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Predictors of Caregivers' Cannabis-Specific Rules in a Predominantly Cannabis-Naïve Sample of Youth in the Adolescent Brain and Cognitive Development (ABCD) Study

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ABSTRACT

Objective: Zero-tolerance cannabis rules are commonly used to prevent adolescent use. However, research investigating the circumstances under which parents/caregivers make or enforce rules is sparse. This study examined predictors of whether caregivers established (i.e., have explicit rules) and enforced (i.e., applied) cannabis rules across early to mid-adolescence. **Method:** Baseline (N= 9,807; age = 9.90 years) and year (Y) 1-3 follow-up data were used from the Adolescent Brain Cognitive Development (ABCD) Study. Youth were predominantly cannabis naïve (n = 19 trying cannabis by Y3, >99% did not try cannabis). Caregivers self-reported all measures except parental monitoring, which youth reported. Generalized estimating equations (GEE) modeled the probability of establishing explicit cannabis rules and then enforcing rules for everyone in the home (rather than youth only) from baseline to Y3. **Results:** At baseline, most caregivers had 1) established rules (75%) and 2) enforced rules (83%) for everyone in the home. Multivariate models showed that compared to in low THC/CBD states, caregivers in states with legal access for general adult or medical use had lower odds of establishing (ORs = 0.68 & 0.62) and enforcing (ORs = 0.65 & 0.62) rules. Compared to caregivers perceiving hard youth access to cannabis, those perceiving easy access, had lower odds of establishing (OR = 0.58) and enforcing (OR = 0.83) rules. Parental monitoring was not associated with establishing or enforcing rules. **Conclusions:** When cannabis access is limited legally or environmentally, parents appear more likely to establish and enforce cannabis-specific rules, further reducing risk of youth initiation. Identifying predictors of cannabis rules can inform family-based cannabis prevention efforts.

Key words: cannabis or marijuana, family or house rules, adolescent or youth, legalization, access, monitoring, parenting, prevention

Cannabis is one of the most commonly used substances among adolescents in the United States, with nearly 1 in 3 adolescents having tried cannabis by the end of high school (Miech et al., 2024). Early and frequent cannabis use is associated with short-term negative outcomes

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during adolescence, such as academic difficulties (Castellanos-Ryan et al., 2017) and greater psychopathology symptoms (Chabrol et al., 2012), as well as long-term consequences later in life, like impaired neuropsychological development (Lees et al., 2021) and increased risk for developing a cannabis use disorder (CUD; Leung et al., 2020). Understanding risk and protective factors to prevent and delay cannabis initiation during adolescence and reduce immediate long-term negative outcomes remains an important public health goal.

Adolescence is a sensitive period in which youth begin to negotiate independence with parents and form their own attitudes about cannabis (Abar et al., 2025; Donovan, 2018). Consequently, parents and caregivers play an early and prominent role in protecting youth from cannabis initiation and escalation (Miller et al., 2017). Social learning theory suggests parents shape adolescent attitudes, and eventually cannabis use behavior, through a range of parenting behaviors (Akers & Cochran, 1985; Bandura, 1971). Cannabis-specific rules in the home are one of the most studied cannabis-specific parenting strategies (i.e., explicit strategies used to prevent or reduce youth cannabis use) that caregivers employ. Rules can be defined as whether rules have been established (i.e., has a rule been created and communicated about cannabis to youth?) or whether a rule is enforced, which in the current study refers to whether rules are enforced for youth only or for everyone (i.e., including adults) in the home. Rules are most effective when they are established proactively, or before adolescent cannabis use occurs, and are zero-tolerance (i.e., no cannabis use is allowed) because they communicate family norms that cannabis is not permitted and create the expectation of punishment from use (Bailey et al., 2018; Eslava et al., 2023; Kokotovič et al., 2022). Although not explicitly examined in a previous study to our knowledge, enforcing cannabis rules for everyone in the home, as opposed to youth only, should reduce the risk of youth cannabis use by reducing cannabis access and modeling cannabis use behavior in the home (see Sartor et al., 2025 for a study on alcohol rules). Establishing and enforcing cannabis rules is also often encouraged in adolescent and family substance use-focused interventions, and one clinical trial found evidence that increasing parents' communication about established rules is associated with less frequent adolescent cannabis use (Fang et al., 2010; Fang & Shinke, 2013). In summary, establishing and enforcing rules can be an effective means for preventing adolescent cannabis use and are viable parenting and family-based intervention targets.

To date, most cannabis-specific parenting studies have investigated what parents do (i.e., types of parenting behaviors) to better understand etiological protective factors and intervention targets to prevent or reduce adolescent cannabis use. However, under what circumstances parents and caregivers might be more or less likely to establish and enforce cannabis rules is unclear. Examining predictors of why cannabis rules are established and enforced can increase insight into how parents and caregivers respond to cannabis-specific risk factors for youth. It can also help prevention programs and intervention providers identify at-risk youth and families for early cannabis initiation as well as identify and target risk and protective factors for modification.

