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Changes in Parent-Student Text Message and Phone Call Communication During the Transition to College as Predictors of Cannabis and Simultaneous Use During the First Year

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ABSTRACT

Parent communication can be protective against cannabis use among young adults. However, changes in parent-student communication frequency naturally occur during the transition from high school to college. Recent research suggests declines in parent-student communication frequency predict increased drinking and consequences during the first year of college, yet these effects on other risky behaviors are unknown. The current study investigated whether post-matriculation changes in frequency of texting/calling with parents predict cannabis use and simultaneous use of cannabis and alcohol, and whether pre-matriculation cannabis and simultaneous use predict changes in communication. First-year students (N = 287, 61.3% female, 50.9% White) reported cannabis and simultaneous use pre- and post-matriculation (T1 & T3) and changes in frequency of texting/calling their mother/father per day (T2). Negative binomial hurdle models examined whether T2 changes in communication frequency predicted T3 cannabis and simultaneous use, and logistic regression models examined whether T1 cannabis and simultaneous use predicted T2 changes in communication frequency. Results revealed that increasing (vs. decreasing) frequency of calling with mothers and texting with fathers was protective against cannabis use, whereas increasing frequency of calling with fathers was associated with greater risk of use. Changes in communication did not significantly predict simultaneous use, nor did pre-matriculation cannabis or simultaneous use predict changes in either mode of communication with parents during the college transition. These findings highlight that changes in mother and father communication may be both beneficial and detrimental to cannabis use depending on the parent and mode of communication. Implications for these findings are discussed.

Key words: = cannabis; college student; parent communication; text message; phone call

Cannabis use is prevalent among U.S. college students, with 43.9% reporting past year use and 24.5% reporting past 30-day use (Schulenberg et al., 2021). Using cannabis and alcohol simultaneously so that their effects overlap (simultaneous use) is also common, with approximately 20% of college students reporting simultaneous use in the past 30 days (Looby et al., 2021). Negative consequences associated with cannabis use include driving while high, decreased physical activity, and feeling in a fog the morning after use (Bravo et al., 2019; Pearson

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et al., 2017). Cannabis is also directly and indirectly associated with a range of academic outcomes including skipping class, achieving a lower GPA, and increased time to graduate from college (Arria et al., 2015). Simultaneous use may be more harmful, with studies indicating that combining cannabis and alcohol is associated with more consequences than using either substance separately (e.g., Jackson et al., 2020; Yurasek, Aston, et al., 2017), perhaps accounted for by the amount of alcohol consumed on simultaneous use occasions (e.g., Mallett et al., 2019). The transition into college is a critical period in which cannabis and alcohol use increase (Fromme et al., 2008), riskier substance use trajectories can be established (Arria et al., 2016; Caldeira et al., 2012), and interventions targeting risky behaviors can be effectively implemented (e.g., parent-based interventions [PBIs]; Turrisi et al., 2001). Thus, it is important to understand factors associated with increased risk for cannabis and simultaneous use that can be targeted in interventions delivered during the transition to college.

Parent-Student Communication and Cannabis Use

General parent-student communication can be loosely defined as the exchange of any information, ideas, or feelings between parents and their children. This type of communication can be protective against cannabis use among young adults. Cardenas et al. (2022) found that a low frequency of general parent-child communication was associated with being a heavy cannabis user (compared to being a low/non-user). However, over half of these participants were living with their parents and less than a quarter were enrolled in a 4-year college at baseline, and the situational differences between young adults and matriculating college students (e.g., moving away from home) prevent these findings from generalizing. Cardenas et al.'s (2022) composite measure of communication included methods irrelevant to college students living outside their parents' home (e.g., in-person contact), which further hinders the relevance of these findings to college students. While there are no published studies that have investigated the effects of general parent-student communication on simultaneous use, research has indicated drinking-related parenting variables can indirectly reduce simultaneous use (e.g., parental alcohol permissiveness; Trager et al., 2021). Thus, other parenting variables, such as general communication—which impacts both cannabis use (Cardenas et al., 2022) and alcohol use (LaBrie & Cali, 2011; Small et al., 2011)—are also likely to reduce simultaneous use.

Text messages and phone calls are college students' primary methods of communication with their parents (McCurdy et al., 2022), which is unsurprising given the ubiquity of smartphones among young adults (Sidoti et al., 2024). Despite this, there are no published studies that examine the impact of general parent-student communication specifically via texts and calls on cannabis or simultaneous use among incoming college students. Most parents of college-aged individuals report communicating via text (73%) or phone (54%) with their young adult children several times per week (Minkin et al., 2024). In line with this, a study by Jensen and colleagues (2021) focusing on a racially diverse sample of college students, all of whom had previous experience with alcohol, found an average daily text exchange of 8 messages with mothers and 3 with fathers. Further investigation into these communication patterns reveals that the frequency of text messaging between parents and students does not influence the students' perceptions of parental autonomy support (Brown et al., 2023). This suggests that texting offers parents a means to maintain contact with their college-aged children without compromising their sense of independence. While some research suggests this may not be the case for phone calls (Racz et al., 2017; Weisskirch, 2009), participants in these studies were younger adolescents, presumably living with their parents, and these data were collected over a decade ago, which calls into question the relevance of these findings today given the constantly evolving nature of technology.

