Supplemental Table 1. Overall effect of blood Δ^9-tetrahydrocannabinol (THC) concentration (µg/L), breath alcohol concentration (BrAC, g/210L), time, and interactions (THC*BrAC, time*THC, time*BrAC, time*THC*BrAC) on subjective effects in 19 healthy, occasional-to-moderate cannabis smokers following controlled vaporized cannabis administration with and without oral alcohol.

Parameter	b	SE_b	df	t	p	95% Confidence Interval of b	
						Lower Bound	Upper Bound
Likert Feel Hungry							
Intercept	0.435	0.197	32.9	2.2	**0.035**	0.034	0.836
Blood THC			406.9	-1.6	0.103		
BrAC			433.4	0.1	0.902		
Time	0.473	0.046	433.9	10.4	**<0.001**	0.384	0.563
THC*BrAC			433.2	0.9	0.379		
Time*THC			445.2	1.3	0.210		
Time*BrAC			433.5	-0.3	0.753		
Time*THC*BrAC			433.8	0.4	0.659		
Likert Shakiness/Tremulousness							
Intercept	0.072	0.036	140.9	2.0	**0.044**	0.002	0.143
Blood THC	0.004	0.002	18.5	2.5	**0.023**	0.001	0.008
BrAC			547.2	-0.4	0.682		
Time	-0.016	0.008	547.6	-2.1	**0.037**	-0.031	-0.001
THC*BrAC			549.4	0.2	0.805		
Time*THC			550.2	1.5	0.129		
Time*BrAC			546.4	1.6	0.114		
Time*THC*BrAC			545.4	-0.2	0.846		
Likert Nausea							
Intercept	0.116	0.043	36.2	2.7	**0.010**	0.030	0.202
Blood THC	-0.002	0.001	666.0	-2.2	**0.031**	-0.004	0.000
BrAC			657.0	-1.4	0.151		
Time	-0.019	0.004	657.4	-4.2	**<0.001**	-0.028	-0.010
THC*BrAC			658.6	0.9	0.369		
Time*THC	0.005	0.002	623.2	2.5	**0.011**	0.001	0.008
Time*BrAC			656.6	1.8	0.067		
Time*THC*BrAC			659.2	-0.8	0.396		
Likert Headache							
Intercept	0.172	0.057	42.4	3.0	**0.004**	0.057	0.286
Blood THC			191.2	-1.6	0.110		
BrAC	-2.438	1.224	659.1	-2.0	**0.047**	-4.841	-0.035
Time			659.4	-0.7	0.471		
THC*BrAC			661.2	0.0	0.964		
Time*THC			618.3	-0.3	0.782		
Time*BrAC			658.8	-0.1	0.891		
Time*THC*BrAC			659.4	1.1	0.251		
Likert Palpitations							
Intercept			539.2	0.4	0.657		
Blood THC			0.93	1.6	0.377		
BrAC			654.8	0.4	0.698		
Time			654.9	-0.4	0.662		
THC*BrAC			654.4	-1.3	0.207		

	b	SE	df	t	p		
Time*THC			654.5	0.0	0.981		
Time*BrAC			654.8	-0.3	0.728		
Time*THC*BrAC			654.4	1.6	0.115		
Likert Upset Stomach							
Intercept			48.6	2.0	0.057		
Blood THC			140.9	-0.5	0.637		
BrAC			657.4	-0.8	0.400		
Time	-0.008	0.004	656.8	-2.3	**0.019**	-0.015	-0.001
THC*BrAC			658.3	0.4	0.692		
Time*THC			671.3	1.4	0.153		
Time*BrAC			656.6	0.9	0.365		
Time*THC*BrAC			657.6	0.4	0.712		

Data from 19 occasional-to-moderate cannabis smokers who participated in all dosing sessions. Subjective effects were measured by 100 mm visual-analogue scales (VAS) or 5-point Likert scales (Likert) with choices 0≡"none", 1≡"slight", 2≡"mild", 3≡"moderate", 4≡"severe" after drinking placebo or active alcohol (calculated to produce approximate peak 0.065% BrAC) and inhaling placebo, 2.9% THC, or 6.7% THC vaporized cannabis (500 mg, Volcano® Medic vaporizer).

Linear mixed model results; b is parameter (coefficient) estimate for each factor (negative b indicates the parameter decreases the subjective effect; positive b indicates the parameter increases the overall effect).

Overall equation: [Subjective Effect Result] = Intercept $+ b_{Blood\ THC}*[THC]_{blood} + b_{BrAC}*BrAC + b_{Time}*$post-dose time $+ b_{THC*BrAC}*[THC]_{blood}*BrAC + b_{Time*THC}*$post-dose time$*[THC]_{blood} + b_{Time*BrAC}*$post-dose time$*BrAC + b_{Time*THC*BrAC}*$post-dose time$*[THC]_{blood}*BrAC$

[a]Values in **bold** are statistically significant ($p<0.05$); only significant predictors are considered in the final model.
Abbreviations: SE, standard error; df, degrees of freedom; VAS, visual-analogue scale; THC, Δ^9-tetrahydrocannabinol; BrAC, breath alcohol concentration.

Supplemental Table 2. Overall effect of oral fluid (OF) Δ^9-tetrahydrocannabinol (THC) concentration (μg/L), breath alcohol concentration (BrAC, g/210L), time, and interactions (THC*BrAC, time*THC, time*BrAC, time*THC*BrAC) on subjective effects beginning 1.4h post-dose in 19 occasional-to-moderate cannabis smokers following controlled vaporized cannabis administration with and without oral alcohol.

