

ONLINE SUPPLEMENTAL MATERIALS

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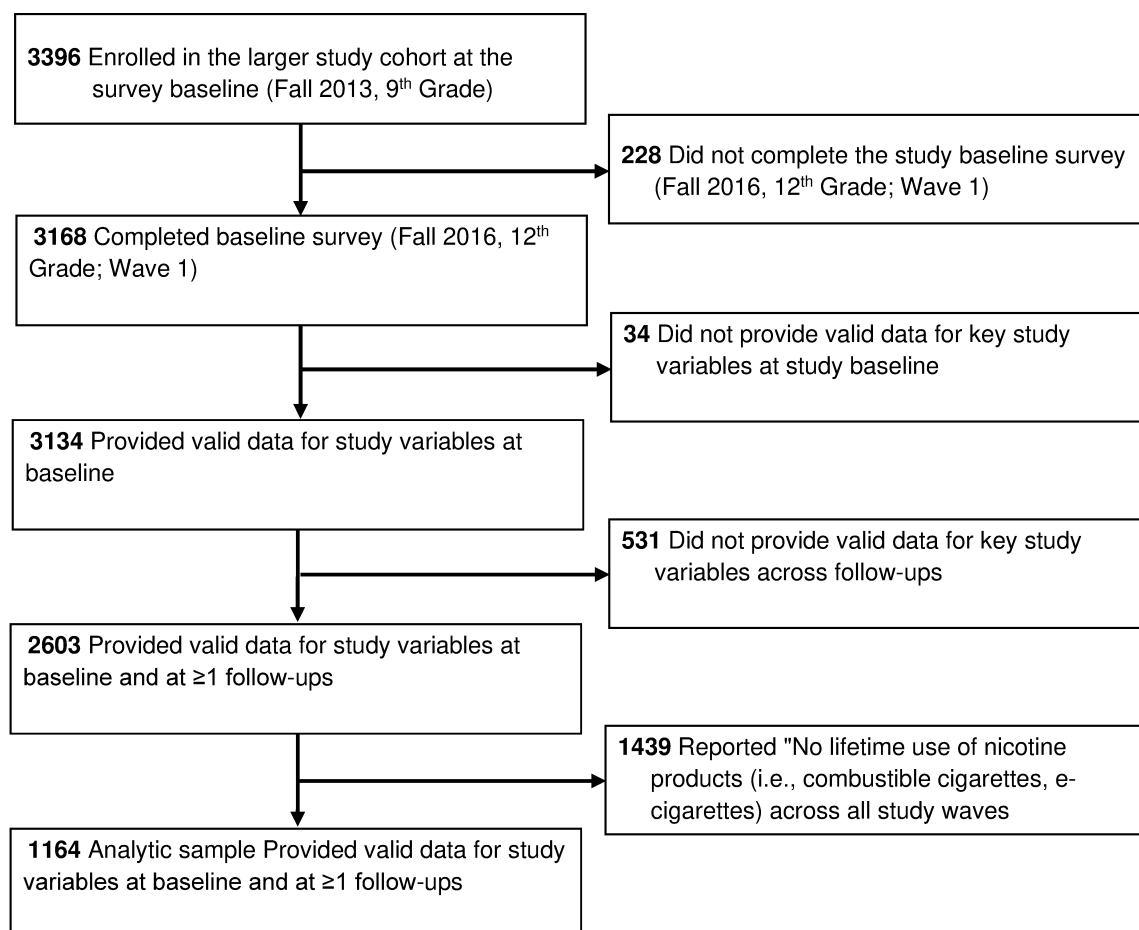