Although the relationships between changes in parent-student digital communication and cannabis and simultaneous use have yet to be explored, research suggests that students whose frequency of texting/calling their parents increased or remained the same (vs. decreased) two months into college had lower odds of drinking and experiencing negative consequences 6 months later in their second semester of college

(Trager et al., 2023a). This suggests that continued digital communication with one's parents can be protective against alcohol-related risks in college (see Turrisi & Ray, 2010 for similar findings with other parenting constructs) and research is necessary to determine if these protective effects extend to cannabis and simultaneous use as well. Trager and colleagues (2023a) also explored the inverse causal relationship—if pre-matriculation alcohol use predicted changes in communication frequency during the first semester—and found that heavy drinkers had lower odds of increasing or maintaining their frequency of texting their mothers (vs. decreasing) during their first semester of college. Given Trager et al's (2023a) findings and the literature described above, we might expect that changes in parent-student digital communication could predict college students' cannabis and simultaneous use, and that pre-matriculation cannabis and simultaneous use would affect college-bound young adults' digital communication frequency with their parents.

Prior studies suggest that parenting style and communication can differ between mothers and fathers, and these differences might influence adolescent and young adult cannabis use. For instance, studies have revealed that mothers' permissiveness toward cannabis use (but not fathers') can be associated with greater odds of lifetime cannabis use among students between 14 and 21 years of age living with their parents (Kokotovič et al., 2022). With respect to mothers' and fathers' communication in predicting adolescent cannabis use, research has revealed that adolescent boys who reported that talking to their fathers was easy (vs. difficult) had lower odds of past 30-day cannabis use (Luk et al., 2010). However, this relationship was not significant among girls, nor were there any significant effects of mothers' communication. Taken together, these differences suggest that the nuances in mothers' and fathers' behaviors toward their children warrant separate examination in our current study. Understanding these distinct influences could provide more precise insights into parental impacts on adolescent cannabis use, which are lacking in the literature.

Cannabis Interventions for College Students

While there are several cannabis interventions in the college literature (e.g., Elliott & Carey, 2012; Elliott et al., 2014; Lee et al., 2010, 2013; Palfai et al., 2014; Riggs et al., 2018), all of which used personalized normative feedback in an attempt to correct overestimations of peers' cannabis use, only one was designed for incoming students (Lee et al., 2010) and it did not impact cannabis use. In contrast, PBIs designed to prevent risky drinking that are administered during the transition into college can have secondary effects on cannabis use when given in combination with a brief motivational intervention (BMI; Grossbard et al., 2010). However, alcohol BMIs in isolation fail to influence cannabis use (White et al., 2015; Yurasek, Merrill, et al., 2017). This suggests the PBI component of Grossbard et al.'s (2010) intervention may have been responsible for changes in students' cannabis use. PBIs promote general parent-student communication in addition to providing alcohol-focused resources, which may explain their influence on cannabis use. To test the idea that parent-student communication contributes to college students' cannabis use, the current study explored the relationship between changes in students' digital communication (via text messages and phone calls) with their parents and cannabis and simultaneous use during the transition to college.

Current Study

Using data from Trager et al. (2023a), the current study investigated whether changes in parent-student communication frequency via text messages and phone calls during the first month of college (T2) result in changes in cannabis and simultaneous use during the second semester of college (T3). We also explored whether pre-matriculation cannabis and simultaneous use (T1) predicted changes in parent-student communication following the transition to college (T2). The effects of an alcohol-specific PBI, FITSTART+ (see LaBrie et al., 2024), on cannabis and simultaneous use and on changes in communication were also explored here. Based on the research described thus far, we hypothesized that relative to students whose frequency of texting/calling their parent(s) decreased during the first month of the first semester of college, those whose communication frequency stayed the same or increased would have lower odds of cannabis and simultaneous use during their second semester. We also hypothesized that

compared to those who had never engaged in cannabis or simultaneous use in the pre-matriculation summer months, those who had would have lower odds of increasing or maintaining their level of communication with their parents (vs. decreasing) during the first semester of college. Although some research suggests parental communication with mothers vs. fathers may produce differing effects on cannabis use, differences in associations between mothers' and fathers' communication were exploratory.