Parameter	b	SE_b	df	t	p^a	95% Confidence Interval of b	
						Lower Bound	Upper Bound
VAS Anxious							
Intercept	5.332	1.102	58.09	4.84	**<0.001**	3.127	7.537
OF THC	0.045	0.014	11.06	3.32	**0.007**	0.015	0.075
BrAC			869.16	1.50	0.133		
Time	-0.370	0.128	866.25	-2.88	**0.004**	-0.621	-0.118
THC*BrAC			861.97	-1.17	0.244		
Time*THC			821.08	-0.15	0.884		
Time*BrAC			869.48	0.25	0.805		
Time*THC*BrAC			852.98	-0.78	0.433		
Subject Variance in Intercepts (THC)	11.928	4.245			**0.005**	5.938	23.960
Subject variance in Slopes (THC)					0.176		
ARH1 rho (slope-intercept covariance)	0.682	0.174			**<0.000**	0.191	0.900
VAS Good Drug Effect							
Intercept	16.427	1.904	52.38	8.63	**<0.001**	12.608	20.247
OF THC	0.222	0.057	7.31	3.92	**0.005**	0.089	0.354
BrAC	376.67	68.01	869.93	5.54	**<0.001**	243.18	510.15
Time	-2.081	0.213	864.72	-9.75	**<0.001**	-2.500	-1.662
THC*BrAC	-0.698	0.299	860.75	-2.33	**0.020**	-1.285	-0.111
Time*THC			820.97	-0.32	0.749		
Time*BrAC	-75.40	29.06	853.06	-2.59	**0.010**	-132.44	-18.35
Time*THC*BrAC	-0.129	0.177	861.05	-0.73	0.468	-0.477	0.219
Subject Variance in Intercepts (THC)	37.956	13.375			**0.005**	19.03	75.73
Subject variance in Slopes (THC)					0.082		
ARH1 rho (slope-intercept covariance)	0.805	0.128			**<0.001**	0.381	0.950
VAS High							
Intercept	15.33	1.80	59.87	8.53	**<0.001**	11.73	18.92
OF THC	0.373	0.117	10.50	3.20	**0.009**	0.115	0.632
BrAC	296.40	66.95	854.38	4.43	**0.000**	164.99	427.81
Time	-1.994	0.211	860.70	-9.47	**0.000**	-2.407	-1.581
THC*BrAC	-0.583	0.295	858.67	-1.98	**0.048**	-1.162	-0.004
Time*THC			862.55	-0.55	0.580		
Time*BrAC	-65.08	28.50	849.15	-2.28	**0.023**	-121.02	-9.15
Time*THC*BrAC			866.18	-0.26	0.794		
Subject Variance in Intercepts (THC)	31.076	11.110			**0.005**	15.421	62.622
Subject variance in Slopes (THC)	0.242	0.111			**0.030**	0.098	0.597
ARH1 rho (slope-intercept covariance)	0.555	0.186			**0.003**	0.099	0.819
VAS Restless							
Intercept	10.97	2.36	41.71	4.65	**<0.001**	6.21	15.73
OF THC			93.04	1.84	0.069		
BrAC			810.57	-0.29	0.770		
Time			869.52	0.16	0.871		
THC*BrAC			819.76	-0.73	0.467		

	Estimate	SE	df	t	p	Lower	Upper
Time*THC			887.55	-0.38	0.704		
Time*BrAC			872.48	0.57	0.566		
Time*THC*BrAC			875.57	0.03	0.977		
Subject Variance in Intercepts (THC)	67.08	23.06			**0.004**	34.20	131.59
Subject variance in Slopes (THC)					0.311		
ARH1 rho (slope-intercept covariance)					0.541		

VAS Sedated

	Estimate	SE	df	t	p	Lower	Upper
Intercept	17.21	3.08	29.43	5.60	**<0.001**	10.92	23.50
OF THC			59.47	0.57	0.570		
BrAC			830.58	0.63	0.528		
Time	-1.26	0.24	875.41	-5.16	**<0.001**	-1.73	-0.78
THC*BrAC			831.80	0.48	0.631		
Time*THC			886.81	0.58	0.563		
Time*BrAC			877.81	0.71	0.478		
Time*THC*BrAC			882.50	-1.75	0.081		
Subject Variance in Intercepts (THC)	140.12	46.80			**0.003**	72.81	269.65
Subject variance in Slopes (THC)					0.333		
ARH1 rho (slope-intercept covariance)	-0.699	0.222			**0.002**	-0.938	-0.015

VAS Stimulated

	Estimate	SE	df	t	p	Lower	Upper
Intercept	16.37	2.05	37.02	7.97	**<0.001**	12.21	20.53
OF THC	0.219	0.075	5.10	2.93	**0.032**	0.028	0.411
BrAC	222.54	61.77	840.77	3.60	**0.000**	101.29	343.79
Time	-1.799	0.194	855.59	-9.27	**<0.001**	-2.180	-1.418
THC*BrAC			824.85	-1.53	0.126		
Time*THC			840.19	0.19	0.853		
Time*BrAC			827.69	-1.92	0.055		
Time*THC*BrAC			833.83	-1.26	0.209		
Subject Variance in Intercepts (THC)	54.51	18.57			**0.003**	27.96	106.28
Subject variance in Slopes (THC)					0.141		
ARH1 rho (slope-intercept covariance)	0.564	0.176			**0.001**	0.133	0.816

VAS Stoned

	Estimate	SE	df	t	p	Lower	Upper
Intercept	14.67	2.21	39.74	6.63	**<0.001**	10.20	19.13
OF THC	0.280	0.093	6.46	3.01	**0.022**	0.057	0.503
BrAC	283.22	69.37	841.69	4.08	**<0.001**	147.05	419.38
Time	-1.740	0.217	853.57	-8.00	**<0.001**	-2.167	-1.314
THC*BrAC			833.62	-1.63	0.102		
Time*THC			844.07	-0.80	0.426		
Time*BrAC	-76.84	29.67	834.59	-2.59	**0.010**	-135.07	-18.60
Time*THC*BrAC			839.33	-0.68	0.499		
Subject Variance in Intercepts (THC)	60.63	20.77			**0.004**	30.98	118.67
Subject variance in Slopes (THC)					0.100		
ARH1 rho (slope-intercept covariance)					0.615		

Likert Difficulty Concentrating

	Estimate	SE	df	t	p	Lower	Upper
Intercept	0.514	0.092	32.69	5.57	**<0.001**	0.326	0.702
OF THC			6.91	2.12	0.072		
BrAC	7.86	2.55	876.67	3.08	**0.002**	2.86	12.87
Time	-0.052	0.008	870.90	-6.46	**<0.001**	-0.067	-0.036
THC*BrAC			850.03	0.48	0.632		
Time*THC			857.74	0.79	0.432		

