

Disentangling Medicinal and Recreational Cannabis Use among People Living with HIV:

Feasibility and Preliminary Findings of an
Ecological Momentary Assessment Protocol

RSMj 2022, Boston, MA

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Cannabis Use Among People Living with HIV

- High rates of cannabis use among people living with HIV
 - 33-67% report current cannabis use in epidemiological studies¹⁻⁴
 - 44-67% of people with HIV who use cannabis report medicinal use⁴⁻⁶



¹Pacek et al. 2018; ²Harris et al. 2014; ³Tyurina et al. 2013 ;
⁴Wardell et al. 2018; ⁵Fogarty et al. 2007; ⁶Furler et al. 2004

Medicinal vs. Recreational Use

- Several studies have found differences between people living with HIV who report MCU vs. those who RCU¹⁻⁴

Medicinal Use	Recreational-only Use
↑ cannabis use frequency	↓ cannabis use frequency
↓ smoked cannabis	↑ smoked cannabis
↓ alcohol use	↑ alcohol use
↑* adherence to ARV	↓* adherence to ARV

¹Wardell et al. Drug Alcohol Depend. 2018;193(1):7-13; ²Furler et al. AIDS Patient Care STDS. 2004;18(4):215-28;

³Mannes et al. Patient Prefer Adherence. 2018;12:1363-72; ⁴de Jong et al. JAIDS 2005;38(1):43-6

Medicinal vs. Recreational Use

➤ Major limitation:

- Majority of people with HIV who use cannabis for medicinal reasons engage in concurrent recreational use (Wardell et al. 2018)
- Not possible to use between-person comparisons to distinguish between MCU and RCU for a large portion of people living with HIV

Medicinal vs. Recreational Use

- Need for within-person analyses to tease apart MCU and RCU among people with HIV who use cannabis for both reasons
- Possible that cannabis use behaviours and associated outcomes might differ ***within-person*** across different MCU and RCU events



VS



Aims

- To establish the feasibility of Ecological Momentary Assessment (EMA) to study ***within-person*** differences between MCU and RCU among people living with HIV
 - Do participants distinguish between MCU and RCU at the event-level?
- To explore within-person differences between MCU and RCU events
 - Antecedents (context, symptoms, mood)
 - Cannabis Use Behaviours (amount, type, route of admin, intoxication)
 - Acute outcomes (positive and negative consequences)