A range of factors, such as the societal contexts in which parenting occurs, parents' knowledge, and other parenting strategies may influence whether parents make or enforce rules about youth cannabis use (Belsky, 1984; Hamilton et al., 2020). Cannabis policy, specifically state legalization status, has received the most attention as a predictor of cannabis-specific parenting strategies. In response to state medical and general adult (also referred to as recreational) cannabis legalization (i.e., more permissive laws around cannabis use), parents report increased cannabis-related discussions, emphasizing cannabis rules, and strong opposition towards teen use and adult use around teens (Eisenberg et al., 2019; Jones et al., 2020; Mason et al., 2015). Despite this general trend towards parents reporting increases in cannabis-specific parenting, the effect of cannabis legalization on parents' behavior is complex. Legalization is also associated with increased parental cannabis use and more permissive or positive attitudes towards cannabis generally (Wilson & Rhee, 2022), particularly medical use by youth and adults (Wisk et al., 2019). Increased parental use and permissive attitudes are established risk factors for offspring use (O'Loughlin et al., 2019) and may indicate more lenient cannabis-specific parenting strategies. Adolescents may perceive greater use

of cannabis among their parent's post state legalization (English & Whitehill, 2023), which could influence their perception of rules about cannabis in the home. Taken together, although parents generally report emphasizing cannabis rules and other socialization strategies in response to cannabis legalization, legalization influences may be more complex and depend on other factors (e.g., parent cannabis use, youth report of rules). The current study will test whether state-level cannabis legislation, operationalized as general adult access, medical access, or low delta-9-tetrahydrocannabinol /cannabidiol access (i.e., THC/CBD; Ross et al., 2021), is associated with the likelihood of establishing and enforcing cannabis rules.

In addition to considering the broad legal context, it is also important to consider proximal influences. Easy access to cannabis is one immediate contextual risk factor for adolescent cannabis use (Haas et al., 2018). Youth have more opportunities to acquire or become exposed to cannabis (e.g., access through peers who use), and parents may be more likely to establish rules to prevent use when they perceive cannabis to be easily accessible. Relatedly, parental monitoring (i.e., caregiver attempts to gain information about adolescents' whereabouts and activities) is a robust protective factor against adolescent cannabis use (Bohnert et al., 2012). However, its association with cannabis-rule setting is unclear. Monitoring may precede the understanding that a rule needs to be established and may facilitate ongoing enforcement of rules (Pelham et al., 2023). Awareness of adolescents' whereabouts and peer associations may provide insight into situations in which adolescents are exposed to cannabis and spark discussions about rules.

Current Study

Hypotheses in the current study were tested using data from the Adolescent Brain and Cognitive Development Study, which is a large longitudinal study of child brain development and health and includes data from children and their parents or caregivers (ABCD Study®, see the Methods section for a description of the ABCD study). This dataset was particularly well-suited to explore predictors of whether caregivers establish cannabis-specific rules (i.e., zero-tolerance rules versus no rules) and for whom the rules are enforced (i.e., youth-only versus everyone in the home) due to extensive parent and youth reported psychosocial variables. Moreover, the sample at the included waves of assessment was young and predominantly cannabis-naïve, which allows for examination of predictors of setting and enforcing cannabis-specific rules prior to cannabis initiation, ensuring that rule-setting and enforcement is governed by other factors and not in response to youth cannabis use. This is particularly relevant for understanding parenting behaviors that can prevent early cannabis initiation, which has immediate and long-term public health significance. It was hypothesized that the odds of establishing and enforcing rules for everyone in the home will be higher when 1) cannabis state laws are more lenient (general adult access compared to medical access only, medical access compared to low THC/CBD access), 2) it is perceived that cannabis is easy to access for youth compared to hard or not knowing, and 3) parental monitoring is high.

METHODS

Procedures

The ABCD Study® is a longitudinal study of child brain development and health and includes data from children and their parents or caregivers. It recruited a large, socioeconomically, racially, and ethnically diverse sample across 21 study sites (Compton et al., 2019) and utilizes annual repeated measures. Children ages 9 to 10 were recruited from 21 sites (representing 17 different states) across the United States between 2016-2018. An epidemiologically informed recruitment strategy was used to reflect the geographic, demographic, and socioeconomic makeup of the United States through school and community-based recruitment (Compton et al., 2019). Exclusion criteria at baseline included: youth not fluent in English, magnetic resonance imaging (MRI) contraindications, major neurologic disorder, gestational age < 28 weeks at birth or birth weight <1,200g (~ 2.65 lbs), birth complications resulting in hospitalization for > 1-month, previous diagnosis of schizophrenia, moderate or severe autism spectrum disorder, intellectual disability, or alcohol or substance use disorder. All youth and their caregivers were asked to complete annual in-person assessments

from which data is used in the current analysis. Youth also completed brief remote 6-month assessments between their annual visits and biannual neuroimaging, neither of which are used in the current study. Data from data release 5.1 were used in the current analysis and included baseline to three-year annual follow-up (four timepoints total). All procedures were approved by the Institutional Review Board at each of the 21 study sites. Parents/caregivers provided written informed consent, and all children provided assent.

Measures

Demographics (baseline). Caregivers reported on their own race and ethnicity, education level, combined household income, and their child's sex assigned at birth.

Cannabis-specific rules (baseline-Y3). Two caregiver-reported cannabis-specific rule items were included in analyses that measured establishing and enforcing rules, respectively. First, establishing rules measured whether parents or caregivers have created cannabis-specific rules in the home or not. It was assessed via a single item, "What are the family rules about using marijuana for your son/daughter?" with response options including 1 = not allowed to use marijuana under any circumstances, 2 = not allowed to use marijuana in home / no family rules outside home, 3 = allowed to use marijuana in home with permission, 4 = allowed to use marijuana in home whenever he/she wants, 5 = I don't set rules about marijuana use, 6 = I haven't made rules yet about my child's marijuana use. Due to low endorsement in some categories, this item was dichotomized such that 0 = no rules established (combined response option 5 and 6 from original item and 1 = no cannabis use allowed (response option 1 from original item). The other response options were dropped from analysis due to small cell sizes and ambiguous conceptual interpretation (see Supplemental Table S1 for original and new variable frequencies).

Second, enforcing rules captured whether cannabis rules were enforced for youth only or for everyone in the home. It was assessed using a single item, "Are these the same rules for all family members?", which was only answered by caregivers who endorsed establishing rules. Response options included 1 = no, applies only to children, not teen or adults, 2 = no, applies only to children and teen, not adults, 3 = yes. Due to low endorsement in some categories and for conceptual clarity, this item was also dichotomized such that 0 = rules apply to youth only (and not adults; combined 1 and 2 response options from the original variable) and 1 = rules apply for all family members.

