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Parental Influences on Marijuana Use in Emerging Adulthood

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The purpose of this study was to gain a clearer understanding of the relation between parental relationship qualities and overall emerging adulthood (EA) marijuana use processes. The present study drew from an ethnically and socioeconomically diverse sample of EAs (ages 19–22) and their parents ($n = 470$) from the Pacific Northwest region. This study used parent-report and child-report data to capture measures of parenting and EA marijuana use outcomes. Latent Class Growth Analysis (LCGA) was used to model trajectories of marijuana use and risk factor analyses were used to examine how marijuana group membership varied by covariates and parental relationship qualities. Results revealed that lower levels of family cohesion and quality of parent–child communication were more likely to predict membership in the high-using groups and moderate-decreasing user groups in comparison to low-to-non users. Results also indicated that lower levels of frequency of parent–child communication were more likely to predict membership in the high-users group compared to the low-to-non users. Regarding parent knowledge of marijuana use, trends toward congruence and underestimation of EA marijuana use predicted membership in the high-using and moderate-decreasing groups compared to the low-to-non users. Study results indicate EAs in their early 20s may be more likely to engage in healthy decision-making regarding marijuana use in an environment that includes warm, supportive parent–child relationships where parents are aware of their EAs use without focusing on their EA's perceptions of risk.

Keywords: emerging adulthood, parent–child relationship, marijuana use, trajectory analysis

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Emerging adulthood (EA; 18–25 years of age; Arnett, 2007) is a developmental period marked by critical transitions (e.g., increased independence, identity exploration, vocational instability). During this time, substance use peaks (Johnston et al., 2009). Emotional maturation parallels neurocognitive development during this time (Kogan, 2017). For example, research suggests prefrontal regions associated with executive functioning continue maturing in EA until after age 25.

For many EAs, family relationships continue to serve as a primary source of support, instrumentally and emotionally. Healthy parent–child relationships during this period are protective for some EAs and reduce the associated risks and stressors (Napper et al., 2016; Padilla-Walker et al., 2008, 2011). Therefore, parents must balance supporting their children's independence, while also providing support for their children's capacities for decision-making, which are still developing (Kogan, 2017).

Several prospective studies have indicated the important role parents play in EAs and the prevention of substance use (Brody et al., 2012). The majority of research targeting EAs has focused on the prevention of binge drinking, has occurred in a college or university setting, and has focused on specific subgroups of the college population, including first-year students (for meta-analyses, see Carey et al., 2012; Samson & Tanner-Smith, 2015). Research findings have shown that poor quality of parent–child relationships and parental permissibility of alcohol use predict greater alcohol and drug use among EAs in college (Abar et al., 2014; Huh et al., 2013). Additionally, nurturing parent relationships contribute to abstinence from heavy alcohol use beyond the effect of adolescent relationships (Madkour et al., 2017). Little research has been conducted on how family relationships are associated with the development of marijuana use in EA, despite the fact heavy marijuana use is associated with a number of negative outcomes in EA, including: (a) memory problems, (b) poor academic performance, (c) negative physical outcomes, and (d) mental health issues (Bechtold et al., 2015; Buckner et al., 2012).

EAs have the highest rates of marijuana use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2013). Furthermore, marijuana use has increased by 35% since 2006, and use is anticipated to continue to increase due to legal status changes (Johnston et al., 2013). The results from several studies suggest parent-related factors are associated with EA marijuana use. For instance, research among college students suggests a link between parental monitoring before and after matriculation of postsecondary education and less frequent use of marijuana use (Napper et al., 2016).

Society and culture play an important role in influencing substance use (Stone et al., 2012). Recently, there has been a notable shift toward the legalization of marijuana in the United States. This has also affected the acceptability of use of medical and recreational

marijuana (Paschall et al., 2017). Currently, medical cannabis policies have passed in 36 states and Washington DC (Marijuana Policy Project, 2020). In addition, as of December 2020, recreational use of marijuana will be legal in at least 15 states and Washington, DC (Marijuana Policy Project, 2020). The legalization of medical marijuana could affect EA marijuana use by encouraging social norms that are positive to marijuana use or by strengthening beliefs that marijuana use is not detrimental (Paschall et al., 2017). On the other hand, some research indicates that increases in marijuana use since 2005 reflect general-period effects not related specifically with state marijuana legalization changes (Kerr et al., 2018). Evaluating how different factors of parenting and family are associated with the development of EA marijuana use is particularly relevant in the current shifting political climate surrounding marijuana use.