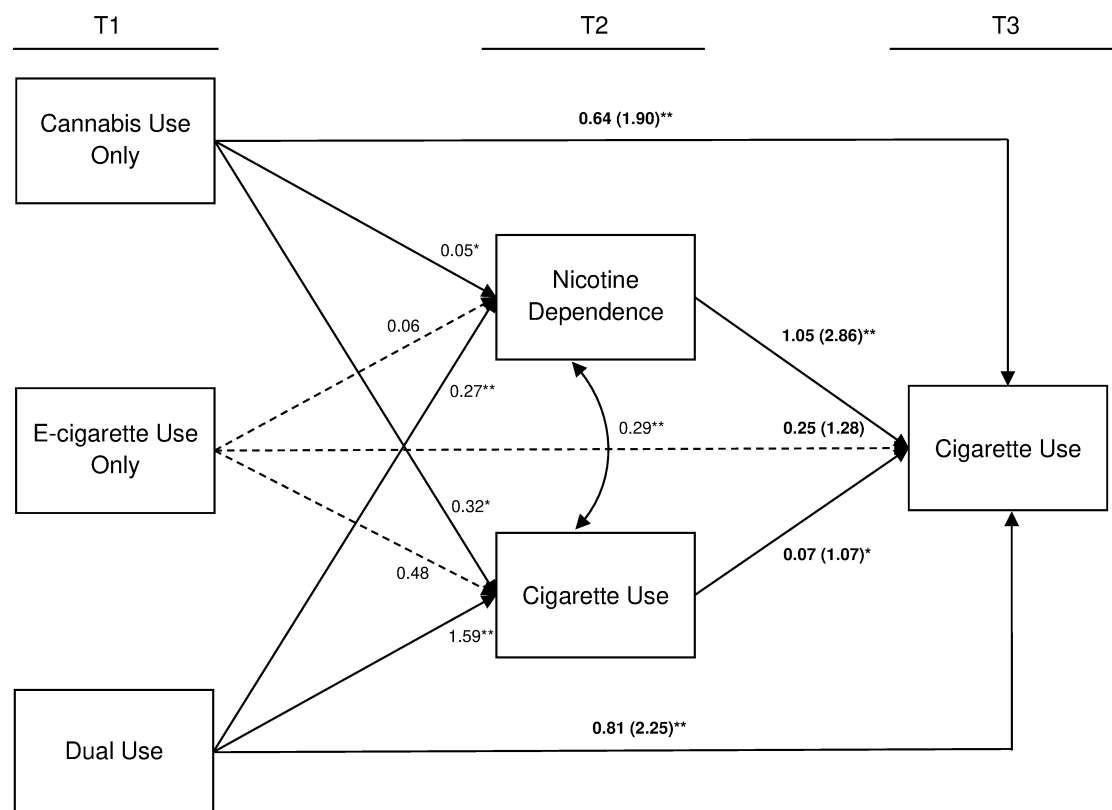
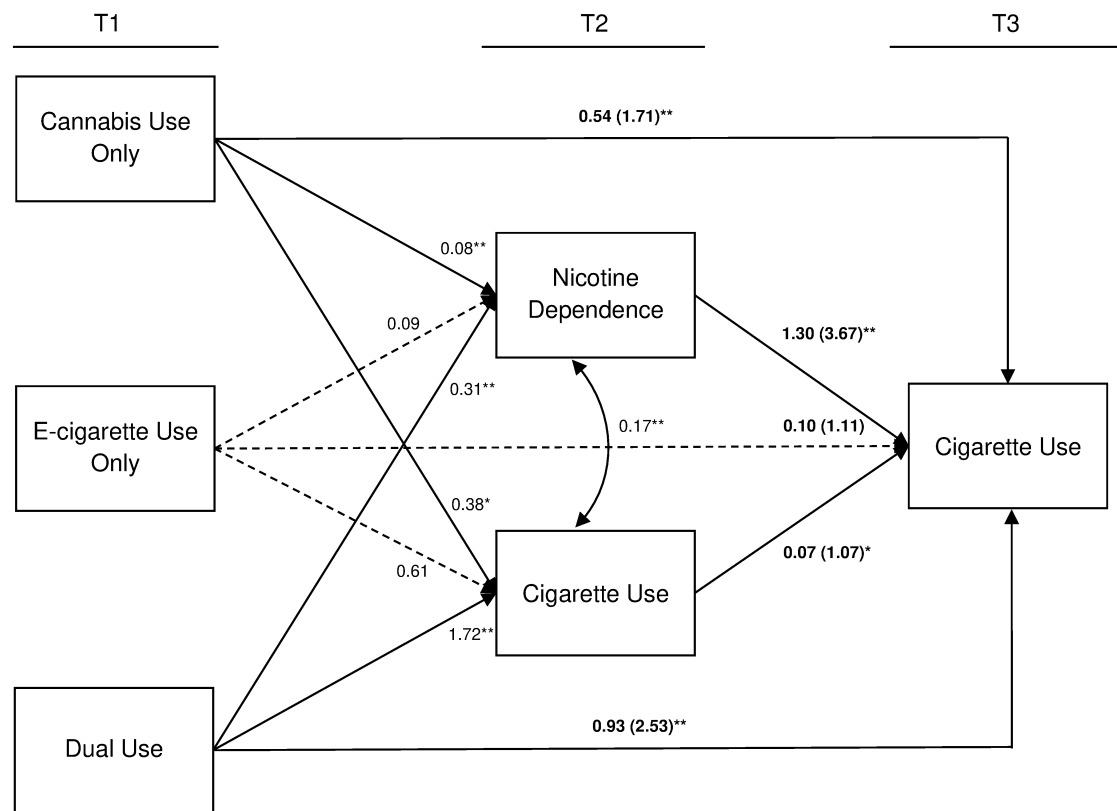
Figure S1. Study accrual flow chart