Cannabis legal status (baseline). Participants were assigned to one of four categories based on their state of residence at baseline using categories established by Ross and colleagues (2021): general adult (recreational) access (i.e., 21 years or older; 2 states and sites), medical access only (7 states and 10 sites), low THC/CBD (7 states and 8 sites), and no general adult/medical access (1 state and site). Assignments to categories were based on the year when cannabis became available to consumers (i.e., accepting medical cannabis applications or the first recreational cannabis dispensary opened). Only one state represented within ABCD, Pennsylvania, had no legal access to general adult or medical cannabis at baseline (N = 253 families). This group was combined with the low THC/CBD access states due to small group sizes and because of a prior analysis finding no differences in results when combining the two categories (Ross et al., 2021). Of note, baseline data collection occurred prior to the passing of the Agricultural Improvement Act (U.S. Farm Bill) of 2018, which made cannabis and derivatives of cannabis with extremely low concentrations of the psychoactive compound delta-9-THC (no more than 0.3 percent THC on a dry weight basis) legal at the federal level.

Perceived cannabis access (Baseline-Y3). Caregivers reported their perception of how easily youth could access cannabis. Response options included 0 = very hard, 1 = sort of hard, 2 = sort of easy, 3 = very easy, 4 = don't know. Due to small group sizes and to aid conceptual interpretation, response options 1 through 3 were combined such that the variable used in analyses was 0 = very hard, 1 = sort of hard, sort of easy, or very easy (i.e., some perceived access), and 2 = don't know (see Supplemental Table S1).

Parental monitoring (baseline-Y3). Monitoring was assessed by youth report using 5 items in the ABCD Study (Karoly et al., 2016). Example items included, "How often do your

parents/guardians know where you are?" and "How often do your parents know who you are with when you are not at school and away from home?" Youth reported on a five-point Likert scale with response options ranging from 1 = never to 5 = always or almost always. Internal reliability was poor across all time points: baseline Cronbach's α = .48, Y1 α = .48, Y2 α = .53, and Y3 α = .60.

Data Analysis Plan

A substantial number of siblings were recruited in ABCD by design. Cannabis rule establishment and enforcement outcomes were perfectly correlated for siblings because the same caregiver reported on rules for both siblings. To address this interdependence, we retained only one sibling at random for data analysis. The final analysis sample at baseline consisted of N= 9,807 (N = 1,879 siblings dropped) youth and one parent/caregiver from the 21 study sites. Retention was strong, with N= 9,222 participants at Y1 follow up (94%), N= 8,987 at Y2 follow up (92%), and N= 8,319 at Y3 follow up (85%).

The two primary outcome measures, 1) establishing cannabis rules and 2) for whom rules were enforced (only for those that had established rules), were both binary and analyzed using separate models. We used generalized estimating equations (GEE) with a logit link to model the probability of establishing zero-tolerance cannabis rules and enforcing rules for everyone in the home. Instead of focusing on establishing and enforcing cannabis rules at a single timepoint, we estimated the average probability of establishing and enforcing rules across four annual timepoints (baseline to Y3 follow up). Thus, GEE answers the question: "On average, across the population how does the probability of establishing and enforcing cannabis rules differ across groups over time?" Statistical analyses were completed using the PROC GENMOD procedure in SAS software version 9.4 (SAS Institute Inc., 2023). To account for correlation of repeated measures within individual, we used an autoregressive correlation structure. We also considered clustering individuals within study site, but this level of clustering was not retained due to high overlap with state cannabis legal status. Demographic variables and state cannabis legalization status were assessed at baseline while all other variables were assessed from baseline to Y3 follow up. All possible comparisons were made for state legal status, perceived access, and caregiver race and ethnicity to avoid selecting an arbitrary reference category. Odds ratios (OR) and 95% confidence intervals (CI) were estimated for interpretation, and guidelines for small (1.68-3.36 or 0.29-0.59), medium (3.47-6.70 or 0.15-0.29), and large (>6.71 or <0.15) effects were followed (Chen et al., 2010). Sensitivity analyses were estimated for families where the participating caregiver did not change across follow up assessments (n = 6,971, 71% of the complete sample) to investigate whether changes in the participating caregiver impacted results.

Missing data across model variables varied from 0-9.54% at baseline, 6.46-6.89% at Y1, 9.40-10.49% at Y2, and 17.87-19.70% at Y3. A total of 25% of cases at baseline, 21% at Y1, 16% at Y2, and 11% at Y3 were dropped due to the nested structure of the enforcing rules outcome (only those who endorsed establishing rules reported on enforcement). Caregivers who enforced cannabis rules for youth only, had a lower education level, had a lower household income, or identified as a racial or ethnic minority compared to White caregivers were more likely to have complete missing data at one or more of the follow up time points. Multiple imputation by chained equations (MICE) was implemented using the mice package in R (version 4.5.1) to minimize the impact of missingness on results (Azur et al., 2011). A total of 20 imputations were generated and analyzed separately. PROC MIANALYZE in SAS software version 9.4 (SAS Institute Inc., 2023) was used to pool results and produce the final estimates. Only true missingness (not due to those who endorsed not yet establishing rules) on the enforcing rules outcome was imputed. Pre- and post-imputation descriptive statistics are reported in Supplemental Table S2, and SAS code for the GEE models are reported in Supplemental Materials 1. The ABCD data repository grows and changes over time. The ABCD data used in this report came from data release 5.1 (DOI: 10.15154/z563-zd24).