Longitudinal Patterns in Growth of Marijuana Use

The developmental trajectory pattern for marijuana use involves escalation during adolescence, peak use in young adulthood, and some subsequent decrease after young adulthood (Johnston et al., 2016). However, there are distinct trajectories of marijuana use empirically modeled and categorized (Nelson et al., 2015; Passarotti et al., 2015; Terry-McElrath et al., 2017). These marijuana use trajectories have been identified through advanced statistical techniques, including group-based trajectory modeling (GBTM; Nagin, 2005). GBTM is a type of latent class growth analysis that does not assume individuals follow a similar or uniform pattern of behavior across time. This method allows for the identification of sometimes hidden subgroups of individuals (i.e., latent classes) who may share characteristics on one or multiple observed variables. The identification of different trajectories of substance use may provide useful theoretical and intervention implications. Identifying trajectories allows researchers to understand how different sets of risk or protective factors may be relevant to marijuana use trajectory patterns (e.g., escalation, decline; Ellickson et al., 2004). Schulenberg et al. (2005) identified trajectories of marijuana use in young adulthood, including chronic, decreased, increased, fling, rare, and abstainers. These trajectories were confirmed in a later study conducted by Jackson et al. (2008), except for the fling group.

Few studies have examined the associations between parental relationship quality and trajectories of EA marijuana use over time. This study investigates how parental relationship qualities may be associated with marijuana use outcomes, as well as marijuana use trajectories, in EA. This research is important because it will increase our understanding of how different parent factors are related to the development of EA marijuana use. Additionally, this research will inform research and service delivery relevant to EAs and their families. Several parenting skills will be examined: (a) family cohesion, (b) parent knowledge of substance use, and (c) frequency of parent–child communication, and (d) quality of parent–child communication.

Family, Parent, and Parent–Child Factors and EA Risk Behaviors

Results from multiple studies have shown how parenting factors influence a host of adolescent risk and adjustment outcomes (Han & Waldfogel, 2007). Yet, few studies have been conducted on how family factors may be associated with the development marijuana use and perceptions of risk in EAs. First, a lack of family cohesion might serve as a risk factor in regard to EAs' engagement in problem behaviors. For instance, supportive family relationships have been shown to mitigate the risk of substance use behavior (Padilla-Walker et al., 2008). Furthermore, family cohesion, which includes closeness, warmth, togetherness, affection, and support, has been shown to contribute to lower levels of deviant behavior and substance use outcomes in adolescents (Sánchez-Queija et al., 2016). Sánchez-Queija et al. (2016) found family cohesion decreased substance use from adolescence to EA. On the other hand, family conflict, such as the expression of anger or escalations in discord, has been shown to be associated with disruptive effects regarding the well-being and emotional health of adolescents (Roubinov & Luecken, 2013). While much literature has documented the role of family cohesion on adolescent risk outcomes, less empirical attention has investigated the role family cohesion plays on EA marijuana use outcomes.

Along with family cohesion, parent knowledge of substance use also plays a role in the development of EA risk behaviors. Similar to parent monitoring and supervision, parent knowledge refers to what parents know about their children's behaviors and activities (Crouter & Head, 2002). General family functioning might play a role in the promotion of parents' knowledge of their adolescent's activities (Henry et al., 2006). However, as adolescents enter EA, the relationship between the desire for autonomy and parents' continued desire to have knowledge of their children's activities can be a source of tension. Nonetheless, researchers have found parent knowledge of behavior is uniquely associated with risk behaviors in EA, even after controlling for parental closeness (Padilla-Walker et al., 2008). There have been few studies examining the role of parent knowledge about marijuana use in EAs. Research findings suggest parents' level of knowledge about their children's behavior may be linked to overall functioning of the family context (Padilla-Walker et al., 2011). These same researchers found positive family cohesion is indirectly related to overall parent knowledge.

In addition to family cohesion and parent knowledge of substance use, the frequency and quality of parent–child communication are protective factors of adolescent substance use (Ackard et al., 2006). Parent–child communication refers to the parents' ability to communicate with their children, which leads to information gathering and reciprocity in the relationship (Keijsers & Poulin, 2013). Evidence supports the role of parent–child communication as a predictor of healthy child development and as a protective factor for adolescent substance use (Ennett et al., 2001). Greater frequency and positive quality of general parent–child communication, such as listening and understanding (Runcan et al., 2012), have been linked to lower levels of adolescent substance use (Ackard et al., 2006) and reduced risky behaviors among EAs (Madkour et al., 2017). While much research has examined the role of parent–child communication in adolescence substance use, far less research has focused on the roles of frequency and quality of parent–child communication as predictors of EA marijuana use.

Research findings have suggested parent knowledge is promoted through children's self-disclosure and parents' seeking out of information (Crouter et al., 2005). Additionally, family environments promoting healthy expressiveness, as well as self-regulation, also encourage parent–child communication (Padilla-Walker et al., 2011). Close, communicative parent–child relationships seem to be protective factors against heavy EA episodic drinking (Madkour et al., 2017). Taken together, this research suggests family cohesion and parent knowledge are linked with the promotion of the quality

and frequency of parent–child communication (Padilla-Walker et al., 2011). However, how parenting factors may influence EA marijuana use and perceptions of risk have not been investigated.