METHODS

Recruitment and Procedures

As part of a larger RCT testing the effects of a college alcohol PBI (FITSTART+; see LaBrie et al., 2024), incoming first-year students at a private university on the West Coast of the United States were recruited to take part in a longitudinal survey study. Participants were invited to participate in the study if they were an incoming first-year student under the age of 21 who had a parent email on file with admissions at the study institution. Participants who completed the baseline survey in July 2021 (T1; N = 391) were invited to complete follow-up surveys in October 2021 (T2) and February 2022 (T3). Following the T1 survey and prior to matriculation, participating students' parents were invited to sign up for an online parenting program. Approximately 70% of parents who were invited volunteered and signed up for the program that they were randomized into (either the intervention or control version of FITSTART+). Given that all students who participated at T1 were invited to complete the follow-up surveys, students were classified into one of three groups: (1) those with a parent who volunteered and was randomized to the intervention program (intervention group), (2) those with a parent who volunteered and was randomized to the control program (control group), and (3) those whose parent did not volunteer (no parent group). Students received a $25 gift card for each survey they completed and a bonus $25 gift card if they completed all three surveys.

Participants included in the present study (analytic N = 287) were those who completed one of the four predictors (T2 items assessing changes in communication with their parents; see Measures), one of the two outcome measures (T3 cannabis or simultaneous use), and all covariates (T1 & T2). Students in the overall sample who did not meet these criteria (n = 104) were more likely to report having ever engaged in simultaneous use at T1 compared to those included in the current analyses (χ^2 (1) = 5.22, p = .022); students did not significantly differ on any other variables included in the current analyses (ps > .05).

Participants

Participants (N = 287) were majority female at birth (birth sex; 61.3%), identified as female (gender identity; 61.0%; 38.3% male, 0.7% other) and were between the ages of 17 and 20 years (M_{age} = 17.90; SD_{age} = 0.41). The sample was racially (50.9% White; 19.2% multiracial; 14.3% Black/African American; 12.5% Asian; 0.3% Native Hawaiian/Pacific Islander; 0.3% American Indian or Alaska Native; 2.4% missing) and ethnically (26.1% Hispanic; 73.9% non-Hispanic) representative of the research institution's student body. Most participants also reported that their parents were married (74.9%), and the majority of students did not live with a parent at T2 (97.7%).

Measures

To determine which parent(s) participants had any sort of communication with, they were asked how often they see or communicate with their [mother/father] in person or online at T2. Participants who indicated that they "never" communicated with a specific parent were not asked any subsequent questions about that parent, and their parent communication data were treated as missing. No participants indicated "never" communicating with both parents. Descriptive statistics for all study variables can be found in Table 1.

Table 1. *Descriptive statistics for all study variables.*

	M / *n*	*SD* / %
Since you started college, has the amount you text your mother per day… (T2)		
Decreased	46	16.1%
Stayed the same	97	34.0%
Increased	142	49.8%
Since you started college, has the amount you text your father per day… (T2)		
Decreased	43	15.6%
Stayed the same	139	50.4%
Increased	94	34.1%
Since you started college, has the amount you call your mother per day… (T2)		
Decreased	31	11.0%
Stayed the same	119	42.3%
Increased	131	46.6%
Since you started college, has the amount you call your father per day… (T2)		
Decreased	40	14.7%
Stayed the same	137	50.2%
Increased	96	35.2%
Have you ever used marijuana/cannabis? (T1)		
Yes	109	38.1%
No	177	61.9%
How many days have you used marijuana/cannabis to get high in the past 30 days? (T1)	1.47	4.60
How many days have you used marijuana/cannabis to get high in the past 30 days? (T3)	2.65	6.38
Have you ever used marijuana/cannabis to get high at the same time as alcohol – that is, so that their effects overlapped? (T1)		
Yes	51	17.8%
No	236	82.2%
How many days (in the past 30) did you use marijuana/cannabis at the same time as alcohol – that is, so that their effects overlapped? (T1)	0.19	0.66
How many days (in the past 30) did you use marijuana/cannabis at the same time as alcohol – that is, so that their effects overlapped? (T3)	0.59	1.59
Drinker status (T1)		
Tried alcohol	204	71.1%
Never tried alcohol	83	28.9%
Text messages exchanged with mother per day (T2)	6.50	5.08
Text messages exchanged with father per day (T2)	3.90	4.07
Phone calls exchanged with mother per day (T2)	2.07	2.11
Phone calls exchanged with father per day (T2)	1.24	1.49

Changes in Frequency of Texting & Calling Parents (T2)

Participants answered four questions to assess changes in their texting and calling behaviors with their parents: "Since you started college, has the amount you [text/call] your [mother/father] per day..." "Decreased," "Stayed the same," or "Increased."

Cannabis Use (T1 & T3)

At baseline, participants were asked if they had ever used marijuana/cannabis (Yes/No).[1] At T1 and T3, they were asked "How many days have you used marijuana/cannabis to get high in the past 30 days?" Answer options ranged from 0–30 days.