	Estimate	SE	df	t	p	Lower	Upper
Time*BrAC			863.12	-1.88	0.061		
Time*THC*BrAC			852.98	-0.40	0.693		
Subject Variance in Intercepts (THC)	0.119	0.040			**0.003**	0.061	0.230
Subject variance in Slopes (THC)					0.147		
ARH1 rho (slope-intercept covariance)	0.549	0.178			**0.002**	0.116	0.807
Likert Altered Sense of Time							
Intercept	0.334	0.071	49.98	4.68	**<0.001**	0.191	0.478
OF THC	0.005	0.002	12.06	2.35	**0.037**	0.000	0.010
BrAC	5.605	2.503	881.85	2.24	**0.025**	0.693	10.517
Time	-0.044	0.008	874.51	-5.56	**<0.001**	-0.059	-0.028
THC*BrAC			875.97	-1.03	0.302		
Time*THC			719.54	0.24	0.807		
Time*BrAC			874.10	-0.95	0.343		
Time*THC*BrAC			839.79	-0.10	0.919		
Subject Variance in Intercepts (THC)	0.055	0.019			**0.004**	0.028	0.109
Subject variance in Slopes (THC)	0.000	0.000			**0.022**	0.000	0.000
ARH1 rho (slope-intercept covariance)	0.922	0.060			**<0.001**	0.674	0.983
Likert Slowed/Slurred Speech							
Intercept	0.141	0.045	85.37	3.14	**0.002**	0.052	0.230
OF THC			14.87	1.73	0.104		
BrAC	5.748	1.859	875.26	3.09	**0.002**	2.100	9.396
Time	-0.019	0.006	875.46	-3.25	**0.001**	-0.030	-0.008
THC*BrAC			874.56	1.18	0.239		
Time*THC			875.67	0.01	0.993		
Time*BrAC			874.96	-1.22	0.223		
Time*THC*BrAC			874.66	-1.45	0.147		
Subject Variance in Intercepts (THC)	0.015	0.006			**0.009**	0.007	0.032
Subject variance in Slopes (THC)	0.00014	0.00006			**0.021**	0.00006	0.00032
ARH1 rho (slope-intercept covariance)					--		
Likert Body Feels Sluggish/Heavy							
Intercept	0.574	0.091	48.11	6.32	**<0.001**	0.391	0.757
OF THC			11.29	1.71	0.115		
BrAC	7.502	3.152	881.42	2.38	**0.018**	1.316	13.687
Time	-0.058	0.010	874.12	-5.91	**<0.001**	-0.078	-0.039
THC*BrAC			873.41	-0.20	0.842		
Time*THC			875.71	1.32	0.188		
Time*BrAC			877.21	-0.60	0.546		
Time*THC*BrAC			867.94	-0.96	0.338		
Subject Variance in Intercepts (THC)	0.091	0.032			**0.004**	0.046	0.181
Subject variance in Slopes (THC)					0.225		
ARH1 rho (slope-intercept covariance)					0.386		
Likert Feel Thirsty							
Intercept	1.142	0.112	48.47	10.22	**<0.001**	0.918	1.367
OF THC	0.004	0.001	12.40	2.88	**0.013**	0.001	0.007
BrAC			880.91	-0.09	0.926		
Time	-0.128	0.012	875.64	-10.6	**<0.001**	-0.152	-0.104
THC*BrAC			878.53	0.55	0.581		
Time*THC	0.001	0.000	863.23	3.20	**0.001**	0.000	0.002
Time*BrAC	5.565	1.660	878.88	3.35	**0.001**	2.307	8.822

	Estimate	SE	df	t	p	Lower	Upper
Time*THC*BrAC	-0.024	0.010	873.11	-2.35	**0.019**	-0.044	-0.004
Subject Variance in Intercepts (THC)	0.138	0.048			**0.004**	0.069	0.272
Subject variance in Slopes (THC)					0.136		
ARH1 rho (slope-intercept covariance)	0.598	0.256			**0.020**	-0.092	0.900
Likert Dizzy							
Intercept	0.082	0.027	197.43	3.01	**0.003**	0.028	0.135
OF THC			15.59	1.43	0.174		
BrAC	4.408	1.277	864.60	3.45	**0.001**	1.902	6.914
Time	-0.009	0.004	863.05	-2.22	**0.027**	-0.017	-0.001
THC*BrAC			875.78	0.13	0.895		
Time*THC			782.83	-0.04	0.968		
Time*BrAC	-1.481	0.543	864.55	-2.73	**0.007**	-2.547	-0.415
Time*THC*BrAC			860.09	-0.18	0.857		
Subject Variance in Intercepts (THC)	0.003	0.001			**0.029**	0.001	0.007
Subject variance in Slopes (THC)	0.0003	0.0001			**0.007**	0.0001	0.0005
ARH1 rho (slope-intercept covariance)					0.509		
Likert Dry Mouth or Throat							
Intercept	0.727	0.093	71.08	7.83	**<0.001**	0.542	0.913
OF THC	0.013	0.005	9.79	2.54	**0.030**	0.002	0.024
BrAC			863.27	1.60	0.110		
Time	-0.084	0.011	868.02	-7.33	**<0.001**	-0.107	-0.062
THC*BrAC			864.66	0.47	0.637		
Time*THC	0.001	0.000	842.04	3.06	**0.002**	0.000	0.002
Time*BrAC			856.97	-0.54	0.591		
Time*THC*BrAC			865.39	-0.98	0.326		
Subject Variance in Intercepts (THC)	0.074	0.027			**0.006**	0.036	0.152
Subject variance in Slopes (THC)	0.000	0.000			**0.039**	0.000	0.001
ARH1 rho (slope-intercept covariance)	0.628	0.169			**0.000**	0.190	0.857
Likert Feel Hungry							
Intercept	1.771	0.123	57.82	14.41	**<0.001**	1.525	2.017
OF THC			896.47	-1.67	0.096		
BrAC	-14.84	4.41	882.70	-3.37	**0.001**	-23.49	-6.19
Time	-0.238	0.014	883.14	-16.6	**<0.001**	-0.266	-0.210
THC*BrAC			889.20	1.45	0.148		
Time*THC	0.001	0.000	899.57	2.83	**0.005**	0.000	0.002
Time*BrAC	9.144	1.944	884.02	4.70	**<0.001**	5.328	12.959
Time*THC*BrAC			895.64	-1.88	0.060		
Subject Variance in Intercepts (THC)	0.150	0.053			**0.005**	0.075	0.299
Subject variance in Slopes (THC)					0.479		
ARH1 rho (slope-intercept covariance)					--		
Likert Feel Shakiness/Tremulousness							
Intercept			810.68	1.66	0.097		
OF THC			0.27	1.37	0.650		
BrAC			879.36	-0.38	0.702		
Time			876.77	-1.45	0.149		
THC*BrAC			878.33	-1.88	0.061		
Time*THC			878.42	-0.48	0.628		
Time*BrAC			879.56	0.86	0.390		
Time*THC*BrAC	0.0059	0.0027	878.26	2.14	**0.033**	0.0005	0.0113

	Estimate	SE	df	t	p		
Subject Variance in Intercepts (THC)					0.721		
Subject variance in Slopes (THC)	0.000	0.000			**0.006**	0.000	0.000
ARH1 rho (slope-intercept covariance)					--		

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	Estimate	SE	df	t	p		
Intercept	0.126	0.032	93.30	3.88	**<0.001**	0.061	0.190
OF THC			251.26	1.01	0.315		
BrAC			886.90	-0.82	0.414		
Time	-0.017	0.004	884.95	-3.97	**<0.001**	-0.026	-0.009
THC*BrAC			891.21	-0.89	0.374		
Time*THC			896.37	-0.35	0.728		
Time*BrAC			886.58	0.54	0.591		
Time*THC*BrAC			890.11	1.04	0.299		
Subject Variance in Intercepts (THC)	0.007	0.003			**0.009**	0.004	0.016
Subject variance in Slopes (THC)	0.000	0.000			**0.040**	0.000	0.000
ARH1 rho (slope-intercept covariance)					--		