Study Objectives

The proposed study seeks to investigate how different qualities of parenting influence marijuana use in EA using the following; (a) family cohesion, (b) parent knowledge of substance use, (c) frequency of parent–child communication, and (d) quality of parent–child communication. This study will augment prior research by using longitudinal data with a diverse sample comprised of a majority of EAs who are not in college (Stone et al., 2012). The study examined (a) the trajectories of EA marijuana use and (b) associations between parental relationship quality in four domains and EA marijuana use membership.

Method

Sample and Procedure

The proposed study sample is comprised of EA individuals and their parents from an urban, Pacific-Northwest population participating in a larger longitudinal study (DA018374 and HD075150). The study received IRB (Institutional Review Board) approval (protocol number: 10192011.016), and the title of the study was "Parenting to Prevent Substance Use in Late Adolescence." This larger study centers on the quality of the parent–child relationship and risk behavior during the transition to adulthood and risk behavior after receiving a family-centered intervention. Participating youths were recruited in sixth grade from three middle schools and have been followed until age 23 ($n = 470$). Parents of all sixth-grade youths in two cohorts were approached for participation, and 80% consented to the study. Youths and their caregivers were then randomly assigned to control or intervention conditions.

The EA participants were ages 19–23 years ($M = 20.0$, $SD = 0.74$). Males and females represented 48.1% and 50.4% of the sample, respectively. Additionally, 1.5% of participants identified as other. The sample was culturally diverse: 32.2% European American/White, 17.0% biracial/mixed ethnicity, 16.0% African American/Black, 22.4% Hispanic/Latino, 7.1% Asian American, 3.2% Native American, and 2.1% Native Hawaiian or Other Pacific Islander. In this longitudinal study, for Wave 6 at age 20 the sample size was 415 ($n = 415$); for Wave 7 at age 21, the sample size was 388 ($n = 388$); for Wave 8, the sample size was 360 ($n = 360$). This longitudinal study has maintained a high degree of retention, with 74% of the original sample participating at age 20 ($N = 441$), 70% at age 21 ($N = 415$), and a 78% total retention for the EA years (some participants completed only the assessment at age 21). Primary caregivers filled out the questionnaires as the "caregiver," including primarily mothers (90.7%), but also a few fathers and other caregivers. Regarding family structure, approximately half (50.2%) of the participants' caregivers identified as being married. Of the remaining caregivers, 17% identified as single, and 15.5% identified as divorced. The sample continued to be an at-risk sample, with an average household income of $45,000 per year for a household of four. At age 20, 54% of young adults were living with their parents, 24% were attending a 4-year college, and 14% did not yet have a high school degree. Daily use of marijuana was

reported by 22% of EAs, and use increased at age 21 to 26%, well above the national average of 4.6% (Center for Behavioral Health Statistics & Quality, 2015); 48% reported multiple binge drinking episodes involving five or more drinks in a row.

After recruitment during the middle school years, participants were re-contacted at age 19 and invited to participate in three subsequent waves of data collection (ages 20, 21, and 22). EAs and their caregivers completed self-report questionnaires and were asked to bring the completed documents to the office or return them via mail. Caregivers were compensated $50 and EAs were compensated $100 for completing the questionnaires because the EA questionnaire was substantially longer. Participation was completely voluntary. For the waves under study, the data was collected between 2013 and 2018. In November 2014, adult use and possession of marijuana were legalized. (Marijuana Policy Project, 2018).

Measure

The data examined in this study include self-report measures. Multiple measures were used in this study, including demographics and question about daily family life. Measures for demographic variables include age, gender, and comorbid alcohol use. Measures for daily life include marijuana use, perceptions of risk, family cohesion, parent knowledge of substance use, frequency of parent–child communication, and quality of parent–child communication.

Factors and Covariates

Gender. Gender was dummy coded with $1 = male$ and $0 = female$.

Comorbid Alcohol Use. Alcohol consumption in the past 3 months was assessed through the following self-report questions adapted from the Teen Interview (CINT; Child & Family Center, 2001b): (a) "When you drank beer in the last 3 months, how much did you usually drink?" (b) "When you drank wine in the last 3 months, how much did you usually drink?" (c) "When you drank hard liquor in the last 3 months, how much did you usually drink?" Possible responses were $0 = less\ than\ one$, $1 = one\ drink$, $2 = 2\ drinks$, $3 = 3\ drinks$, $4 = 4–5\ drinks$, $5 = If\ six\ drinks\ or\ more$, how many? These three measures were combined to create a composite variable of comorbid alcohol use.

Housing Status. EA housing status at age 20 was dummy coded to indicate $0 = EA\ resided\ independent\ of\ their\ parent(s)$ and $1 = EA\ resided\ in\ the\ same\ home\ as\ their\ parent$.