Simultaneous Cannabis and Alcohol Use (T1 & T3)

Participants were asked at baseline, "Have you ever used marijuana/cannabis to get high at the same time as alcohol – that is, so that their effects overlapped?" (Yes/No). At T1 and T3, they were asked how many times in the past 30 days they used marijuana/cannabis at the same time as alcohol (0–30).

Drinker Status (T1)

Students were asked to indicate which of the following six statements best described their

[1]Although cannabis use in the current sample may seem low (38%), this is a higher percentage than what has been reported in a nationally representative sample of college students (24.5%; Schulenberg et al., 2021).

drinker status: "I have never tried alcohol"; "I am an abstainer (I do not drink at all but have tried before)"; "I am a [light/moderate/heavy/problem] drinker." Responses were dichotomized based on whether students reported never trying (0) or trying alcohol (1).

Frequency of Daily Texts & Calls Exchanged with Parents (T2)

To control for frequency of texts and phone calls between students and their parents in our models, participants were asked eight items assessing how many text messages and phone calls they sent to and received from their mother and father on average per day (e.g., texts sent to father per day; phone calls received from mother per day). Response options for each item were 0–10+. Because texting and calling are reciprocal behaviors, the number of text messages/phone calls sent to and received from each parent were highly correlated (*r*s = .77–.92), and in line with previous research (Brown et al., 2023; Jensen et al., 2021), the number of text messages/phone calls sent to and received from each parent were summed to create measures of daily text message and phone call communication frequency with mothers and fathers (four items).

Analytic Plan

To examine whether decreases in mother-/father-student phone calling and text messaging during the first few weeks of college influenced students' subsequent cannabis and simultaneous use, we conducted two negative binomial hurdle models in MPlus (version 8). The components of hurdle models include (a) a count component that models only the positive counts (count portion), and (b) a binary component to examine the probability of observing a zero versus a positive count (zero portion). Models examined either T3 cannabis use or T3 simultaneous use as the outcome and focused on mother and father communication as predictors. Texting and calling were included in the same models to understand the relative importance of each digital communication method. Covariates in the models included demographic variables previously associated with cannabis use (i.e., birth sex, race, ethnicity; Goodwin & Silverman, 2024; Hasin et al., 2019), whether students had ever tried cannabis (T1), cannabis use in the past 30 days (T1; cannabis model), simultaneous use in the past 30 days (T1; simultaneous model), whether students had ever tried alcohol (T1), and frequency of daily texts and calls exchanged with each parent (T2). Additionally, study condition was dummy coded to serve as a covariate, with the intervention and no parent groups being compared to the control group in each model.

Four logistic regression models were then conducted to test whether pre-matriculation cannabis or simultaneous use predicted changes in communication with parents during the first semester. Each model specified having used cannabis in the past 30 days (T1) and having engaged in simultaneous use in the past 30 days (T1) as the predictors and examined a different parent communication outcome (i.e., changes in mother texting, mother calling, father texting, and father calling). To assess the impact of the intervention and no parent groups relative to the control group, study condition variables were dummy coded and included in each model, alongside the demographic covariates included in the previous set of models. In all models, variance inflation factors (VIFs) for non-categorical variables were < 5 (James et al., 2013).

RESULTS

Changes in Parent Communication Predicting Cannabis Use and Simultaneous Use

For the count portion of the cannabis use model, among students who did use cannabis at T3, those whose communication via calling increased (vs. decreased) with their mothers since starting college (T2) demonstrated lower risk of cannabis use in the past 30 days at T3 ($RR = 0.31$, $SE = 0.50$, $p = .018$). However, an increase in calling with the father since starting college (vs. decrease) was associated with a higher risk of cannabis use at T3 ($RR = 4.03$, $SE = 0.42$, $p = .001$). Students who reported having ever used cannabis at T1 were also at a higher risk for cannabis use in the past 30 days at T3 ($RR = 3.26$, $SE = 0.39$, $p = .002$) (Table 2).

In the zero portion of the cannabis use model, students who reported greater daily calling with their mother had higher odds of remaining zero on cannabis use in the past 30 days at T3 ($OR = 1.47$, $SE = 0.17$, $p = .027$). Those whose texting with

their father increased (vs. decreased) had higher odds of remaining zero on cannabis use in the past 30 days at T3 (*OR* = 6.06, *SE* = 0.72, *p* = .012). Students who reported having ever used cannabis (*OR* = 0.08, *SE* = 0.50, *p* < .001), as well as those who reported having ever tried alcohol (*OR* = 0.21, *SE* = 0.68, *p* = .022), had lower odds of remaining zero on cannabis use in the past 30 days at T3. Additionally, White students had higher odds of remaining zero on cannabis use in the past 30 days (*OR* = 2.31, *SE* = 0.42, *p* = .047) (Table 2).