RESULTS

Descriptive Statistics

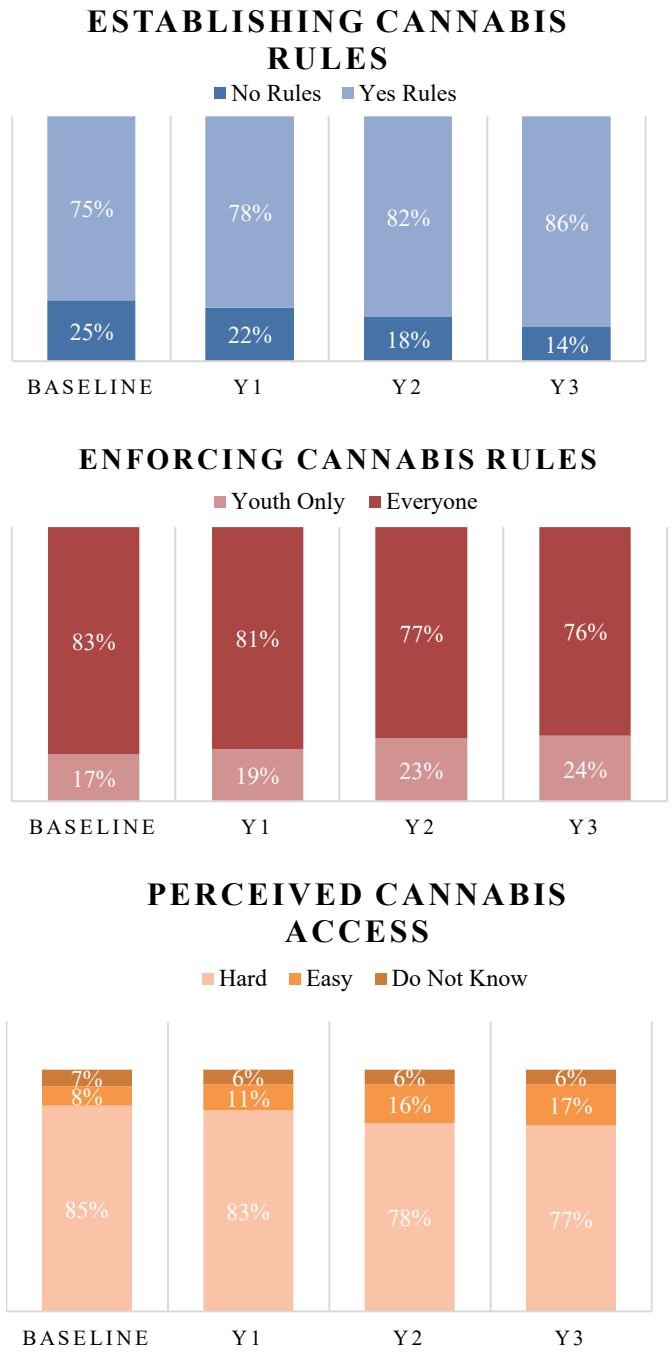
The sample of adolescents was predominantly cannabis naïve (n = 2 tried cannabis at baseline, n = 19 by Y3 follow up). At baseline, caregivers were majority biological mother (85%), followed by biological father (10%), adoptive parent (2.5%), other (1.5%), and custodial parent (1%). The participating caregiver did not change across repeated measures for N= 6,971 (71%) of families. Additional sample characteristics are reported in Table 1 and Figure 1.

Table 1. *Sample Descriptive Statistics*

	Frequency/Mean (%/SD)			
Variable	*Baseline N = 9,807*	*Y1 N = 9,222*	*Y2 N = 8,987*	*Y3 N = 8,319*
Establish Cannabis Rules				
Rules	2,486 (25%)	2,054 (22%)	1,551 (17%)	1,122 (14%)
No rules	7,272 (75%)	7,121 (78%)	7,325 (83%)	7,071 (86%)
Enforce Cannabis Rules				
Youth Only	1,272 (17%)	1,407 (20%)	1,751 (24%)	1,788 (25%)
Everyone	6,042 (83%)	5,751 (80%)	5,643 (76%)	5,341 (75%)
Perceived Cannabis Access				
Hard	8340 (85%)	7,654 (83%)	6,972 (78%)	6,370 (77%)
Easy	815 (8%)	1,008 (11%)	1,392 (16%)	1,417 (17%)
Don't Know	645 (7%)	550 (6%)	581 (6%)	458 (6%)
Cannabis State Legal Status				
General Adult	1,773 (18%)	-	-	-
Medical Only	5,040 (51%)			
Low THC/CBD	2,993 (31%)			
Parental Monitoring	4.39 (0.52)	4.49 (0.45)	4.48 (0.47)	4.38 (0.50)
Parent Education				
Some High School	673 (7%)	-	-	-
High School Graduate or GED	1,066 (11%)			
Associate's Degree	2,874 (29%)			
Bachelor's Degree	2,700 (28%)			
Master's Degree	1,872 (19%)			
Doctoral/Professional Degree	608 (6%)			
Median Household Income	$75,000 to $99,999	-	-	-
Child Sex				
Male	5,145 (52%)	-	-	-
Female	4,662 (48%)			
Child Age	9.91 (0.62)	10.91 (0.63)	12.02 (0.66)	12.91 (0.64)
Parent Race & Ethnicity				
White (Non-Hispanic)	5680 (59%)	-	-	-
Native American or Native Hawaiian	162 (2%)			
Black or African American	1535 (16%)			
Black and Multiracial	96 (1%)			
Hispanic/Latinx (Non-White)	543 (6%)			
Hispanic/Latinx (White)	1081 (11%)			
Asian	440 (5%)			

Note. Descriptive statistics of final analytic sample. Parental monitoring scale ranges from 1 to 5.