College Status. EA educational attainment at age 20 was dummy coded so that $0 = participant\ has\ not\ attended\ college$ and $1 = participant\ is\ currently\ enrolled\ in\ college$.

Group Condition

Although parenting was one focus of the original intervention study, caregivers received this support and age-appropriate parenting education at a much earlier developmental phase in this longitudinal study (e.g., 6th grade vs. EA) and no significant differences between intervention and control groups persisted in parenting variables during EA waves of data collection; therefore, in all subsequent analyses intervention and control participants were

analyzed together and group condition was not included as a variable of focus.

Family Cohesion. A measure of family cohesion was completed by parents at ages 20, 21, and 22 (Child & Family Center, 2001a, 2001b; Wave 6, $\propto$ = .845 (parent), Wave 7, $\propto$ = .850 (parent), Wave 8, $\propto$ = .857 (parent). This construct was specifically assessed through the following self-report questions: Over the last 3 months, how often were the following statements true? (a) There was a feeling of closeness in our family. (b) We spent time together as a family. (c) Family members backed each other up. (d) Things our family did were fun and interesting. Possible responses were 0 = *never*, 1 = *sometimes*, 2 = *about half the time*, 3 = *often*, 4 = *always*. All measures were combined to create a composite variable of family cohesion.

Congruence in Parent Knowledge of Marijuana Use and EA Marijuana Use

A measure of parent knowledge of substance use was completed by parents at EA ages 20, 21, and 22 to capture more dimensions of parent knowledge (i.e., underestimation, overestimation). This construct, specifically assessed through self-report questions for each parent, came from the CFC Youth Questionnaire (Child & Family Center, 2001b; see Supplemental Methods and Table S1): How often has your son/daughter used marijuana in the last 3 months? Possible responses were 0 = *absolutely no idea*, 1 = *never*, 2 = *occasionally*, 3 = *somewhat regularly*. A measure of EA marijuana use was completed by EAs at ages 20, 21, and 22. This construct, specifically assessed through self-report questions for each child, came from the CFC Youth Questionnaire (Child & Family Center, 2001a): How often did you use marijuana in the last 3 months? Possible responses were 0 = *once or twice*, 1 = *once a month*, 2 = *once every 2–3 weeks*, 3 = *once a week*, 4 = *2–3 times a day a week*, and 5 = *once a day*, 6 = *2–3 times a day or more*, 6 = *never*. To create a variable called congruence, the following variables were collapsed: once a month and once every 2–3 weeks; once a week and 2–3 times a day a week; once a day and 2–3 times a day (or more). The variables from each question were matched and subtracted from each other. Greater congruence occurred as the outcome approached 0 (see supplemental methods). A positive value indicates the parent is underestimating their EAs marijuana use, while a negative value indicates the parent is overestimating their EAs marijuana use.

Frequency of Parent–Child Communication. A measure of parent–child communication was completed by parents at EA ages 20, 21, and 22 (Wave 6, $\propto$ = .611, Wave 7, $\propto$ = .605, Wave 8, $\propto$ = .629). This construct, specifically assessed through self-report questions for each parent, came from the CFC Youth Questionnaire (Child & Family Center, 2001b) through the following self-report questions: In the past 3 months, how often have you (a) Had in person contact with your son/daughter? (b) Talked on the phone with him/her? (c) Sent email or letters to him/he? (d) Received emails or letters from him/her? (e) text, Skyped, or communicated through social media? Possible responses were 0 = *never*, 1 = *less than once a month*, 2 = *once or twice a month*, 3 = *3–4 times a month, 2–3 times a week*, 4 = *more than 3 times a week*, 5 = *daily or almost daily*. all measures were combined to create a composite variable of frequency of parent–child communication.

Quality of Parent–Child Communication. A measure of quality of parent–child communication was completed by parents at EA ages 20, 21, and 22 (Wave 6, $\propto$ = 827, Wave 7, $\propto$ = .813, Wave 8, $\propto$ = .798). This construct, specifically assessed through self-report questions for each parent, came from the CFC Youth Questionnaire (Child & Family Center, 2001b) through the following self-report questions: In the past 3 months, how often did the following things happen between you and your son/daughter: (a) We enjoyed spending time together (over the phone, email, telephone, Skype, Social Media, or in person. (b) I got along with my son/daughter. (c) I trusted his/her judgment. (d) I talked with my son/daughter about his/her activities and plans. (e) We visited, did an activity, or took a trip together. (f) We had a good conversation about something. Possible responses were 0 = *Never*, 1 = *Sometimes*, 2 = *About half the time*, 3 = *Often*, and 4 = *Always*. All measures were combined to create a composite variable of quality of parent–child communication.