In the simultaneous alcohol and cannabis use model, changes in calling or texting with mothers and fathers did not predict simultaneous use in either the count or zero inflated portions of the model. However, the count portion revealed that students who reported greater daily calling with their fathers at T2 had an increased risk for reporting simultaneous use at T3 (*RR* = 1.45, *SE* = 0.16, *p* = .023). Having a parent in the intervention group (vs. control) was also found to be associated with fewer simultaneous use days at T3 (*RR* = 0.52, *SE* = 0.34, *p* = .050). In the zero portion of the model, students who reported greater daily calling with their mother had higher odds of remaining zero on simultaneous use at T3 (*OR* = 1.47, *SE* = 0.19, *p* = .047). Those who had reported ever using cannabis at T1 also had lower odds of remaining zero on simultaneous use days at T3 (*OR* = 0.11, *SE* = 0.57, *p* < .001) (Table 3).

Table 2. *Results from the hurdle model assessing the effects of changes in parent-student text and phone calling on student subsequent cannabis use.*

				95% CI						95% CI	
	RR	*SE*	*p*	LB	UB		*OR*	*SE*	*p*	LB	UB
Count Portion	Cannabis Use Days (T3)					Zero Portion	Cannabis Use Days (T3)				
	Mother						Mother				
Texting increased (T2)	1.20	0.54	.732	0.42	3.44	Texting increased (T2)	0.56	0.67	.390	0.15	2.10
Texting stayed the same (T2)	2.54	0.54	.082	0.89	7.24	Texting stayed the same (T2)	1.26	0.57	.682	0.42	3.83
Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Calling increased (T2)	**0.31**	**0.50**	**.018**	**0.12**	**0.82**	Calling increased (T2)	3.42	0.75	.102	0.78	14.89
Calling stayed the same (T2)	0.58	0.53	.302	0.20	1.64	Calling stayed the same (T2)	1.75	0.72	.442	0.42	7.21
Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
	Father						Father				
Texting increased (T2)	0.47	0.46	.097	0.19	1.15	Texting increased (T2)	**6.06**	**0.72**	**.012**	**1.49**	**24.62**
Texting stayed the same (T2)	0.75	0.42	.488	0.33	1.71	Texting stayed the same (T2)	2.07	0.56	.193	0.69	6.21
Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Calling increased (T2)	**4.03**	**0.42**	**.001**	**1.76**	**9.24**	Calling increased (T2)	1.13	0.75	.870	0.26	4.95
Calling stayed the same (T2)	1.40	0.40	.404	0.63	3.09	Calling stayed the same (T2)	0.78	0.66	.707	0.21	2.84
Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
	Covariates						Covariates				
Daily texting – mother (T2)	1.01	0.03	.843	0.94	1.08	Daily texting – mother (T2)	0.99	0.05	.801	0.89	1.09
Daily calling – mother (T2)	0.88	0.18	.448	0.62	1.24	Daily calling – mother (T2)	**1.47**	**0.17**	**.027**	**1.04**	**2.07**
Daily texting – father (T2)	1.03	0.05	.504	0.94	1.13	Daily texting – father (T2)	0.89	0.06	.068	0.79	1.01
Daily calling – father (T2)	1.06	0.23	.813	0.67	1.66	Daily calling – father (T2)	0.91	0.18	.586	0.64	1.29
Cannabis use days (T1)	1.03	0.02	.260	0.98	1.08	Cannabis use days (T1)	0.92	0.07	.256	0.80	1.06
Cannabis ever used (T1)	**3.26**	**0.39**	**.002**	**1.53**	**6.94**	Cannabis ever used (T1)	**0.08**	**0.50**	**< .001**	**0.03**	**0.22**
Tried alcohol (T1)	0.33	0.97	.253	0.05	2.20	Tried alcohol (T1)	**0.21**	**0.68**	**.022**	**0.06**	**0.80**
Birth sex (T1)	1.43	0.29	.225	0.80	2.54	Birth sex (T1)	0.75	0.43	.504	0.33	1.73
White vs. other (T1)	1.07	0.35	.851	0.54	2.13	White vs. other (T1)	**2.31**	**0.42**	**.047**	**1.01**	**5.30**
Hispanic/Latinx (T1)	0.87	0.34	.687	0.45	1.70	Hispanic/Latinx (T1)	0.67	0.50	.417	0.25	1.77
Intervention group	0.85	0.30	.597	0.48	1.53	Intervention group	1.65	0.48	.300	0.64	4.27
No parent group	1.53	0.53	.417	0.55	4.31	No parent group	1.54	0.55	.433	0.53	4.50
Control group	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Control group	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*

Note. **Bold** denotes *p* < .05. Demographic covariates are coded as follows: birth sex: 0 = female, 1 = male; race: 0 = other, 1 = White; ethnicity: 0 = not Hispanic Latinx, 1 = Hispanic/Latinx, intervention group = parent of student participated in RCT and received the FITSTART+ program, no parent group = parent of student did not volunteer to participate in RCT, control group = parent of student participated in RCT and received control program.