Figure 1. *Percent Endorsement of Establishing Cannabis Rules, Enforcing Cannabis Rules, and Perceived Availability of Cannabis*



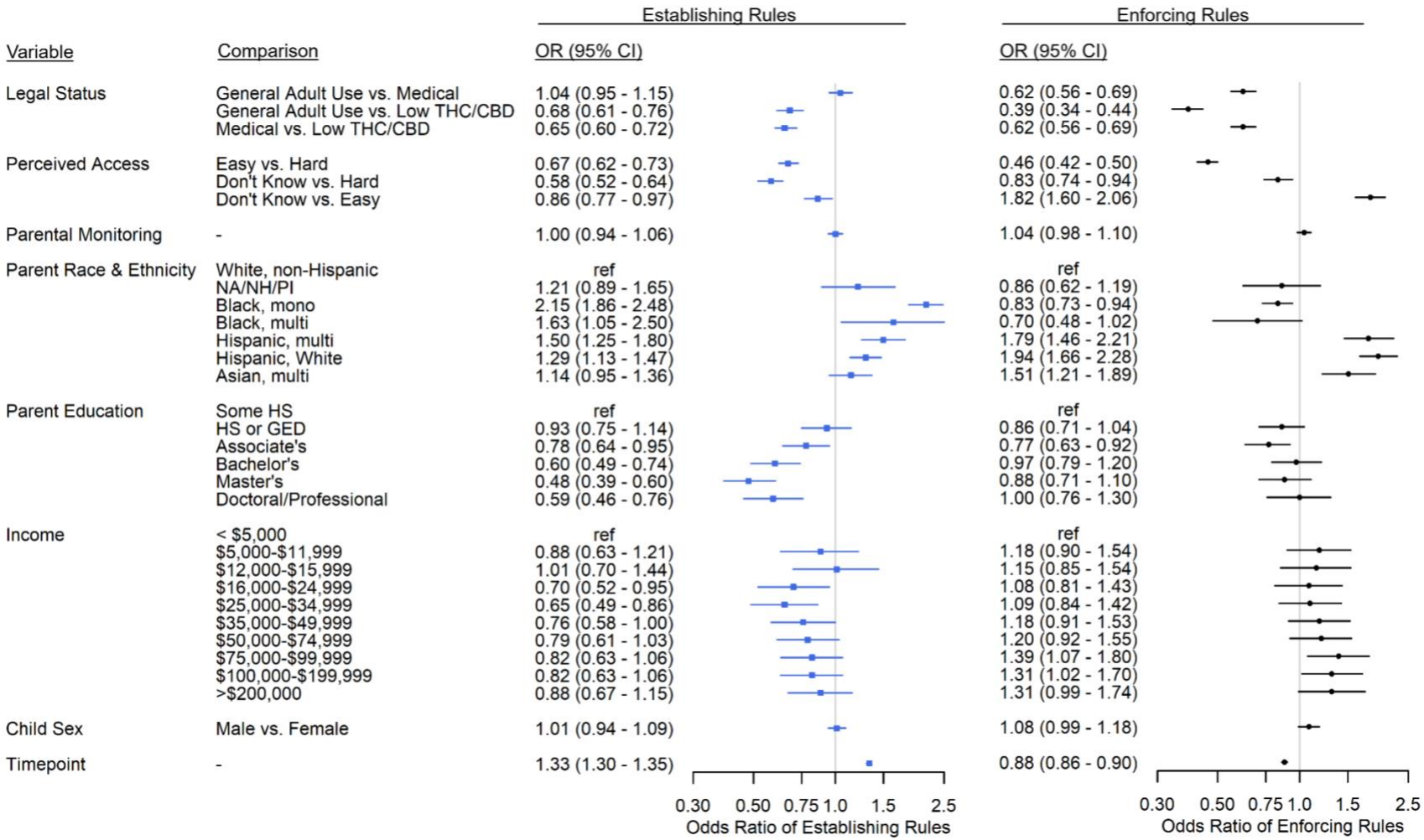
Note. Parent-reported percentage endorsement across annual assessments. Y1-Y3 = Year 1-3 follow up.

Most caregivers endorsed establishing zero tolerance cannabis rules and rates of rule creation significantly increased over time (OR = 1.33, 95% CI [1.30, 1.35]). For parents that did establish rules, most parents also reported that rules were enforced for everyone in the home, though this proportion slightly declined over time. At baseline, most families lived in a state with medical cannabis access (51%), followed by low THC/CBD access (31%) and general adult cannabis access (18%). Cannabis was perceived to be very hard to access by most parents and this slightly decreased over time. Youth endorsed high and stable levels of parental monitoring at each timepoint: baseline $M = 4.39$ ($SD = 0.52$), Y1 $M = 4.49$ ($SD = 0.45$), Y2 $M = 4.48$ ($SD = 0.47$), and Y3 $M = 4.38$ ($SD = 0.50$).

