | 0.429          | 0.364 | 0.457          | 0.374 | 0.460          | 0.368 | 0.598          | 0.569 | 0.554          | 0.578 | 0.583          | 0.593 |
| G3 female                           | <b>2.522*</b>  | 0.991 | <b>2.881*</b>  | 1.028 | <b>2.488*</b>  | 1.022 | 2.899          | 1.511 | <b>3.815*</b>  | 1.591 | <b>3.276*</b>  | 1.637 |
| SSDP G2 depression at age 24        | -0.219         | 0.194 | -0.046         | 0.188 | -0.247         | 0.198 | -0.031         | 0.285 | 0.241          | 0.279 | 0.013          | 0.285 |
| G1 historical MJ use                | 0.940          | 1.059 | 1.089          | 1.016 | 1.283          | 1.005 | 1.734          | 1.468 | 1.867          | 1.451 | 2.262          | 1.398 |
| SSDP G2 high school MJ use          | <b>0.222*</b>  | 0.110 | 0.208          | 0.115 | 0.205          | 0.113 | -0.103         | 0.388 | -0.265         | 0.384 | -0.313         | 0.425 |
| SSDP G2 early adult MJ use          | 0.093          | 0.078 | 0.062          | 0.080 | 0.102          | 0.078 | 0.033          | 0.162 | -0.033         | 0.172 | 0.042          | 0.169 |
| G3 age (slope)                      | -0.184         | 0.964 | -0.337         | 1.011 | -0.584         | 0.992 | 1.728          | 1.664 | 2.374          | 1.712 | 1.590          | 1.727 |
| G3 age <sup>2</sup>                 | -0.028         | 0.029 | -0.031         | 0.030 | -0.012         | 0.030 | <b>-0.114*</b> | 0.054 | <b>-0.144*</b> | 0.054 | <b>-0.113*</b> | 0.056 |
| Time-fixed predictors of slope      |                |       |                |       |                |       |                |       |                |       |                |       |
| SSDP G2 age at child birth          | .057           | .041  | 0.077          | 0.043 | 0.063          | 0.042 | 0.018          | 0.063 | 0.020          | 0.065 | 0.026          | 0.066 |
| G2 education                        | -0.029         | .056  | -0.029         | 0.057 | -0.017         | 0.057 | -0.047         | 0.084 | -0.038         | 0.086 | -0.030         | 0.089 |
| G3 female                           | <b>-0.333*</b> | .145  | <b>-0.411*</b> | 0.151 | <b>-0.349*</b> | 0.150 | <b>-0.496*</b> | 0.225 | <b>-0.647*</b> | 0.234 | <b>-0.580*</b> | 0.244 |
| SSDP G2 depression at age 24        | .036           | .028  | -0.147         | 0.144 | 0.034          | 0.029 | 0.026          | 0.040 | -0.029         | 0.039 | 0.009          | 0.041 |
| G1 historical MJ use                | -.148          | .149  | -0.029         | 0.020 | -0.192         | 0.141 | -0.259         | 0.216 | -0.211         | 0.211 | -0.292         | 0.202 |
| SSDP G2 high school MJ use          | -.035          | .018  | -0.012         | 0.014 | -0.035         | 0.020 | 0.017          | 0.051 | 0.046          | 0.052 | 0.050          | 0.058 |
| SSDP G2 early adult MJ use          | -0.014         | .014  | 0.002          | 0.027 | -0.016         | 0.013 | -0.011         | 0.027 | -0.004         | 0.028 | -0.013         | 0.028 |
| Time-varying covariates             |                |       |                |       |                |       |                |       |                |       |                |       |
| G2 current MJ use                   | 0.044          | 0.024 | <b>0.062*</b>  | 0.023 | 0.048          | 0.025 | 0.039          | 0.031 | <b>0.063*</b>  | 0.030 | 0.044          | 0.032 |
| G3 own norms                        | <b>1.603*</b>  | 0.331 | -              | -     | -              | -     | <b>2.256*</b>  | 0.424 | -              | -     | -              | -     |
| G3 Perceived parent norms           | -              | -     | <b>1.443*</b>  | 0.353 | -              | -     | -              | -     | <b>0.834*</b>  | 0.365 | -              | -     |
| G3 Perceived peer norms             | -              | -     | -              | -     | <b>1.346*</b>  | 0.223 | -              | -     | -              | -     | <b>1.274*</b>  | 0.268 |

MJ = marijuana; G1 = grandparent; G2 = parent; G3 = child.

\*  
 $p < .05$ .

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