Marijuana Use. Measures of marijuana use in the past 3 months were completed by EAs at ages 20, 21, and 22 (Teen Interview, CINT; Child & Family Center, 2001). This measure was specifically assessed through the following self-report question on the CINT: "How often did you use marijuana in the last 3 months?" Possible responses were 0 = *never*, 1 = *once or twice*, 2 = *once a month*, 3 = *once every 2–3 weeks*, 4 = *once a week*, 5 = *2–3 times a week*, 6 = *4–6 times a week*, 7 = *once a day*, 8 = *2–3 times a day or more*. Marijuana frequency will represent the outcome variable for this study.

Analytic Plan

The overall aim of the proposed study was to examine how four parental relationship qualities (e.g., family cohesion, congruence in parent knowledge of marijuana use, frequency of parent–child communication, and quality of parent–child communication) predicted membership in distinct longitudinal EA marijuana use patterns. Preliminary data analysis was conducted using SPSS version 25.0 for Mac (IBM Corp, 2017). Variables were screened for violation of statistical assumptions in both the raw and imputed data (e.g., normality, skewness, kurtosis). Little's Missing Completely at Random (MCAR) test was utilized to assess whether data were missing completely at random or if systematic patterns existed. This study used the regression methods of missing data imputation to handle missing data. Using complete cases, multiple regression is used to predict missing values (Enders, 2010).

For main study analyses, data were analyzed using a Latent Class Growth Analysis (LCGA) using the Statistical Analysis Software (SAS)-based, PROC TRAJ (Jones et al., 2001), to create marijuana use profiles from ages 20 to 22 using data in the sample. Trajectory models were specified using a zero-inflated Poisson model (ZIP model), which allows for the modeling of non-negative count measures of marijuana use. We considered models containing one- to six- groups based on prior empirical studies on marijuana use trajectories (Nelson et al., 2015). Models were evaluated using the Bayesian information criterion and model adequacy diagnostics to verify the best fitting model (Nagin, 2005). As described in greater detail below, the final selected model contained four groups (low to non-users, moderate-decreasers, low-increasers, and high users).

"Risk factor analysis" within the Proc Traj macro was used to examine how group membership varied by gender, alcohol use, housing status, and EA college attendance. When investigating predictors of group membership, group-based modeling provides the log odds of the effect of each predictor on the probability of membership in each trajectory group in comparison to a baseline or comparison group (see Nagin, 2005). For the purposes of this study, group 1 (i.e., the "low to no use" group) was specified as the comparison group, to specifically compare how higher marijuana use patterns were distinguished from lower risk users (e.g., low to no users). Next, four risk factor analyses were used to examine how marijuana group membership varied by four parenting predictors: family cohesion, congruence in parent knowledge of marijuana use, frequency of parent–child communication, and quality of parent–child communication. We aimed to compare how lower risk users might be distinguished from participants with more at-risk marijuana use patterns based on parenting factors, which were experienced contemporary with the first wave of data when participants began the transition to EA. Therefore, we again specified group 1 as the comparison group. To characterize the unique association of each parenting variable, models were run in this analysis with only one predictor at a time.

Results

Preliminary Analyses

Descriptive Statistics

Missing data analyses were conducted using Little's missing completely at random (MCAR) test. Little's MCAR test was significant, $X^2(129) = 258.94$, $p < .001$, indicating missing items were not missing completely at random. Non-response items were assessed for both raw and imputed data. See Table 1 for descriptive statistics on key study variables.

Marijuana Use Trajectories

The best-fitting trajectory model included four trajectories of marijuana use. Table S2 shows the BIC and model comparison statistics for determining the optimal number of groups. Table S3 provides a summary of the group-based trajectory analysis conducted on EA marijuana use. Model diagnostics suggested a well-fitting model (see Table S4), relative to a three trajectory or five trajectory model. Visual examination of the trajectories indicated that each of the four trajectories was indicative of a different marijuana use pattern. These four trajectories, plotted in Figure 1,

include low to non-users (35.3%), moderate-decreasers (15.5%), low-increasers (14.3%), and high users (34.9%).

Characteristics of Marijuana Use Trajectory Groups by Covariates

Membership in marijuana groups varied by gender. Being male predicted membership in the moderate-decreasing ($b = 1.03$, $p < .05$) and high-using ($b = 1.09$, $p < .001$) marijuana use trajectories in comparison to non-users. Thus, being male relative to female increased risk for being in two of the higher risk marijuana groups relative to the low to no-use group. Comorbid alcohol use did not predict membership in the marijuana use trajectories, which may be likely given alcohol use was overall high. Additionally, EA college attendance and EA housing status did not predict membership in any of the marijuana use trajectories.