State Legal Status

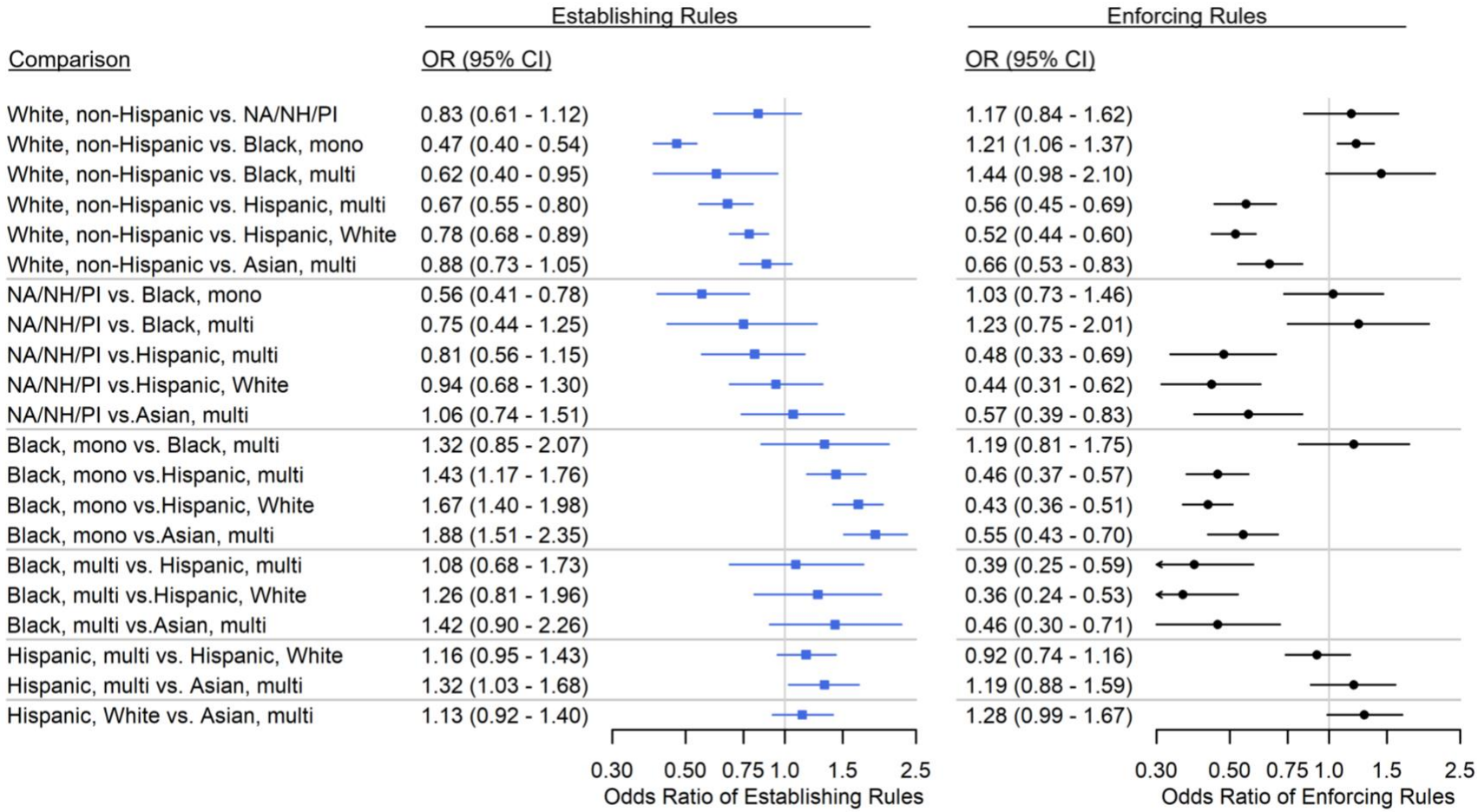
All results from both GEE logistic analyses are reported in Figure 2 and Figure 3. Generally, lenient state cannabis laws were associated a lower likelihood of establishing rules and enforcing them for everyone in home. Specifically, caregivers had *lower* odds of establishing rules when cannabis was legal for general adult use (OR = 0.68, 95% CI [0.61, 0.76]) and medical use (OR = 0.65, 95% CI [0.60, 0.72]) compared to low THC/CBD laws. Among caregivers who endorsed establishing cannabis rules, they had *lower* odds of enforcing rules for everyone when cannabis was legal for general adult use compared to medical (OR = 0.62, 95% CI [0.56, 0.69]) and low THC/CBD (OR = 0.39, 95% CI [0.34, 0.44]) legalization. Caregivers also had *lower* odds of enforcing rules for everyone in the context of medical compared to low. THC/CBD legalization (OR = 0.62, 95% CI [0.56, 0.69]).

Figure 2. *GEE Logistic Model Results*



Note. Models predicted the odds of establishing cannabis rules (versus no rules in the home) and enforcing rules for everyone in the home (versus rules enforced for youth only), respectively. Statistically significant effects do not include 0 in the confidence limit. Multi = multiracial (more than one race); Mono = monoracial (only one race); His = Hispanic; NA/NH/PI = Native American/Native Hawaiian/Pacific Islander; OR = odds ratio; CI = confidence interval.

Figure 3. *GEE Logistic Model Results–Caregiver Race and Ethnicity Comparisons*



Note. Models predicted the odds of establishing cannabis rules (versus no rules in the home) and enforcing rules for everyone in the home (versus rules enforced for youth only), respectively. Statistically significant effects do not include 0 in the confidence limit. Multi = multiracial (more than one race); Mono = monoracial (only one race); His = Hispanic; NA/NH/PI = Native American/Native Hawaiian/Pacific Islander; OR = odds ratio; CI = confidence interval.

Perceived Youth Access to Cannabis

Overall, perceiving cannabis to be hard to access was associated with a higher likelihood of establishing cannabis rules and enforcing them for everyone in the home. Caregivers had *lower* odds of establishing rules when access was perceived as easy (OR = 0.67, 95% CI [0.62, 0.73]) or they did not know (OR = 0.58, 95% CI [0.52, 0.64]) compared to hard access. Odds of establishing rules were also *lower* when cannabis access was not known compared to easy access (OR = 0.86, 95% CI [0.77, 0.97]). Among caregivers who established rules, caregivers had *lower* odds of enforcing rules for everyone when they perceived access to cannabis for youth as easy compared to hard (OR = 0.46, 95% CI [0.42, 0.50]). Odds were *lower* for enforcing rules for everyone when caregivers did not know about access compared to hard access (OR = 0.83, 95% CI [0.74, 0.94]) but *higher* compared to easy access (OR = 1.82, 95% CI [1.60, 2.06]).

Parental Monitoring

Parenting monitoring was not significantly associated with establishing cannabis rules (OR = 1.00, 95% CI [0.94, 1.06]) or enforcing cannabis rules (OR = 1.04, 95% CI [0.98, 1.10]).