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	Estimate	SE	df	t	p		
Intercept	0.168	0.056	70.65	3.01	**0.004**	0.057	0.280
OF THC			892.32	-0.56	0.578		
BrAC			881.93	-1.38	0.169		
Time			882.26	-1.17	0.241		
THC*BrAC			892.35	-0.54	0.586		
Time*THC			898.44	0.85	0.393		
Time*BrAC			884.07	0.30	0.761		
Time*THC*BrAC			898.61	0.60	0.549		
Subject Variance in Intercepts (THC)	0.027	0.010			**0.006**	0.013	0.055
Subject variance in Slopes (THC)					0.923		
ARH1 rho (slope-intercept covariance)					--		

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	Estimate	SE	df	t	p		
Intercept	-0.012	0.005	411.13	-2.27	**0.024**	-0.022	-0.002
OF THC			7.33	1.52	0.171		
BrAC	0.819	0.268	887.10	3.06	**0.002**	0.294	1.345
Time	0.0018	0.0008	889.95	2.13	**0.034**	0.0001	0.0034
THC*BrAC			883.82	-1.17	0.243		
Time*THC			886.13	-1.31	0.192		
Time*BrAC	-0.255	0.114	885.69	-2.24	**0.025**	-0.478	-0.032
Time*THC*BrAC			884.81	-0.07	0.947		
Subject Variance in Intercepts (THC)					0.083		
Subject variance in Slopes (THC)	0.000	0.000			**0.004**	0.000	0.000
ARH1 rho (slope-intercept covariance)					--	.	.

<table>
<tr><td colspan="8" align="center">Likert Upset Stomach</td></tr>
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	Estimate	SE	df	t	p		
Intercept	0.061	0.021	173.16	2.95	**0.004**	0.020	0.102
OF THC			47.87	1.37	0.177		
BrAC			889.33	-0.61	0.540		
Time	-0.007	0.003	886.65	-2.42	**0.016**	-0.013	-0.001
THC*BrAC	-0.014	0.004	889.86	-3.41	**0.001**	-0.023	-0.006
Time*THC	-0.0002	0.0001	894.36	-1.97	**0.0497**	-0.0004	0.0000
Time*BrAC			888.49	0.17	0.868		
Time*THC*BrAC	0.010	0.002	888.86	4.05	**<0.001**	0.005	0.015
Subject Variance in Intercepts	0.002	0.001			**0.020**	0.001	0.004

(THC)						
Subject variance in Slopes (THC)	0.000	0.000		**0.010**	0.000	0.000
ARH1 rho (slope-intercept covariance)				--		

Data from 19 occasional-to-moderate cannabis smokers who participated in all dosing sessions, excluding times <1.4h post-dose. Subjective effects were measured by 100 mm visual-analogue scales (VAS) or 5-point Likert scales (Likert) with choices 0≡"none", 1≡"slight", 2≡"mild", 3≡"moderate", 4≡"severe" after drinking placebo or active alcohol (calculated to produce approximate peak 0.065% BrAC) and inhaling placebo, 2.9% THC, or 6.7% THC vaporized cannabis (500 mg, Volcano® Medic vaporizer).

Linear mixed model results; b is parameter (coefficient) estimate for each factor (negative b indicates the parameter decreases the subjective effect; positive b indicates the parameter increases the overall effect).

Overall equation: [Subjective Effect Result] = Intercept $+b_{OF\ THC}*[THC]_{blood} + b_{BrAC}*BrAC + b_{Time}*$post-dose time $+ b_{THC*BrAC}*[THC]_{OF}*BrAC + b_{Time*THC}*$post-dose time$*[THC]_{OF} + b_{Time*BrAC}*$post-dose time$*BrAC + b_{Time*THC*BrAC}*$post-dose time$*[THC]_{OF}*BrAC$

[a]Values in **bold** are statistically significant ($p<0.05$); only significant predictors are considered in the final model.

Abbreviations: SE, standard error; df, degrees of freedom; VAS, visual-analogue scale; THC, Δ^9-tetrahydrocannabinol; BrAC, breath alcohol concentration.

Supplemental Table 3. Overall effect of oral fluid (OF) Δ^9-tetrahydrocannabinol (THC) concentration (µg/L), breath alcohol concentration (BrAC, g/210L), time, and interactions (THC*BrAC, time*THC, time*BrAC, time*THC*BrAC) on subjective effects in 19 occasional-to-moderate cannabis smokers following controlled vaporized cannabis administration with and without oral alcohol.

Parameter	b	SE$_b$	df	t	p[a]	95% Confidence Interval of b	
						Lower Bound	Upper Bound
VAS Anxious							
Intercept	9.003	1.123	45.88	8.0	**<0.001**	6.742	11.264
OF THC			6.97	0.6	0.585		
BrAC			978.55	0.6	0.559		
Time	-0.965	0.125	970.53	-7.7	**<0.001**	-1.210	-0.719
THC*BrAC			942.52	1.0	0.322		
Time*THC	0.0063	0.0025	810.20	2.5	**0.011**	0.0014	0.0111
Time*BrAC			974.93	0.4	0.718		
Time*THC*BrAC	-0.103	0.050	876.28	-2.1	**0.037**	-0.201	-0.006
Subject Variance in Intercepts (THC)	13.890	4.984			**0.005**	6.875	28.062
Subject variance in Slopes (THC)					0.528		
ARH1 rho (slope-intercept covariance)	0.646	0.310			**0.037**	-0.268	0.948
VAS Good Drug Effect							
Intercept	24.610	2.114	36.63	11.6	**<0.001**	20.325	28.895
OF THC	0.0073	0.0026	10.54	2.8	**0.017**	0.0016	0.0130
BrAC	264.584	39.073	990.22	6.8	**<0.001**	187.909	341.259
Time	-3.401	0.208	987.76	-16.3	**<0.001**	-3.809	-2.992
THC*BrAC			977.73	0.4	0.687		
Time*THC	0.0182	0.0040	867.47	4.5	**<0.001**	0.0103	0.0260
Time*BrAC	-57.421	19.932	988.98	-2.9	**0.004**	-96.535	-18.306
Time*THC*BrAC	-0.230	0.077	937.40	-3.0	**0.003**	-0.380	-0.079
Subject Variance in Intercepts (THC)	56.978	19.796			**0.004**	28.838	112.576
Subject variance in Slopes (THC)					0.058	0.000	0.000
ARH1 rho (slope-intercept covariance)	0.830	0.142			**0.000**	0.285	0.970
VAS High							
Intercept	25.628	2.050	42.01	12.5	**<0.001**	21.491	29.765
OF THC	0.0115	0.0036	11.00	3.2	**0.008**	0.0037	0.0193
BrAC	195.297	40.951	991.81	4.8	**<0.001**	114.935	275.658
Time	-3.631	0.219	988.84	-16.6	**<0.001**	-4.060	-3.201
THC*BrAC			935.55	-0.5	0.620		
Time*THC	0.0187	0.0041	638.56	4.5	**<0.001**	0.0106	0.0268
Time*BrAC	-47.901	20.878	991.03	-2.3	**0.022**	-88.870	-6.931
Time*THC*BrAC	-0.196	0.079	787.41	-2.5	**0.013**	-0.351	-0.041
Subject Variance in Intercepts (THC)	49.024	17.353			**0.005**	24.497	98.108
Subject variance in Slopes (THC)	0.000	0.000			**0.037**	0.000	0.001
ARH1 rho (slope-intercept covariance)	0.923	0.070			**<0.001**	0.596	0.987
VAS Restless							
Intercept	12.717	2.121	33.43	6.0	**<0.001**	8.405	17.029
OF THC			55.54	0.0	0.982		