Characteristics of Marijuana Use Trajectory Groups by Parenting Qualities

Membership in marijuana groups varied by levels of parental relationship qualities (see Table 2) at Wave 6. To identify the unique risk of each parental relationship quality, parenting predictors were examined independently in four different models. First, in model 1, lower levels of family cohesion predicted membership in the moderate-decreasing and high-using marijuana use trajectories in comparison to the low to non-users. Next, in model 2, lower levels of frequency of parent–child communication predicted membership in the high using trajectory in comparison to the low to non-users. In model 3, higher levels of scores on congruence in parent knowledge of marijuana use predicted membership in the moderate-decreasing and high-using marijuana use trajectories in comparison to the low to non-users. Also, in model 3, lower levels of scores on congruence in parent knowledge of marijuana use predicted membership in the low-increasing trajectory group in comparison to the low to non-users. Finally, in model 4, lower levels of quality of parent–child communication predicted membership in the moderate-decreasing and high-using marijuana use trajectories in comparison to the low to non-users.

Discussion

The present study aimed to expand upon the parenting and marijuana use EA literature by examining how parental relationship qualities predicted membership in various marijuana use trajectories. Previous studies examining trajectories of cannabis use in

Table 1
Means and Standard Deviations of Key Study Variables

Variable	Wave 6			Wave 7			Wave 8		
	n	M	SD	n	M	SD	n	M	SD
Age	415	20	8.83	388	21.5	8.35	360	22.9	8.37
Comorbid alcohol use	358	4.46	4.15	357	5.50	4.15	335	5.91	4.17
Family cohesion	319	10.64	3.77	269	10.53	3.84	221	10.51	3.92
Parental knowledge	319	0.36	1.17	218	0.51	1.16	271	0.49	1.37
Frequency of parent–child communication	316	15.77	5.65	271	15.00	5.93	220	14.48	5.69
Quality of parent–child communication	319	16.12	4.66	269	16.41	4.49	222	16.34	4.40
Marijuana use	310	1.64	1.61	303	1.71	1.67	292	1.79	1.71

Note. Parent knowledge is referred to as congruence in parent knowledge of marijuana use and emerging adult marijuana use in the text.

Figure 1

Visual Depiction of the Four Marijuana Use Trajectories Over Waves 6, 7, and 8
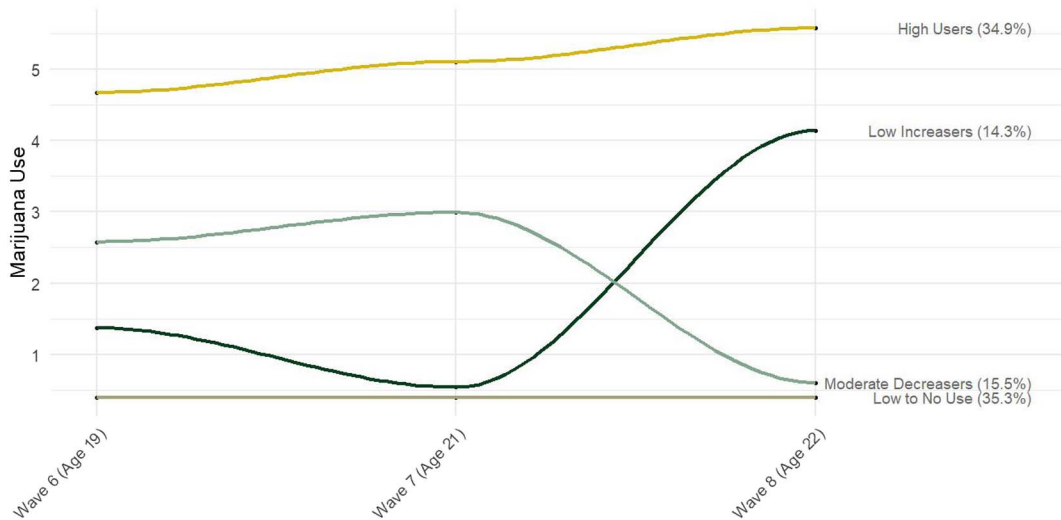
Note. See the online article for the color version of this figure.

young adulthood using latent class analysis have found mostly similar group trajectories (e.g., Jackson et al., 2008; Schulenberg et al., 2005), including high use, decreasing, increasing, and low/abstaining groups. Overall, results suggest parent relationships remain protective for problematic EA marijuana use patterns, even after accounting for covariates. Four trajectories of marijuana use patterns were identified across the three waves: (a) high users, (b) low increasers, (c) moderate decreasers, and (d) low to no users. Lower levels of family cohesion, quality of parent–child communication, and frequency of parent–child communication predicted membership in higher risk groups. The identification of longitudinal patterns over time provides useful theoretical and intervention implications. For example, one implication of understanding the progression of EA marijuana use patterns includes the identification of protective and risk factors that differentiate between various types of marijuana use trajectories (Ellickson et al., 2004). Results indicate the 20s may be an important developmental period for marijuana use prevention and intervention to slow the increase in use probabilities from ages 19 to 20, and to support use intervention in the early 20s (Terry-McElrath et al., 2017).