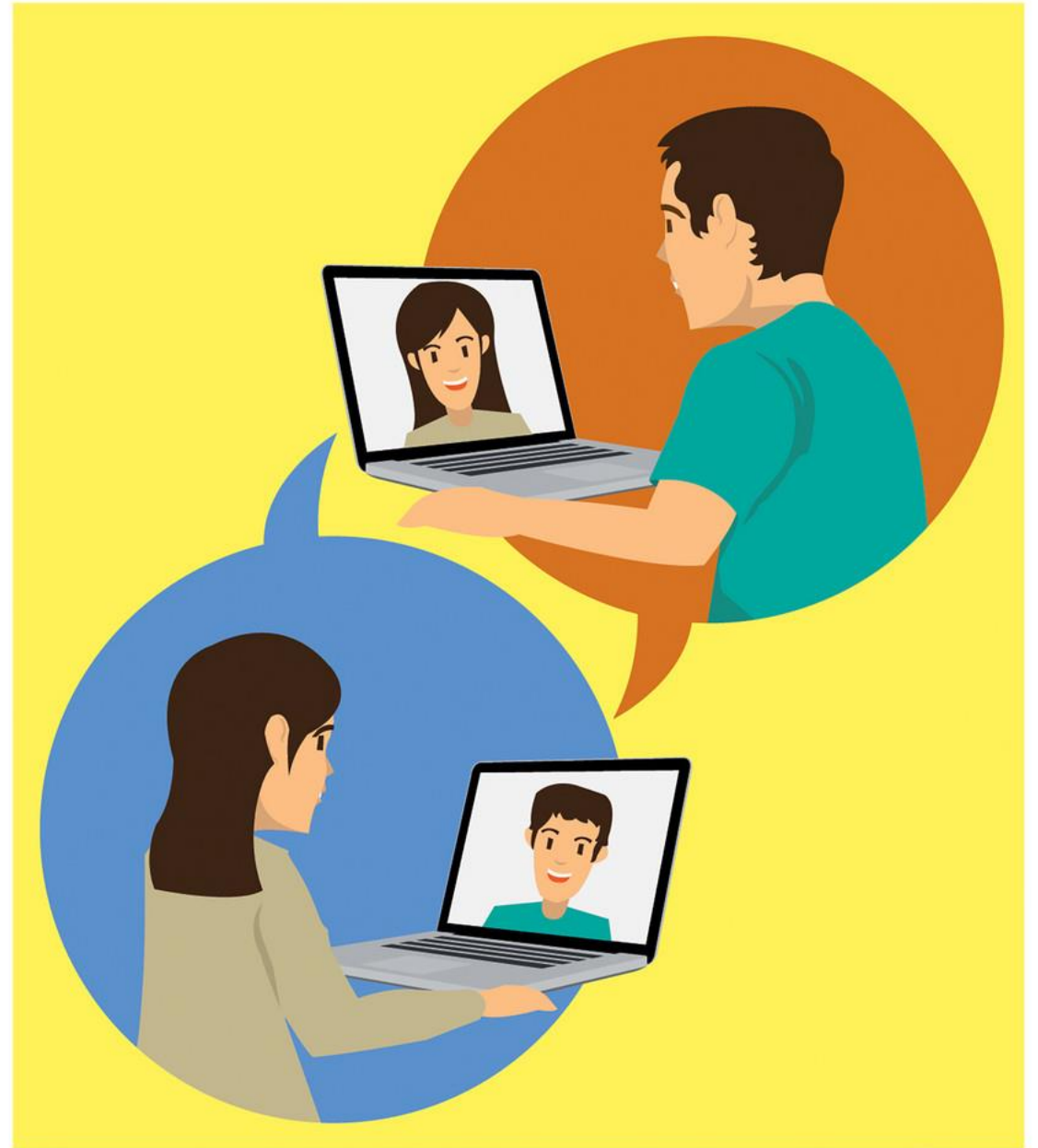
Participants

- N=29 people living with HIV completed study
 - Eligibility:
 - Daily/near daily cannabis use
 - Current MCU **and** RCU
 - Mean age = 46.69 (SD=10.77)
 - 76% male, 73% gay, 66% White, 7% Hispanic/Latinx
 - 55% valid authorization for medical cannabis
 - Past 30-day cannabis consumption at baseline
 - $M = 28.63$ grams ($SD=35.36$) cannabis flower