Table 3. *Results from the hurdle model assessing the effects of changes in parent-student text and phone calling on student simultaneous use.*

				95% CI						95% CI	
	RR	*SE*	*p*	LB	UB		*OR*	*SE*	*p*	LB	UB
Count Portion	Simultaneous Use Days (T3)					Zero Portion	Simultaneous Use Days (T3)				
	Mother						Mother				
Texting increased (T2)	0.80	0.38	.558	0.38	1.68	Texting increased (T2)	0.88	0.74	.863	0.20	3.78
Texting stayed the same (T2)	1.23	0.38	.588	0.59	2.57	Texting stayed the same (T2)	1.23	0.75	.784	0.28	5.34
Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Calling increased (T2)	1.42	0.45	.435	0.59	3.44	Calling increased (T2)	1.60	0.98	.630	0.24	10.80
Calling stayed the same (T2)	1.79	0.48	.225	0.70	4.55	Calling stayed the same (T2)	1.23	1.04	.845	0.16	9.45
Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
	Father						Father				
Texting increased (T2)	0.41	0.53	.090	0.14	1.15	Texting increased (T2)	1.91	0.78	.406	0.42	8.80
Texting stayed the same (T2)	0.89	0.44	.790	0.38	2.10	Texting stayed the same (T2)	2.30	0.70	.236	0.58	9.13
Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Texting decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Calling increased (T2)	1.18	0.54	.762	0.41	3.41	Calling increased (T2)	2.30	0.95	.378	0.36	14.78
Calling stayed the same (T2)	1.03	0.54	.956	0.36	2.98	Calling stayed the same (T2)	2.37	0.94	.360	0.37	15.05
Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Calling decreased (T2)	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
	Covariates						Covariates				
Daily texting – mother (T2)	0.95	0.04	.139	0.88	1.02	Daily texting – mother (T2)	1.01	0.05	.893	0.91	1.11
Daily calling – mother (T2)	0.83	0.19	.310	0.57	1.20	Daily calling – mother (T2)	**1.47**	**0.19**	**.047**	**1.00**	**2.14**
Daily texting – father (T2)	1.01	0.06	.930	0.90	1.12	Daily texting – father (T2)	0.91	0.06	.135	0.81	1.03
Daily calling – father (T2)	**1.45**	**0.16**	**.023**	**1.05**	**1.99**	Daily calling – father (T2)	1.01	0.21	.976	0.67	1.52
Simultaneous use days (T1)	1.20	0.15	.244	0.88	1.62	Simultaneous use days (T1)	0.72	0.23	.155	0.46	1.13
Cannabis ever used (T1)	1.67	0.48	.287	0.65	4.26	Cannabis ever used (T1)	**0.11**	**0.57**	**< .001**	**0.04**	**0.34**
Tried alcohol (T1)	0.93	0.69	.915	0.24	3.59	Tried alcohol (T1)	0.46	0.79	.321	0.10	2.14
Birth sex (T1)	1.06	0.39	.883	0.49	2.27	Birth sex (T1)	1.41	0.51	.498	0.52	3.79
White vs. other (T1)	0.82	0.40	.627	0.37	1.81	White vs. other (T1)	1.79	0.45	.192	0.75	4.29
Hispanic/Latinx (T1)	0.93	0.36	.832	0.46	1.86	Hispanic/Latinx (T1)	0.87	0.55	.798	0.29	2.56
Intervention group	**0.52**	**0.34**	**.050**	**0.27**	**0.99**	Intervention group	2.33	0.49	.086	0.89	6.14
No parent group	1.17	0.57	.786	0.38	3.57	No parent group	2.38	0.61	.156	0.72	7.93
Control group	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	Control group	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*

Note. **Bold** denotes $p < .05$. Demographic covariates are coded as follows: birth sex: 0 = female, 1 = male; race: 0 = other, 1 = White; ethnicity: 0 = not Hispanic/Latinx, 1 = Hispanic/Latinx, intervention group = parent of student participated in RCT and received the FITSTART+ program, no parent group = parent of student did not volunteer to participate in RCT, control group = parent of student participated in RCT and received control program.