Results further showed parental relationship qualities differentiate classes of marijuana use. and examine how covariates (e.g., gender, comorbid alcohol use, housing status, college attendance) and parental relationship qualities predicted membership in EA marijuana use patterns over time by comparing low to no users to higher marijuana use patterns. Being male relative to female increased overall risk for being in two of the higher risk marijuana groups relative to the low to no-use group. This finding aligns with prior research suggesting membership in heavy or increasing marijuana use trajectories during young adulthood was more likely for males (e.g., Ellickson et al., 2004).

Lower levels of family cohesion and quality of parent–child communication were more likely to predict membership in the high-using groups in comparison to low-to-non-users. The findings are in line with past studies indicating family cohesion (Padilla-Walker et al., 2008; Sánchez-Queija et al., 2016) and quality of parent–child communication (Runcan et al., 2012) may continue to play roles in mitigating risk behaviors in EA. Interestingly, for some participants, lower levels of family cohesion and quality of parent–child communication predicted probability in moderate-decreasing user groups in comparison to low to non-users. One interpretation of this finding is that family cohesion and quality of parent–child communication are not as influential for EA marijuana use outcomes as EAs become older and more autonomous (Nelson & Barry, 2005).

Results also indicated that lower levels of frequency of parent–child communication were more likely to predict membership in the

Table 2

Predictors of Trajectory Membership for Parenting Predictors at Wave 6

Group	Model 1 family cohesion β (*SE*)	Model 2 frequency β (*SE*)	Model 3 congruence β (*SE*)	Model 4 quality β (*SE*)
Group 1	[reference]	—	—	—
Group 2	−0.091(0.040)*	−0.035(0.031)	1.993(0.462)*	−0.080(0.040)*
Group 3	0.043(0.044)*	0.031(0.029)	−0.499(0.210)*	0.052(0.038)
Group 4	−0.061(0.029)*	0.020(0.020)*	2.004(0.421)*	−0.079(0.027)*

Note. Parenting predictors were run in separate models.
* *p* < .05.

high-users group compared to the low-to-non-users. In line with literature regarding the protective role of frequency of parent–child communication in EA alcohol use outcomes (Madkour et al., 2017), findings suggest levels of frequency of communication may also play a role in EA marijuana use outcomes as well.

Regarding parent knowledge of substance use, it appears parent knowledge is associated to EA marijuana use outcomes. Specifically, findings indicate trends toward congruence and underestimation of marijuana use predicted membership in the high-using and moderate-decreasing groups compared to the low-to-non-users. In addition, trends toward overestimation and congruence in marijuana use predicted membership in the low-increasing users compared to the low to non-users. One interpretation of the parental knowledge finding is that once children begin the transition to adulthood, they may understand their parents' request for knowledge differently than when they were younger (Buckner et al., 2010; Padilla-Walker et al., 2008; Wood et al., 2004). Given substance use peaks during EA (Johnston et al., 2016), parents may be particularly attentive to their children's activities, engage in more parental monitoring, and subsequently have more knowledge about their children's behavior (Padilla-Walker et al., 2008). In the literature, there is debate about parental monitoring as a construct and how this construct should be measured. Several studies indicate parents who are not well informed of their children's daily activities and peer interactions, and not monitoring, are more likely to have children who engage in risk behaviors (Crouter et al., 2005). Further, some studies suggest this association between parent control and EA adjustment outcomes continues in EA. For instance, EAs who experience psychological control from parents cultivate lower emotional regulation skills (Manzeske & Stright, 2009). As adolescents enter EA, the interaction between children's desire for agency and autonomy and parents' continued pursuit of knowledge about their children's activities may contribute to parent–child conflict or tension (Aquilino, 2006). Thus, if a parent is more accurate about their child's marijuana use, they may be characterized as more controlling, contributing to higher levels of use (Padilla-Walker et al., 2008). Given EAs are attempting to develop autonomy from their parents (Nelson & Barry, 2005), parental knowledge during this time period may be perceived as dominating or regulatory (Padilla-Walker et al., 2008). This finding may also be related to prior research demonstrating that parental attitudes toward substance use are predictive of use (Wood et al., 2004) ; however, this represents a different field of study outside the scope of our present study.

Alternatively, the parental knowledge finding also indicated that parent's underestimation of EA marijuana use is also linked to higher levels of EA marijuana use. Thus, parents' lack of congruent knowledge about their EA's marijuana use may be associated with a higher likelihood of engagement in more problematic patterns of marijuana use. It is possible as parents know less about their children's behavior, the more likely children will engage in problematic marijuana use patterns. This finding is in line with previous literature suggesting parent knowledge of behavior contributes unique variance to risk behaviors in EA even when considering the influence of parental closeness (Padilla-Walker et al., 2008).