Sensitivity Analysis

Results for the sensitivity analysis are reported in Supplemental Table S3 The overall pattern of results did not change when conducting the analyses only with the subsample of participants for whom the reporting caregiver did not change across timepoints (n = 6,971, 71% of the sample). The only exception was that caregivers in this subsample who perceived easy access to cannabis had similar odds of establishing rules as caregivers who did not know about the child's access to cannabis (OR = 1.11, 95% CI [0.98, 1.26

DISCUSSION

The current study aimed to understand contextual factors associated with whether caregivers establish and enforce rules about cannabis use in the home for their adolescent children. Data from the ABCD Study was leveraged to test associations in a large and diverse sample of predominantly cannabis-naïve youth and their caregivers. Overall, endorsement of establishing zero-tolerance cannabis rules was quite high and increased over time (75% at baseline to 86% by Y3). The high prevalence suggests that most caregivers proactively established cannabis rules well before the large majority of this sample (n= 19 by Y3) and most other adolescents initiate cannabis use (Chen et al., 2016). High and increasing endorsement of rules may also reflect maintenance and restating of rules in anticipation or in response to increased risk factors for cannabis initiation. Caregivers are likely cognizant of increasing knowledge and curiosity about cannabis among adolescents as well as peer use becoming more prominent as they age (Caouette & Feldstein Ewing, 2017; Harrison et al., 2024). It could also reflect increased normalization of addressing cannabis as a parent in response to shifting cannabis policy and norms in the U.S. Similar to alcohol, cannabis may be more salient to parents and caregivers who are then motivated to address it through proactive rule setting. Rule enforcement for everyone in the home was also high but declined over time (83% at baseline to 76% at Y3). Caregivers consistently employed rules to prevent underage use, but may become more lenient toward adult use in the home as adolescents age, perceptions of the harms of cannabis decrease, or cannabis becomes more ubiquitous in the U.S. (Mennis et al., 2023; Wilson & Rhee, 2022).

State Legal Status

It was hypothesized that in states with more lenient cannabis laws, there would be higher odds of (1) adopting zero-tolerance rules, and (2) enforcing rules for everyone in the household. Contrary to these hypotheses, we found *lower* odds of establishing cannabis rules when cannabis was legal for general adult use and medically legal compared to low THC/CBD legalization. Among caregivers who did establish rules, we found *lower* odds of enforcing rules for everyone when cannabis laws were more lenient (general adult use compared to medical and low THC/CBD, and medical compared to low THC/CBD). Prior work suggests changes in cannabis legal status may prompt parents to increase their cannabis-specific parenting strategies (Eisenberg et al., 2019; Jones

et al., 2020). Although we did not assess change in legal status, our results may contrast these findings. Perhaps parenting changes do not persist beyond the initial post-legalization increase as parents and others adopt more positive attitudes about cannabis (Wilson & Rhee, 2022). Alternatively, many of these studies were qualitative and explicitly asked about changes in parenting following cannabis legalization which may have increased pressure to respond in socially desirable ways. Caregivers in our study were not primed to discuss parenting post-legalization and thus may have responded differently.

Interestingly, no difference was observed in establishing rules when cannabis was legal for general adult use compared to when it was legal for medical use. This could reflect an overlap in general adult and medical status (i.e., if cannabis is legal for general adult use, then it is also legal medically), suggesting the lower odds of establishing rules may be driven by medical status. This explanation is consistent with prior work demonstrating favorable attitudes toward medicinal cannabis and treating medical and psychiatric symptoms being a common motivation for cannabis use among caregivers (Satchell et al., 2023; Thurstone et al., 2013). However, evidence suggests general adult legal status may confer more risk for elevated adolescent cannabis use compared to medical legal status (Pawar et al., 2024), suggesting other risk factors may compound above and beyond the protective effect of cannabis rules when cannabis is legal for general adult use.

State cannabis legalization associations should be interpreted with caution, as states were categorized based on the year that cannabis sales or medical prescriptions were allowed. Some participants may have been assessed prior to a change in regulation within the same year (Ross et al., 2021). Legal status categories were also broad. The legalization process is not uniform and may differ in form (e.g., tax structure, THC potency limits, qualifying conditions for medical use), timing (e.g., legal approval to retail sale delays), and culture (e.g., political messaging, identity and stigma; Athanassiou et al., 2023; Hall & Lynskey, 2016). The current measure of legalization was unable to capture these nuances, and future work should seek to explicitly model pathways through which legalization influences parents' cannabis socialization strategies, like establishing and enforcing rules.

Perceived Youth Access to Cannabis

We hypothesized that perceived easier access to cannabis for youth would be associated with *higher* odds of establishing and enforcing rules. Contrary to these hypotheses, we found that caregivers had *higher* odds of establishing rules and enforcing rules for everyone when they perceived cannabis was hard to access for youth, compared to perceiving easy access or not knowing if cannabis was accessible to youth. Given the high endorsement of establishing and enforcing rules for everyone across timepoints, caregivers who perceived hard access may generally view their rules as effective at reducing access for youth when they are zero-tolerance and apply consistently to everyone in the home. Caregivers also generally perceived cannabis as hard to access for youth (85-77% across baseline to Y3), which is corroborated by the extremely low endorsement of youth cannabis initiation (<1% by Y3), suggesting rules may indeed drive delayed access to cannabis. Similarly, perceptions of easy access may reflect permissive attitudes toward cannabis and the feeling that rules are not necessary or effective at offsetting the risk of cannabis access. The presence of individuals who use cannabis in the home or other proximal contexts (e.g., parents, other adult family members, peers or adults in the community) may also increase perceptions of easy access and limit perceived rule effectiveness. These caregivers may be more likely to adopt other strategies that are focused on harm reduction or psychoeducation rather than zero-tolerance and abstinence, such as communication about the risks of underage use (Khachikian & Cameron, 2019; Sternberg et al, 2019).