Figure S2. Primary mediational path analysis, restricted to past 30-day cigarette nonusers at baseline^a

^aAnalytic sample N = 1057 (Baseline past 30-day cigarette nonusers; 91.3% of primary analytic sample). Negative binomial regression model in path analysis adjusting for all covariates (e.g., age, gender, race/ethnicity) presented in Table 1 and past-co day use of other tobacco products. Reference group of dual cannabis and e-cigarette use status at T1 was 'No use'. Estimates on pathways linking T1 to T2 were unstandardized regression coefficients (bs). Estimates on pathways (bold text) linking T1/T2 to T3 were unstandardized regression coefficients (bs) with rate ratios (RRs).

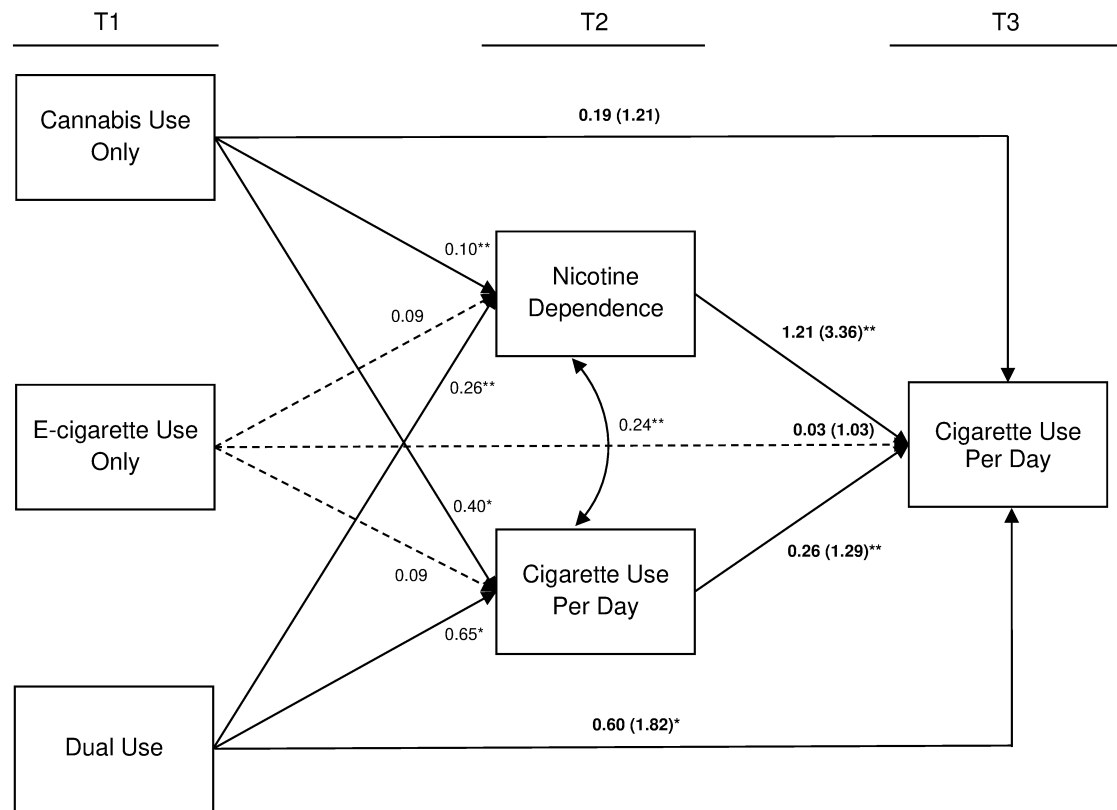
**p<.001; *p<.05 (two-tailed).