Taken together, this finding points to the complexity of the role of parents during EA. While having congruent knowledge about what your children are doing may not be protective for problematic EA marijuana use, a lack of knowledge of your child's EA use may also be a risk factor. It may be that parent knowledge of EA marijuana

use is differentially associated with EA marijuana use outcomes depending on the emotional context of the parent–child relationship and how EAs characterize their parents' knowledge (Padilla-Walker et al., 2008). Given the scope of this study, future research should consider family context as a potential moderator of how congruence in parent knowledge of EA marijuana use may be associated with EA marijuana use outcomes.

Implications

This study has several implications for young people's development during EA, highlighting the importance of the parent–child relationship in EA. First, research indicates that EA is a critical period during which substance use peaks (Johnston et al., 2009). Marijuana is linked with various negative risk outcomes when used problematically (Buckner et al., 2010). Thus, identifying parenting qualities as possible protective or risk factors against these outcomes during EA is an important contribution to understanding how parents, clinicians, and educators might cultivate positive development during this time period (Arnett, 2007). Next, the longitudinal component of this study indicates the parenting behaviors examined in this study are linked to probability of membership in distinct marijuana use trajectories. EAs in their early 20's may be more likely to engage in healthy decision-making regarding marijuana use in an environment that includes warm, supportive parent–child relationships where parents are aware of their EAs use without focusing on their EA's perceptions of risk of use (Kogan, 2017). Findings suggest parents may serve as protective factors for EAs and are an important source of support for fostering healthy decisions regarding marijuana use.

One important contribution of this research to the literature is an expansion of knowledge about how various parental relationship qualities may predict membership in different trajectories of EA marijuana use, highlighting the continued role parents play in EA regarding EA marijuana use outcomes (Brody et al., 2012). These findings are theoretically and empirically aligned with previous EA literature. Supportive parent–child relationships bolster young adult's development of self-regulation skills (Kogan, 2017). Frequent and quality communication, family cohesion, and a feeling of closeness to parents seem to be important factors for EA children when they are met with making marijuana use decisions. EAs in their early 20's may be more likely to engage in healthy decision-making regarding problematic marijuana use in the context of warm, communicative, and supportive parent–child relationships. The findings suggest the public health importance of parenting practices for tackling problematic EA marijuana use in a sample of non-college attending youth. We envision the need to entertain new policies related to promoting awareness of the importance of parents in supporting EAs with healthy decision-making, especially non-college attending youth. According to Kogan (2017), outreach to families with non-college attending youth can present as a challenge, and there is a need for research on how to reach vulnerable EAs to provide supportive intervention, such as through social and interactive media platforms (Welch et al., 2016).

Limitations and Future Directions

It is important to consider existing limitations within this study. First, this study did not have a measure capturing parent–child communication specifically about marijuana, which is suggested

in the EA literature to be an important factor (Napper et al., 2016). If there were access to such a measure, estimated associations may have been stronger. Another limitation of this study involves the extent of missing data, as well as the violation of Little's MCAR. Regression imputation methods were used to handle missing data which may cause bias from measurement error (Rässler et al., 2008).

Future studies should explore how changes in parenting over time influence the change of the developmental trajectories of marijuana use by incorporating parenting as a time-varying predictor to offer precision in how parenting directly influences marijuana use across time within the trajectory groups. Also, this study examined parental relationship qualities independently. Future research might consider how the interactions of parental relationship qualities may predict membership in various marijuana use patterns as well. For instance, it may be that parent knowledge of EA marijuana use may be differentially associated to EA's marijuana use outcomes depending on the emotional climate of the parent–child relationship and how EAs characterize their parents' knowledge (Padilla-Walker et al., 2008). Given that the parental relationship qualities in this study are predictive of longitudinal marijuana use patterns, it is important to clarify what other variables may moderate these relationships. Additionally, although the legalization of marijuana use may account for the elevated prevalence of marijuana use in our sample, we cannot discount other potential contributing factors including individual (i.e., non-college attending participants), cultural (i.e., the socioeconomic status of participants), and regional (i.e., Pacific Northwest) sample characteristics. These factors may be explored in future studies to better understand the generalizability of study findings to other populations. Finally, regarding congruence of parent knowledge, it is possible that only congruence or underestimates would predict high and moderate use at Wave 6, as it may be difficult for parents to overestimate these higher levels of use. Future research should investigate how parents' ability to estimate their child's EA marijuana use influences research results. Additionally, future studies should consider how parents' ability to estimate their child's EA marijuana use influences our ability to model the relationship between parents and children regarding EA marijuana use.

Conclusion

The present study examined the effects of parenting during EA and EA marijuana use outcomes. This study included the use of a longitudinal design, allowing for repeated assessments of participants across three waves of EA. Additionally, this study is one of few studies to use a racially and socioeconomically diverse sample of EAs, including non-college-attending EAs. Results indicated family cohesion, parent knowledge of marijuana use, frequency of parent–child communication, and quality of parent–child communication influence probability of membership of distinct marijuana use trajectories. This research emphasizes the significance of studying parenting during EA as parenting continues to play an influential role in EA substance use outcomes.

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