Cannabis Use and Simultaneous Use Predicting Changes in Parent Communication

Pre-matriculation cannabis and simultaneous alcohol and cannabis use did not predict changes in either text or phone call communication with mothers or fathers. However, if a student had tried alcohol, they were less likely to stay the same (vs. decrease) in their frequency of texting with their mother ($OR = 0.27$, $SE = 0.51$, $p = .010$). The same pattern was observed for fathers ($OR = 0.39$, $SE = 0.48$, $p = .049$). Male students (vs. female) were less likely to increase their texting frequency (vs. decrease) with their mothers ($OR = 0.26$, $SE = 0.38$, $p < .001$). Additionally, Hispanic/Latinx students were less likely to increase (vs. decrease) texting frequency with their mothers ($OR = 0.43$, $SE = 0.39$, $p = .030$).[2]

DISCUSSION

The findings of this study highlight that adjustments in communication patterns between first-year college students and their parents through texting and calling can influence cannabis use and its concurrent use with alcohol into the second semester of their first year. Notably, an increase in phone conversations with mothers was associated with a reduced likelihood of cannabis use at follow-up compared to students who reported a reduction in such interactions. Importantly, this association was among students who had recently used cannabis, which suggests the protective effects are not limited to non-users. Regular phone calls with mothers and an uptick in text messaging with fathers during the

[2]Due to space constraints, results for the non-significant findings from these models are not included but will be provided upon request.

transition to college were also predictors of a higher probability of abstaining from cannabis use during the second semester. Contrary to expectations, the study also revealed that an increase in phone calls with fathers during this transitional phase was linked to a heightened risk of cannabis consumption among recent cannabis users. Greater daily phone calls with fathers were also associated with a greater risk of simultaneous substance use. These observations collectively suggest that reducing phone contact with mothers might increase the risk of cannabis use during the first college year, whereas an escalation in phone calls with fathers could indicate a higher risk of cannabis consumption and simultaneous use during the same timeframe.

The underlying rationale for presuming that increased communication through text messages and phone calls with a parent could serve as a deterrent against cannabis use as students transition to college lies in the continuity of parental supervision. Such communication channels are thought to extend the reach of parental monitoring beyond the confines of the home (Jensen et al., 2021). Indeed, parental monitoring has been empirically linked to a direct impact on college students' cannabis consumption (Napper et al., 2015; Pinchevsky et al., 2012; White et al., 2006). However, the current study's findings deviate from previous research by showing that increased phone communication with fathers—possibly interpreted as heightened paternal monitoring—during the college transition period can adversely affect first-year students' cannabis use. A potential explanation for the differing outcomes associated with increased calling with mothers versus fathers might be attributed to the generally lower warmth found in fathers. Prior work has revealed that greater father communication that captures warmth can have protective effects against cannabis use (Luk et al., 2010). Subsequent research has also revealed that greater monitoring by parents who are less warm, and who aim to deter their adolescents from cannabis use, can produce psychological reactance (Brehm, 1966), leading to a stronger intention to use cannabis (Donaldson et al., 2023). Although the specific nature of the communication in our study remains unknown, it is recognized that fathers tend to exhibit less warmth than mothers (Yaffe, 2023) and increased phone calls may symbolize more rigorous monitoring. Hence, increases in phone communications with fathers in this study could have inadvertently exacerbated the risk of cannabis use among students, especially given that this risk was shown to be only found among recent cannabis users.

Additional evidence supporting the warmth-monitoring hypothesis described above can be derived from our finding that illustrates that increases in text messaging with fathers was protective against cannabis use. A reasonable explanation for this could be that the text messaging, which may be perceived by the students as a less intrusive and controlling form of communication (Brown et al., 2023; Jensen et al., 2021; Racz et al., 2017), might mitigate the negative impact of the combination of low warmth and high monitoring that might be occurring with fathers' calling. While these interpretations are conjectural, they underscore the need for future research to confirm the nuanced impacts of different forms of parent-child communication on college student cannabis use. One valuable approach could be the use of ecological momentary assessment (EMA) as a method to gather real-time data on the nature and impact of these communications. Future studies should aim to explore the specific content and context of text and phone communications, as well as the emotional quality of parent-child relationships, to better understand how they influence cannabis use behaviors.

The findings from our study present a complex picture of parental communication's impact on college students' cannabis use, highlighting a protective effect of increased communication from mothers against cannabis use, while, conversely, noting that increased communication from fathers is associated with a higher risk of cannabis use and simultaneous use. This dichotomy underscores the importance of a nuanced examination of parental influence that goes beyond the aggregated data approach commonly found in the literature (e.g., Cardenas et al., 2022; Grossbard et al., 2010; Small et al., 2011), which combines the effects of both parents without distinction. Such aggregation may mask the distinct influences mothers and fathers have on their children's substance use behaviors, potentially resulting in misleading conclusions about parental influences as a whole. The differential trends observed in our study—

protective effects from increased maternal communication versus risk-enhancing effects from increased paternal communication—suggest that the roles and impacts of mothers and fathers on college students' cannabis use are not interchangeable. Future research should therefore prioritize separating the analysis of maternal and paternal influences to uncover the specific dynamics of how each parent's communication style and frequency affect their child's substance use. Doing so will allow researchers to better identify and understand the nuanced mechanisms through which parental behavior influences college students' decisions about cannabis use. This distinction is crucial for developing more effective, tailored interventions that consider the unique contributions of each parent to their child's adjustment to college life and decision-making processes regarding substance use.