BrAC			977.92	-0.2	0.821		
Time			971.19	-1.3	0.181		
THC*BrAC			946.79	1.0	0.338		
Time*THC			994.51	1.4	0.173		
Time*BrAC			965.82	0.3	0.780		
Time*THC*BrAC			995.77	-1.1	0.266		
Subject Variance in Intercepts (THC)	60.781	20.866			**0.004**	31.014	119.120
Subject variance in Slopes (THC)					0.312		
ARH1 rho (slope-intercept covariance)					0.653		

VAS Sedated

Intercept	18.366	2.715	27.42	6.8	**<0.001**	12.799	23.933
OF THC			998.87	-1.4	0.174		
BrAC			990.41	0.4	0.659		
Time	-1.448	0.208	990.22	-7.0	**<0.001**	-1.856	-1.041
THC*BrAC			994.46	1.3	0.197		
Time*THC	0.0087	0.0041	1003.97	2.1	**0.037**	0.0005	0.0168
Time*BrAC			990.19	1.3	0.209		
Time*THC*BrAC	-0.159	0.079	1000.95	-2.0	**0.044**	-0.313	-0.004
Subject Variance in Intercepts (THC)	18.366	2.715			**0.003**	12.799	23.933
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

VAS Stimulated

Intercept	23.298	2.282	29.53	10.2	**<0.001**	18.634	27.962
OF THC			3.50	1.5	0.221		
BrAC	226.775	35.601	945.07	6.4	**<0.001**	156.910	296.641
Time	-2.930	0.188	978.90	-15.6	**<0.001**	-3.299	-2.561
THC*BrAC	0.044	0.016	953.00	2.7	**0.006**	0.012	0.076
Time*THC	0.0213	0.0036	936.20	5.9	**<0.001**	0.0142	0.0285
Time*BrAC	-77.518	18.029	950.94	-4.3	**<0.001**	-112.898	-42.137
Time*THC*BrAC	-0.324	0.069	936.73	-4.7	**<0.001**	-0.460	-0.187
Subject Variance in Intercepts (THC)	76.099	25.727			**0.003**	39.229	147.622
Subject variance in Slopes (THC)					0.245		
ARH1 rho (slope-intercept covariance)	0.628	0.162			**<0.001**	0.211	0.851

VAS Stoned

Intercept	23.581	2.219	36.32	10.6	**<0.001**	19.081	28.081
OF THC			8.10	1.1	0.300		
BrAC	159.548	40.963	979.29	3.9	**<0.001**	79.163	239.933
Time	-3.178	0.218	984.66	-14.6	**<0.001**	-3.605	-2.751
THC*BrAC			976.63	0.0	0.987		
Time*THC	0.0166	0.0042	975.54	3.9	**<0.001**	0.0083	0.0250
Time*BrAC	-55.741	20.971	978.65	-2.7	**0.008**	-96.895	-14.586
Time*THC*BrAC	-0.212	0.081	974.10	-2.6	**0.009**	-0.370	-0.053
Subject Variance in Intercepts (THC)	63.059	21.915			**0.004**	31.909	124.615
Subject variance in Slopes (THC)					0.097		
ARH1 rho (slope-intercept covariance)					0.249		

Likert Difficulty Concentrating

	Estimate	SE	df	t	p	Lower	Upper
Intercept	0.594	0.097	27.13	6.1	**<0.001**	0.394	0.794
OF THC			8.39	1.5	0.161		
BrAC	7.252	1.376	989.34	5.3	**<0.001**	4.552	9.953
Time	-0.064	0.007	991.00	-8.8	**<0.001**	-0.078	-0.050
THC*BrAC			989.10	0.1	0.885		
Time*THC	0.0003	0.0001	981.98	2.1	**0.034**	0.0000	0.0006
Time*BrAC	-1.560	0.701	988.02	-2.2	**0.026**	-2.937	-0.184
Time*THC*BrAC	-0.006	0.003	980.15	-2.2	**0.025**	-0.011	-0.001
Subject Variance in Intercepts (THC)	0.146	0.049			**0.003**	0.076	0.281
Subject variance in Slopes (THC)					0.087		
ARH1 rho (slope-intercept covariance)	0.659	0.155			**<0.001**	0.247	0.869

Likert Altered Sense of Time

	Estimate	SE	df	t	p	Lower	Upper
Intercept	0.473	0.084	32.21	5.6	**<0.001**	0.301	0.645
OF THC			10.37	1.8	0.102		
BrAC	3.087	1.421	995.32	2.2	**0.030**	0.297	5.876
Time	-0.066	0.008	995.52	-8.7	**<0.001**	-0.081	-0.051
THC*BrAC			921.42	0.8	0.444		
Time*THC	0.0004	0.0001	524.49	2.6	**0.008**	0.0001	0.0006
Time*BrAC			995.25	0.1	0.886		
Time*THC*BrAC	-0.007	0.003	688.97	-2.6	**0.010**	-0.012	-0.002
Subject Variance in Intercepts (THC)	0.098	0.034			**0.003**	0.050	0.192
Subject variance in Slopes (THC)	0.000	0.000			**0.034**	0.000	0.000
ARH1 rho (slope-intercept covariance)	0.981	0.024			**<0.001**	0.776	0.999

Likert Slowed/Slurred Speech

	Estimate	SE	df	t	p	Lower	Upper
Intercept	0.268	0.056	38.18	4.8	**<0.001**	0.154	0.382
OF THC			18.85	1.8	0.091		
BrAC	2.907	1.065	989.38	2.7	**0.006**	0.816	4.997
Time	-0.038	0.006	990.28	-6.7	**<0.001**	-0.049	-0.027
THC*BrAC			990.31	-0.8	0.430		
Time*THC			992.84	0.2	0.803		
Time*BrAC			989.37	-0.1	0.904		
Time*THC*BrAC			991.08	0.5	0.604		
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