Procedure

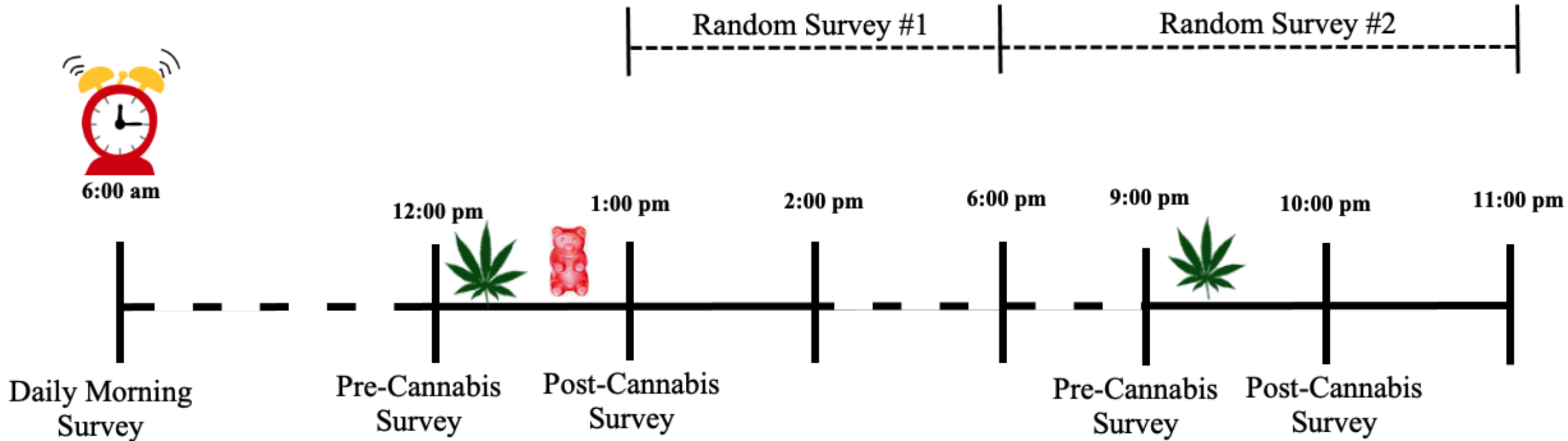
> Baseline virtual interview

- Informed consent
- Timeline Follow Back
 - Past 30-day cannabis use
- Install EMA app (Metricwire, Inc.)
- EMA tutorial



Procedure

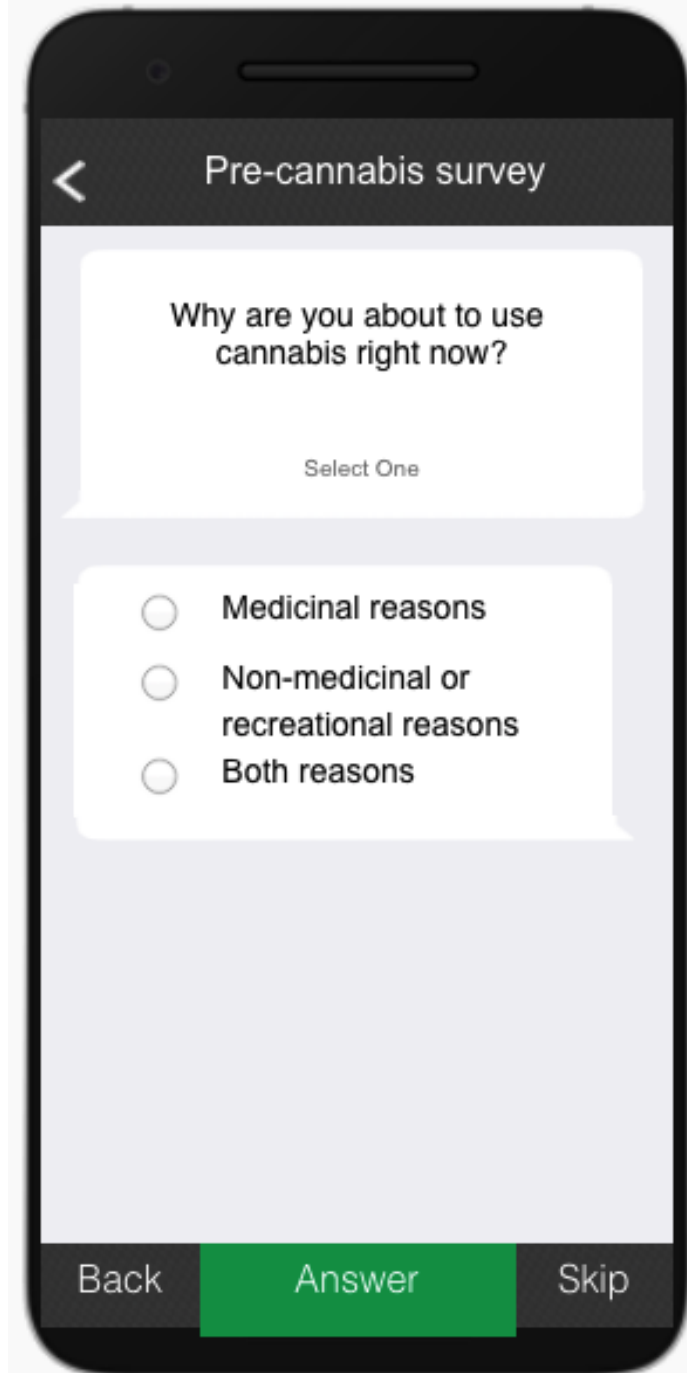
- EMA designed to capture all cannabis events for a 14-day period