This study builds upon the existing body of research surrounding the FITSTART+ PBI by shedding light on its potential to prevent simultaneous alcohol and cannabis use during the first year of college. While prior studies have provided initial support for the program as a strategy to prevent heavy drinking (LaBrie et al., 2022, 2024), the current findings suggest an extension of these benefits to reducing concurrent substance use. However, the intervention does not appear to predict changes in parent-student communication through text or phone. This extension of the intervention's impact is consistent with the notion that reducing parental permissiveness toward drinking—a primary focus of FISTART+—may indirectly influence simultaneous substance use, as has been suggested in previous research (Trager et al., 2021). Consequently, these findings lend additional support to the idea that PBIs, which target alcohol-specific parenting constructs, can also have a meaningful effect on limiting the simultaneous use of alcohol and cannabis. Further, the study indicates that while FITSTART+ is tailored towards modifying alcohol-related behaviors, it neither affects cannabis use independently—as observed with some alcohol-specific PBIs (Grossbard et al., 2010)—nor does it have any significant effects on changes in parent-student communications via text or phone during the transition into college. It is crucial to acknowledge that these results are preliminary, and more research is needed to fully understand the effectiveness and scope of FITSTART+ before making any broad recommendations for its use in preventing substance use among college students.

Finally, results from this study also support previous findings on the reliability of certain predictors for cannabis use. This includes cannabis use being positively associated with past cannabis and alcohol use, and negatively associated with being White (Goodwin & Silverman, 2024; Hasin et al., 2019). These effects, along with the prevalence of cannabis use in this study (~38%) being greater than the national average (~24%; Schulenberg et al., 2021) offer some support for the notion that the findings from this study are likely to generalize beyond the current sample. However, future studies are needed to verify the current findings given that this study was conducted with underage students in a state where cannabis is legal for individuals who are 21 years of age and older.

Limitations and Future Directions

The findings of our study are subject to several limitations. First, the sample originated from a single university within a state where recreational cannabis use is permitted, which may restrict the applicability of our results across different contexts. Expanding this research to include a variety of universities and regions would likely broaden the relevance of our conclusions. Our study was also limited by its sample size. Given that cannabis use is endorsed by only about a quarter of college students (Schulenberg et al., 2021), large samples are needed to verify the current findings. Future work should investigate the observed associations in a large sample of individuals using cannabis and engaging in simultaneous use. Another limitation is the lack of baseline measurements of parent-student text and phone communication, with assessments of changes during the initial month of college relying on student-reported perceptions. While perceptions can significantly influence behavior (e.g., Trager et al., 2023b; Varvil-Weld et al., 2013), future studies should aim to corroborate these findings with objective measures of parent-student communication changes, such as actual counts of texts and calls, to align subjective experiences with tangible events. Another

limitation of this study was that we focused exclusively on communication with mothers and fathers, omitting other legal guardians/caregivers like aunts, uncles, or grandparents. Future investigations should encompass a broader spectrum of caregivers to capture the diverse family dynamics of students. The absence of consequences of cannabis or simultaneous use is another limitation. Incorporating a comprehensive view of how cannabis- and simultaneous use-related consequences correlate with parent-student communication changes in future research is essential for a more complete understanding of the influence of parental communication on risky behaviors.

Finally, this study was a secondary analysis of existing data, which inherently restricted our ability to incorporate other potentially relevant parent and student variables into our examination (e.g., parental closeness, content of parental communication, parental cannabis use, socioeconomic status, student mental health, peer influences). This limitation may have prevented a more comprehensive understanding of the effects under scrutiny. Future studies designed with the specific intent to explore these dynamics should aim to include a broader range of both parent and student variables that could influence the relationship between parent-student communication and cannabis use. Expanding the scope of investigation in this manner would likely yield a richer, more nuanced understanding of the factors contributing to cannabis use among college students, thereby enhancing the development of targeted interventions and policies.

Conclusion

To summarize, results from this study illustrate that increasing the frequency of calling with mothers and texting with fathers during the transition to college can be protective against cannabis use during the second semester of college. Conversely, increasing phone calls with fathers may predict greater risk of cannabis use during the same period. These findings reveal that encouraging parent communication via these modes of communication may be both beneficial and detrimental for cannabis use depending on the parent. Results also suggest that evaluating mothers and fathers separately can yield important insights that examining parents as a unit might not. Future research is needed to better understand the content and context of parent-student text and phone call communications, as well as how these interactions influence students' perceptions, attitudes, and behaviors towards cannabis use.

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