Not knowing about access predicted *lower* odds of establishing rules compared to both hard and easy access, suggesting parents who do not know about access may be less proactive in establishing cannabis rules. However, not knowing about access predicted *lower odds of enforcing rules for everyone* compared to hard access*,* but *higher odds of enforcing rules for everyone* compared to easy access. This further lends support to the explanation that caregivers' own use or awareness of other adult cannabis use

in the home may influence how they enforce rules for youth versus adults. Conclusions related to the "don't know" response should be interpreted cautiously because it could represent varying underlying motivations across participants, such as uncertainty about selecting a response, disengagement when answering the question, or lack of exposure to cannabis or sources of access.

Parental Monitoring

We hypothesized that parents would have *higher* odds of (1) establishing rules to disallow youth cannabis use and (2) enforcing rules for everyone in the home when parental monitoring was high. In contrast to our hypotheses, parental monitoring was not associated with establishing or enforcing cannabis rules. Caregivers may make zero-tolerance rules proactively, such that rules are established regardless of what parents learn through their monitoring. Establishing and enforcing cannabis rules may also be driven by other factors, such as legalization and attitudes about cannabis. Mixed method variance may contribute to these null associations, as monitoring was also the only youth-reported variable. However, we caution over-interpretation of the null associations given the poor reliability of the PMQ in the ABCD sample (also see Huynh et al., 2026).

Caregiver Race and Ethnicity

Some notable group differences in establishing and enforcing cannabis rules were observed between caregivers of different racial and ethnic identities (see Figure 3). Specifically, non-Hispanic White caregivers were *less likely* to establish rules compared to most groups, whereas Black (monoracial) caregivers were *more likely* to establish rules compared to most other groups. Caregivers who identified as Black or identified as Native American, Native Hawaiian, or Pacific Islander were *less likely* to enforce rules for everyone compared to most other groups. Although we do not have sufficient data to explain these unique group effects, we felt it was important to highlight these observed differences. Youth from minority racial and ethnic groups are observed to experience disproportionally higher negative health and legal outcomes from cannabis use (Lee et al., 2021; Montgomery et al., 2022; Wu et al., 2014; Yang et al., 2024). Future research should seek to better understand how minoritized caregivers navigate cannabis socialization within the context of interpersonal and systemic racial discrimination that contributes to these health disparities by explicitly modeling factors unique to each racial and ethnic group (Cardenas-Iniguez & Gonzalez, 2024; Earp et al., 2021; Joshi et al., 2023; Villagrana & Lee, 2018).

Limitations and Future Directions

Limitations of the current study warrant discussion. First, parental cannabis use was not assessed. The current literature is mixed on how parental cannabis use is associated with cannabis-specific parenting strategies. Some work finds no association (Sternberg et al., 2019), yet other work suggests some parents who use cannabis themselves may be more likely to endorse cannabis-specific parenting strategies, such as emphasizing house rules, and prohibiting cannabis use near their children (Mason et al., 2015), while others may be more accepting and permissive toward child or other adult cannabis use in the home (Dopke et al., 2023). Second, the current dataset did not assess adolescents' report of parental rules. Parent and youth perceptions of parenting behaviors may each offer unique clinical utility in predicting adolescent cannabis use and caregivers, compared to youth, may overreport socially desirable parenting strategies (Micalizzi et al., 2022; Miller at al., 2013). A useful future direction will be to integrate youth's perspectives on understanding risk factors for establishing and enforcing cannabis rules. Third, the current study focused on modifiable risk factors, but perhaps other relevant predictors of rules, such as individual (e.g., personality, attitudes) and contextual (e.g., neighborhood factors, social support) factors, are important to consider. Fourth, the ABCD Study utilizes a large sample, suggesting small, and less meaningful effects may be observed as statistically significant. It is important to rely on effect sizes, robust patterns of findings, and consistency with theory and prior work when interpreting results. Fifth, several items were modified from the original versions (i.e., establishing and enforcing rules, cannabis access, state legalization status). While this was done for practical reasons due to small cell sizes and with the goal of improving

conceptual clarity, some nuance and meaningful differences in how these constructs are associated with one another may have been lost. Importantly, as noted previously, the parental monitoring scale exhibited poor reliability, suggesting caution in interpreting the null effects. It will be important for future work to use reliable scales when assessing monitoring and other parenting constructs. Finally, baseline data was collected in 2016. Cannabis policy, cannabis product diversity, and prevalence and social norms have evolved substantially since then (Caulkins, 2024; Spindle et al., 2019). Recreational cannabis use by adults was first legalized in Colorado and Washington in 2012, suggesting the current associations are more reflective of early legalization-era dynamics which may differ from the current U.S. cannabis landscape. Collecting contemporary data that reflect current cannabis socialization contexts, as well as longitudinal designs that capture temporal shifts in legal status and socialization strategies will be important goals for future research.

Conclusion & Implications

Overall, caregivers were most likely to establish zero-tolerance rules, enforce them for everyone in the home, and perceive cannabis to be hard to access for youth, suggesting the most typical presentation for rule setting among caregivers is the most adaptive. Caregivers and parents may benefit from family-based prevention messaging that reinforces continued rule enforcement or provides guidance on how to discuss and implement cannabis rules proactively. Importantly, the current findings highlight that the potentially lowest risk contexts (i.e., low THC/CBD legal status, hard access) are associated with greater cannabis rule establishment and enforcement. Caregivers in riskier contexts may also benefit from interventions that help them navigate more complex circumstances, such as when caregivers themselves or other adults in the home use cannabis or confusing legal contexts. Prevention messaging and interventions will be particularly important to implement for caregivers in states that transition to more lenient laws (e.g., medical and general adult legalization) where cannabis will become increasingly normalized and accessible for youth.

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