Likert Body Feels Sluggish/Heavy

	Estimate	SE	df	t	p	Lower	Upper
Intercept	0.677	0.089	33.81	7.6	**<0.001**	0.496	0.858
OF THC	-0.0001	0.0000	958.74	-3.4	**0.001**	-0.0002	0.0000
BrAC	6.043	1.595	998.29	3.8	**<0.001**	2.912	9.174
Time	-0.075	0.008	996.81	-9.0	**<0.001**	-0.092	-0.059
THC*BrAC	0.002	0.001	1007.01	3.0	**0.003**	0.001	0.004
Time*THC	0.0007	0.0002	1014.76	4.0	**<0.001**	0.0003	0.0010
Time*BrAC			998.17	-0.7	0.503		
Time*THC*BrAC	-0.011	0.003	1012.50	-3.4	**0.001**	-0.017	-0.005
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		

ARH1 rho (slope-intercept covariance)			--	--	--		

Likert Feel Thirsty

Intercept	1.036	0.132	82.86	7.9	**<0.001**	0.773	1.298
OF THC	-0.0002	0.0001	25.13	-3.0	**0.006**	-0.00032	-0.00006
BrAC			434.92	-0.7	0.455		
Time			437.45	0.2	0.803		
THC*BrAC	0.005	0.001	411.88	4.2	**<0.001**	0.003	0.007
Time*THC	0.0015	0.0003	407.93	5.4	**<0.001**	0.0010	0.0021
Time*BrAC	5.808	1.648	430.90	3.5	**<0.001**	2.569	9.048
Time*THC*BrAC	-0.023	0.005	428.57	-4.3	**<0.001**	-0.034	-0.013
Subject Variance in Intercepts (THC)	0.122	0.050			**0.014**	0.055	0.271
Subject variance in Slopes (THC)					0.299		
ARH1 rho (slope-intercept covariance)					0.581		

Likert Dizzy

Intercept	0.180	0.032	77.56	5.6	**<0.001**	0.117	0.244
OF THC			15.89	1.3	0.208		
BrAC			976.30	0.1	0.895		
Time	-0.024	0.004	977.01	-5.7	**<0.001**	-0.032	-0.016
THC*BrAC			991.05	-0.6	0.522		
Time*THC			925.95	-0.6	0.517		
Time*BrAC			979.24	-0.4	0.659		
Time*THC*BrAC			969.93	0.9	0.353		
Subject Variance in Intercepts (THC)	0.008	0.003			**0.009**	0.004	0.017
Subject variance in Slopes (THC)	0.000	0.000			**0.005**	0.000	0.000
ARH1 rho (slope-intercept covariance)	0.478	0.210			**0.023**	-0.013	0.783

Likert Dry Mouth or Throat

Intercept	0.936	0.096	44.50	9.7	**<0.001**	0.742	1.130
OF THC			5.95	-1.4	0.199		
BrAC			994.59	1.4	0.157		
Time	-0.117	0.011	992.21	-11.1	**<0.001**	-0.138	-0.096
THC*BrAC	0.003	0.001	955.85	3.5	**0.001**	0.001	0.005
Time*THC	0.0016	0.0002	827.72	7.8	**<0.001**	0.0012	0.0020
Time*BrAC			994.25	1.1	0.274		
Time*THC*BrAC	-0.020	0.004	893.64	-5.1	**<0.001**	-0.028	-0.012
Subject Variance in Intercepts (THC)	0.106	0.037			**0.005**	0.053	0.211
Subject variance in Slopes (THC)					0.480		
ARH1 rho (slope-intercept covariance)	0.652	0.316			**0.039**	-0.289	0.952

Likert Feel Hungry

Intercept	0.398	0.199	65.02	2.0	**0.050**	0.000	0.796
OF THC			435.03	-1.5	0.147		
BrAC			431.91	1.0	0.298		
Time	0.498	0.040	431.36	12.6	**<0.001**	0.420	0.576
THC*BrAC			433.29	1.3	0.208		
Time*THC			439.20	1.2	0.212		
Time*BrAC			431.62	-0.7	0.481		
Time*THC*BrAC			437.25	-0.9	0.348		
Subject Variance in Intercepts			--	--	--		

(THC)							
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

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Intercept	0.105	0.022	241.61	4.7	**<0.001**	0.061	0.149
OF THC			7.36	1.5	0.164		
BrAC			975.85	-0.8	0.396		
Time	-0.016	0.004	977.34	-4.5	**<0.001**	-0.023	-0.009
THC*BrAC			975.86	-0.2	0.854		
Time*THC			976.80	0.5	0.606		
Time*BrAC			976.13	1.1	0.256		
Time*THC*BrAC			976.30	0.6	0.560		
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

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Intercept	0.099	0.032	46.07	3.1	**0.003**	0.035	0.162
OF THC			1011.88	-1.8	0.070		
BrAC			997.10	-1.5	0.142		
Time	-0.014	0.003	996.65	-4.1	**0.000**	-0.020	-0.007
THC*BrAC			1005.44	1.4	0.158		
Time*THC			1015.98	1.7	0.087		
Time*BrAC			996.83	1.9	0.061		
Time*THC*BrAC			1015.12	-1.5	0.133		
Subject Variance in Intercepts (THC)	--	--	--	--	--	--	--
Subject variance in Slopes (THC)	--	--	--	--	--	--	--
ARH1 rho (slope-intercept covariance)	--	--	--	--	--	--	--

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Intercept	0.120	0.048	45.24	2.5	**0.017**	0.023	0.217
OF THC			1012.48	-1.8	0.073		
BrAC			997.27	-1.9	0.061		
Time			996.05	-0.1	0.901		
THC*BrAC			1007.83	1.3	0.200		
Time*THC			1009.41	1.7	0.094		
Time*BrAC			997.05	0.5	0.606		
Time*THC*BrAC			1013.23	-1.1	0.255		
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

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Intercept	0.018	0.009	440.53	2.1	**0.039**	0.001	0.036
OF THC			3.33	1.1	0.342		
BrAC			994.30	1.5	0.135		

	b	SE	df	t	p		
Time	-0.003	0.001	987.49	-2.1	**0.035**	-0.006	0.000
THC*BrAC			994.68	0.1	0.900		
Time*THC			990.39	0.9	0.382		
Time*BrAC			994.39	-1.2	0.213		
Time*THC*BrAC			994.15	-0.6	0.521		
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		
Likert Upset Stomach							
Intercept	0.050	0.023	48.34	2.2	**0.033**	0.004	0.095
OF THC			1011.55	-1.6	0.109		
BrAC			997.08	-0.4	0.677		
Time	-0.007	0.003	997.06	-2.7	**0.007**	-0.012	-0.002
THC*BrAC			1005.32	0.7	0.456		
Time*THC			1008.66	1.7	0.087		
Time*BrAC			996.78	0.8	0.453		
Time*THC*BrAC			1012.68	-0.9	0.361		
Subject Variance in Intercepts (THC)			--	--	--		
Subject variance in Slopes (THC)			--	--	--		
ARH1 rho (slope-intercept covariance)			--	--	--		

Data from 19 occasional-to-moderate cannabis smokers who participated in all dosing sessions. Subjective effects were measured by 100 mm visual-analogue scales (VAS) or 5-point Likert scales (Likert) with choices 0≡"none", 1≡"slight", 2≡"mild", 3≡"moderate", 4≡"severe" after drinking placebo or active alcohol (calculated to produce approximate peak 0.065% BrAC) and inhaling placebo, 2.9% THC, or 6.7% THC vaporized cannabis (500 mg, Volcano® Medic vaporizer).