Figure S3. Primary mediational path analysis with the sample including lifetime non-users^a

^aAnalytic sample N = 2603 (Participants who provided valid data of study variables at baseline and at ≥ 1 follow-ups). Negative binomial regression model in path analysis adjusting for all covariates (e.g., age, gender, race/ethnicity) presented in Table 1. Reference group of dual cannabis and e-cigarette use status at T1 was 'No use'. Estimates on pathways linking T1 to T2 were unstandardized regression coefficients (bs). Estimates on pathways (bold text) linking T1/T2 to T3 were unstandardized regression coefficients (bs) with rate ratios (RRs).

**p<.001; *p<.05 (two-tailed).

Figure S4. Primary mediational path analysis using an alternative outcome of cigarette use quantity per day^a



^aAnalytic sample N = 1164. Cigarette use per day outcome (i.e., number of cigarettes smoked per smoking day; range=0-20). Negative binomial regression model in path analysis adjusting for all sociodemographic factors (e.g., age, gender, race/ethnicity, and socioeconomic status) and baseline cigarette use frequency per day in the past 30 days or other tobacco products and nicotine dependence) presented in Table 1. Reference group of dual cannabis and e-cigarette use status at T1 was 'No use'. Estimates on pathways linking T1 to T2 were unstandardized regression coefficients (bs). Estimates on pathways (bold text) linking T1/T2 to T3 were unstandardized regression coefficients (bs) with rate ratios (RRs).

**p<.001; *p<.05 (two-tailed).

Table S1. Sociodemographics of participants included in (vs. excluded from) the primary analytic sample^a

Sociodemographics	Analytic sample Provided valid data for study variables at baseline and at ≥ 1 follow-ups (N=1164) ^b	Excluded from the analysis (N=2232) ^c	Reported "No use of nicotine products (i.e., combustible cigarettes, e-cigarettes) across all study waves (N=1439) ^d
Female gender (vs. Male), N (%)	655 (56.3)	1158 (51.9)*	845 (58.7)
Age, M (SD), year	17.49 (0.41)	17.50 (0.41)	17.45 (0.38)
Race/ethnicity, N (%)			
Hispanic	609 (53.6)	996 (45.5)**	607 (42.7)**
Asian	127 (11.2)	433 (19.8)**	339 (23.8)**
African American	46 (4.0)	120 (5.5)	69 (4.8)
Non-Hispanic White	191 (16.8)	353 (16.1)	236 (16.6)
Other ^e	163 (14.3)	288 (13.2)	172 (12.1)
Parents graduated college (vs. less education), N (%) ^f	446 (43.7)	1036 (54.2)**	752 (59.4)**

^aN=3396; Participants enrolled in the parent study cohort in 9th grade of fall 2013 during high school.

^bAvailable data (Ns=1021-1164).

^cAvailable data (Ns=1910-2232).

^dAvailable data (Ns=1265-1439).

^eOther: 'American Indian/Alaskan Native', 'Native Hawaiian/Pacific Islander', or 'Multiethnic/Multiracial'.

^fParticipants who marked 'don't know' response (N=465) recoded as missing

**p<.001; *p<.05 (two-tailed). Calculated using one-way Analysis of Variance (ANOVA) for continuous variables and χ^2 test for categorical variables (Reference = Analytic sample).