Linear mixed model results; b is parameter (coefficient) estimate for each factor (negative b indicates the parameter decreases the subjective effect; positive b indicates the parameter increases the overall effect).

Overall equation: [Subjective Effect Result] = Intercept + $b_{OF\ THC}$*[THC]$_{blood}$ + b_{BrAC}*BrAC + b_{Time}*post-dose time + $b_{THC*BrAC}$*[THC]$_{OF}$*BrAC + $b_{Time*THC}$*post-dose time*[THC]$_{OF}$ + $b_{Time*BrAC}$*post-dose time*BrAC + $b_{Time*THC*BrAC}$*post-dose time*[THC]$_{OF}$*BrAC

[a]Values in **bold** are statistically significant (p<0.05); only significant predictors are considered in the final model.

Abbreviations: SE, standard error; df, degrees of freedom; VAS, visual-analogue scale; THC, Δ^9-tetrahydrocannabinol; BrAC, breath alcohol concentration.

Supplemental Table 4. Median [range] (N) oral fluid (OF)/blood and OF/plasma Δ^9-tetrahydrocannabinol (THC), 11-nor-9-carboxy-THC (THCCOOH), cannabidiol (CBD) and cannabinol (CBN) ratios by time point after controlled vaporized cannabis and low-dose oral alcohol to healthy adult occasional-to-moderate cannabis smokers.

Time Post-Dose (h)	No Alcohol			Alcohol		
	Placebo	Low 2.9% THC	High 6.7% THC	Placebo	Low 2.9% THC	High 6.7% THC
	OF/Blood THC					
-0.8	4.0 [0.5-8.2] (5)	4.9 [3.3-7.1] (3)	1.6 [1.1-2.2] (2)	2.2 [0.8-9.0] (3)	5.2 [1.3-6.4] (4)	2.6 [2.0-8.3] (3)
0.17	2.9 [0.4-10.0] (17)	19.6 [0.8-840] (19)	27.1 [1.6-887] (19)	2.9 [1.4-30.7] (9)	23.0 [1.9-256] (19)	16.5 [0.7-723] (19)
1.4	1.7 [0.8-7.9] (6)	15.4 [0.9-225] (18)	27.8 [1.7-227] (18)	1.8 [1.2-36.4] (5)	20.8 [1.5-417] (19)	26.7 [1.3-444] (19)
2.3	1.6 [0.7-8.9] (6)	18.9 [0.8-133] (17)	21.5 [0.8-253] (15)	2.0 [1.8-4.4] (3)	16.4 [4.0-214] (16)	24.2 [1.0-452] (16)
3.3	1.7 [1.5-2.7] (4)	15.7 [2.3-110] (12)	9.6 [0.9-174] (15)	1.5 [1.3-4.6] (4)	11.9 [2.8-168] (14)	33.5 [3.2-203] (13)
6.3	0.8 [0.3-1.7] (5)	3.7 [0.7-15.3] (8)	7.1 [1.1-15.7] (7)	1.2 [0.3-1.4] (3)	4.9 [0.9-31.1] (7)	8.5 [2.1-55.9] (9)
8.3	0.5 [0.3-1.8] (3)	1.6 [0.7-49.4] (8)	1.8 [1.3-10.1] (5)	0.9 [0.3-2.0] (4)	3.7 [1.2-29.9] (5)	5.3 [0.8-28.5] (7)
	OF/Plasma THC					
-0.8	5.1 [0.6-8.2] (6)	5.9 [3.1-13.2] (5)	1.4 [1.0-8.4] (4)	2.5 [0.6-7.7] (5)	2.5 [0.7-5.5] (5)	4.8 [1.9-20.1] (4)
0.17	1.9 [0.3-7.5] (18)	15.5 [0.5-505] (19)	21.0 [1.0-585] (19)	2.8 [0.4-22.2] (11)	14.8 [1.5-156] (19)	11.5 [0.4-463] (19)
1.4	1.9 [1.1-6.8] (5)	11.3 [0.6-159] (18)	17.6 [1.4-166] (18)	2.0 [1.1-32.5] (5)	16.2 [0.9-359] (19)	18.6 [0.9-319] (19)
2.3	1.8 [1.4-6.0] (5)	13.0 [0.5-90.1] (17)	15.0 [0.5-144] (16)	1.5 [1.2-4.9] (5)	12.5 [2.3-186] (17)	20.7 [0.8-315] (18)
3.3	1.6 [1.3-4.3] (5)	7.7 [1.2-80.5] (13)	8.7 [0.7-139] (15)	1.3 [0.9-1.4] (3)	9.8 [2.1-188] (17)	19.7 [0.5-129] (16)
6.3	0.9 [0.3-1.2] (6)	1.8 [0.5-15.3] (7)	4.3 [0.8-62.2] (11)	1.2 [0.2-1.3] (4)	4.6 [0.5-35.0] (10)	5.7 [0.6-47.7] (10)
8.3	0.5 [0.2-1.5] (5)	1.5 [0.4-33.7] (9)	4.0 [0.9-46.3] (7)	0.5 [0.2-0.8] (4)	2.6 [0.4-21.8] (8)	4.6 [1.0-20.6] (9)
	OF/Blood THCCOOH					
-0.8	4.0 [1.5-10.5] (8)	3.0 [2.5-7.7] (7)	3.8 [1.2-7.7] (7)	3.9 [2.1-8.0] (6)	4.0 [1.8-12.1] (6)	3.7 [1.9-8.8] (7)
0.17	2.5 [1.2-7.9] (6)	3.2 [2.8-4.2] (7)	2.8 [0.7-3.8] (8)	3.8 [2.0-7.0] (7)	3.6 [1.3-12.5] (8)	2.9 [0.6-11.6] (9)
1.4	3.4 [1.2-9.0] (7)	2.6 [1.9-9.7] (8)	3.0 [1.2-8.7] (9)	4.9 [2.2-8.9] (9)	4.6 [2.1-17.0] (12)	4.8 [1.9-20.9] (11)
2.3	4.8 [1.4-7.2] (6)	3.4 [1.8-7.9] (9)	3.5 [2.4-11.1] (8)	6.2 [3.2-10.1] (7)	4.7 [2.6-13.6] (11)	4.5 [2.2-17.9] (12)
3.3	3.1 [1.3-5.7] (6)	3.2 [2.1-5.6] (10)	2.8 [1.3-7.2] (10)	4.7 [2.1-5.8] (7)	4.3 [2.4-14.3] (10)	4.4 [1.3-19.6] (9)
6.3	3.8 [2.1-5.9] (6)	4.3 [1.7-11.5] (9)	3.2 [1.9-5.3] (9)	4.3 [3.0-13.4] (7)	4.5 [1.5-12.3] (11)	3.5 [2.7-9.7] (8)
8.3	3.7 [2.8-11.7] (4)	4.7 [2.0-5.8] (8)	3.1 [1.5-6.3] (8)	4.0 [2.1-8.1] (6)	5.0 [1.5-9.8] (8)	2.9 [2.2-6.1] (8)
	OF/Plasma THCCOOH					
-0.8	2.7 [1.0-6.3]	1.7 [1.2-4.7]	2.0 [0.7-3.6]	2.7 [1.5-5.0]	2.7 [1.1-6.8]	2.3 [1.7-5.1]