Table S2: Distribution of e-cigarette and cannabis use at study baseline

Past 30-day use at baseline	Total analytic sample (N=1164)		Any e-cigarette or cannabis users (N=419)	
	E-cigarette use n(%)	Cannabis use n(%)	E-cigarette use n(%)	Cannabis use n(%)
0 days	1049 (90.1)	774 (66.5)	304 (72.6)	29 (6.9)
1-2 days	53 (4.6)	156 (13.4)	53 (12.6)	156 (37.2)
3-5 days	27 (2.3)	57 (4.9)	27 (6.4)	57 (13.6)
6-9 days	6 (0.5)	43 (3.7)	6 (1.4)	43 (10.3)
10-19 days	9 (0.8)	55 (4.7)	9 (2.1)	55 (13.1)
20-29 days	8 (0.7)	41 (3.5)	8 (1.9)	41 (9.8)
All 30 days	12 (1.0)	38 (3.3)	12 (2.9)	38 (9.1)

Table S3. Mediation pathways linking e-cigarette and cannabis use (T1) to cigarette use (T3) via cigarette use and nicotine dependence (T2)^a

	Total Effect Model ^b		Mediation Path Model ^b				
	Dual use status T1 → Cigarette use T3 ^d		Dual use status T1 → Cigarette use T3 ^d	Dual use status T1 → Cigarette use T2 ^e	Dual use status T1 → Nicotine dependence T2 ^e	Cigarette use T2 → Cigarette use T3 ^d	Nicotine dependence T2 → Cigarette use T3 ^d
Dual use status T1 ^c	RR (95%CI)		RR (95%CI)	b (95%CI)	b (95%CI)	RR (95%CI)	RR (95%CI)
No use	REF		REF	REF	REF		
Cannabis use only	2.58 (1.43, 4.98)		2.28 (1.33, 3.88)	0.38 (0.18, 0.57)	0.08 (0.05, 0.11)	1.07 (1.02, 1.13)	3.67 (2.32, 6.01)
E-cigarette use only	2.61 (1.04, 13.07)		2.19 (0.98, 11.72)	0.49 (-0.04, 1.05)	0.11 (-0.02, 0.25)		
Dual use	5.84 (3.16, 12.81)		3.51 (1.12, 10.01)	1.50 (0.97, 2.03)	0.31 (0.19, 0.43)		

^aAnalytic sample N = 1164.

^bNegative binomial regression model in path analysis adjusting for sociodemographic factors (age, gender, race/ethnicity, and socio-economic status) and baseline past 30-day cigarette or other tobacco product use and nicotine dependence) presented in Table 1.

^cReference group of dual cannabis and e-cigarette use status at T1 was 'No use'.

^dEstimates on pathways linking T1/T2 to T3 were rate ratio (RR) with 95% confidence interval (95%CI).

^eEstimates on pathways linking T1 to T2 were unstandardized regression coefficients (b) with 95%CIs.

Table S4: Prevalence of past 30-day any combustible cigarette use by e-cigarette and cannabis dual use status^a

Any smoking (1+ days) in the past 30 days	No use (N=754)	Cannabis use only (N=304)	E-cigarette use only (N=29)	Dual use (N=86)
	n (%)	n (%)	n (%)	n (%)
Cigarette use T1	23 (3.1)	45 (15.0)	4 (13.8)	29 (34.1)
Cigarette use T2	53 (7.4)	50 (17.2)	6 (21.4)	27 (32.9)
Cigarette use T3	58 (8.8)	34 (13.1)	4 (15.4)	21 (31.4)

^aAnalytic sample N = 1164.

Table S5: Mode of Cannabis use at study baseline (T1) among past 30-day cannabis users^a

Past 30-day cannabis use	N	%
Any cannabis use		
Combustible	362	92.8
Blunts	269	69.0
Vaped	126	32.3
Dabbing	121	31.0
Edible	182	46.7
Inhalation vs. Oral products		0.0
Inhalation only ^b	202	51.8
Oral only ^c	15	3.8
Both	167	42.8

N=1164. ^aAmong past 30-day any cannabis product users (Denominator N = 390). ^bIncludes combustible, blunts, vaped, and dabbing products. ^cIncludes edible product.