	(8)	(7)	(7)	(7)	(6)	(7)
0.17	1.6 [1.0-4.5] (6)	2.1 [1.7-2.8] (7)	1.9 [0.5-2.6] (8)	2.6 [1.6-4.8] (7)	2.1 [0.8-7.1] (8)	1.8 [0.4-7.6] (9)
1.4	2.7 [0.9-5.7] (7)	1.8 [1.3-6.6] (8)	1.9 [0.8-4.3] (9)	3.2 [1.4-5.9] (9)	3.2 [1.1-10.6] (12)	3.5 [1.1-13.3] (11)
2.3	3.3 [1.1-4.6] (6)	2.3 [1.1-4.6] (9)	2.8 [1.4-5.5] (8)	3.9 [2.0-7.0] (7)	3.1 [1.8-8.8] (11)	3.0 [1.2-11.1] (12)
3.3	2.0 [1.0-3.6] (6)	2.0 [0.9-4.0] (10)	2.0 [0.7-3.4] (10)	3.2 [1.2-4.8] (7)	3.0 [1.6-7.9] (10)	2.5 [0.8-12.4] (9)
6.3	2.5 [1.4-4.0] (6)	3.5 [1.1-8.3] (9)	2.0 [1.0-3.4] (9)	2.8 [2.0-9.3] (7)	2.8 [1.0-8.8] (11)	2.4 [1.9-6.4] (8)
8.3	2.3 [1.9-7.0] (5)	3.2 [1.3-3.7] (8)	1.9 [0.8-4.0] (8)	2.7 [1.6-5.1] (6)	3.3 [1.0-5.8] (8)	2.0 [1.4-3.8] (8)
OF/Blood CBD						
-0.8	--	--	--	--	--	--
0.17			45.2 [2.5-183] (10)			32.8 [10.6-1607] (13)
1.4	--	--	--	--	--	--
2.3	--	--	--	--	--	--
3.3	--	--	--	--	--	--
6.3	--	--	--	--	--	--
8.3	--	--	--	--	--	--
OF/Plasma CBD						
-0.8	--	--	--	--	--	--
0.17	--	--	56.5 [2.2-1015] (12)	--	--	25.6 [8.6-1060] (16)
1.4	--	--	--	--	--	--
2.3	--	--	--	--	--	--
3.3	--	--	--	--	--	--
6.3	--	--	--	--	--	--
8.3	--	--	--	--	--	--
OF/Blood CBN						
-0.8	--	--	--	--	--	--
0.17	1.5 (1)	20.7 [1.0-173] (11)	36.7 [2.0-120] (9)	38.9 (1)	29.0 [1.4-192] (16)	28.2 [5.1-947] (14)
1.4	--	--	--	--	--	--
2.3	--	--	--	--	--	--
3.3	--	--	--	--	--	--
6.3	--	--	--	--	--	--
8.3	--	--	--	--	--	--
OF/Plasma CBN						
-0.8	--	--	--	--	--	--
0.17	1.3 (1)	10.3 [0.8-640] (14)	60.5 [1.7-118] (10)	43.5 (1)	29.8 [1.7-166] (15)	20.2 [5.3-828] (15)
1.4	--	--	--	--	--	--
2.3	--	--	--	--	--	--
3.3	--	--	--	--	--	--
6.3	--	--	--	--	--	--
8.3	--	--	--	--	--	--

Alcohol administration: oral placebo or active alcohol (calculated to produce approximate peak 0.065% BrAC). Cannabis administration: inhaled placebo, 2.9% THC, or 6.7% THC vaporized cannabis (500 mg, Volcano® Medic vaporizer). Data from 19 occasional-to-moderate cannabis smokers who participated in all dosing sessions. N represents number of paired-positive specimens contributing to the result.

Abbreviations: OF, oral fluid; THC, Δ^9-tetrahydrocannabinol; THCCOOH, 11-nor-9-carboxy-THC; CBD, cannabidiol; CBN, cannabinol.

Supplemental Table 5. (To accompany Figure 3): Regression equations and slope comparisons for (A) oral fluid (OF) Δ^9-tetrahydrocannabinol (THC) versus blood THC concentration, and (B) OF versus plasma THC concentration after low (2.9% THC) and high (6.7% THC) dose vaporized cannabis administration with and without oral alcohol to 19 healthy, adult occasional-to-moderate cannabis smokers.

A) OF versus Blood THC Figure 3A Regression Equations

	Low (2.9% THC)	High (6.7% THC)	$p_{high-low}$ (slopes)
No Alcohol	y = 34.12x + 104.5 $R^2 = 0.075$, N = 130	y = 43.40x + 85.52 $R^2 = 0.184$, N = 130	0.5123
Alcohol	y = 34.60x + 40.58 $R^2 = 0.324$, N = 131	y = 80.65x + 210.3 $R^2 = 0.153$, N = 131	0.0866
$p_{alcohol-no\ alcohol}$ (slopes)	0.9646	0.0745	Overall p (slopes, all doses): 0.0171

B) OF versus Plasma THC Figure 3B Regression Equations

	Low (2.9% THC)	High (6.7% THC)	$p_{high-low}$ (slopes)
No Alcohol	y = 25.20x + 91.54 $R^2 = 0.087$, N = 130	y = 28.98x + 92.24 $R^2 = 0.192$, N = 130	0.6925
Alcohol	y = 24.76x + 35.60 $R^2 = 0.333$, N = 131	y = 50.41x + 282.3 $R^2 = 0.141$, N = 131	0.1725
$p_{alcohol-no\ alcohol}$ (slopes)	0.9534	0.1183	Overall p (slopes, all doses): 0.0668

N represents number of specimen pairs.