Procedure

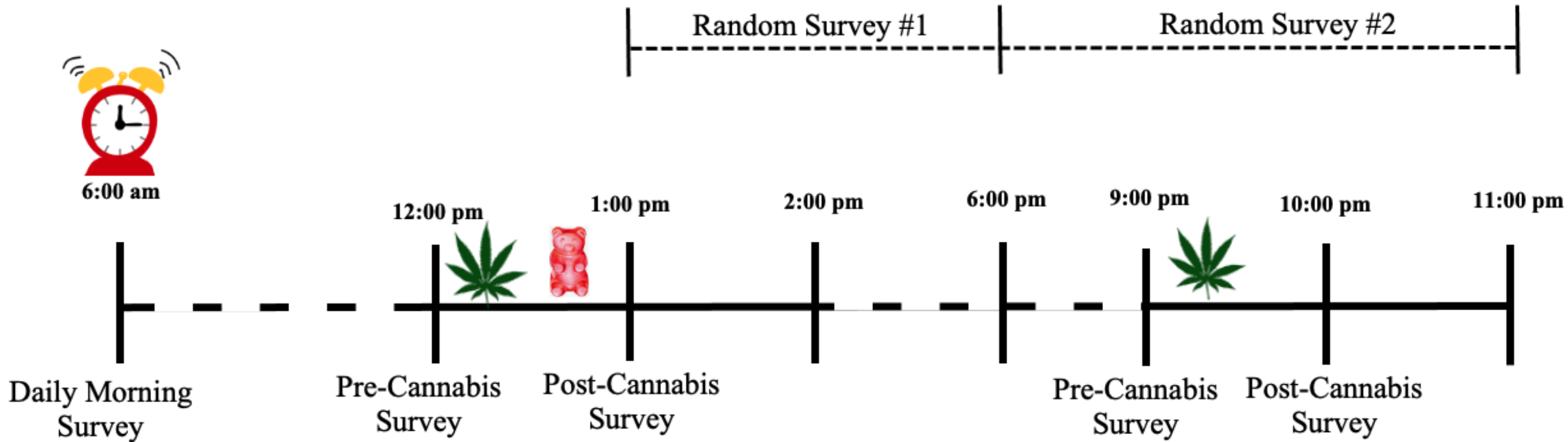
➤ Pre-cannabis survey

- MCU vs. RCU event
- Specific reasons
 - E.g., manage symptoms, med substitution, relaxation, socialize
- Current symptoms
- Positive and negative mood
 - 7 items from PANAS
- Location and social context



The image shows a smartphone screen displaying a survey titled "Pre-cannabis survey". The survey question is "Why are you about to use cannabis right now?". Below the question, it says "Select One". There are three radio button options: "Medicinal reasons", "Non-medicinal or recreational reasons", and "Both reasons". At the bottom of the screen, there are three buttons: "Back", "Answer" (highlighted in green), and "Skip".

Procedure



Procedure

> Post-cannabis survey

- Route of administration
- Type of cannabis used
- Grams of cannabis flower
 - Visual aid
- Cannabis “high”
- Positive and negative consequences

The image displays two smartphone screens from a survey application. Both screens have a dark header with a back arrow and the title "Post-cannabis survey".

The left screen shows a question: "How did you consume cannabis since the pre-cannabis survey? (check all that apply)". Below the question is a white box with the text "Check all that apply". Underneath is a list of four options, each with an unchecked checkbox: "Smoked", "Vapourized", "Ate/drank/swallowed", and "Other". At the bottom of the screen are three buttons: "Back", "Answer" (highlighted in green), and "Skip".

The right screen shows a question: "How high do you feel right now?". Below the question is a white box with the text "Click the bar below to select. Click again or drag to change your choice.". Below this is a horizontal slider bar. The bar is blue on the left and grey on the right, with a white circle marker positioned approximately one-third of the way from the left. The left end of the bar is labeled "Not at all" and the right end is labeled "Extremely". At the bottom of the screen are three buttons: "Back", "Answer" (highlighted in green), and "Skip".

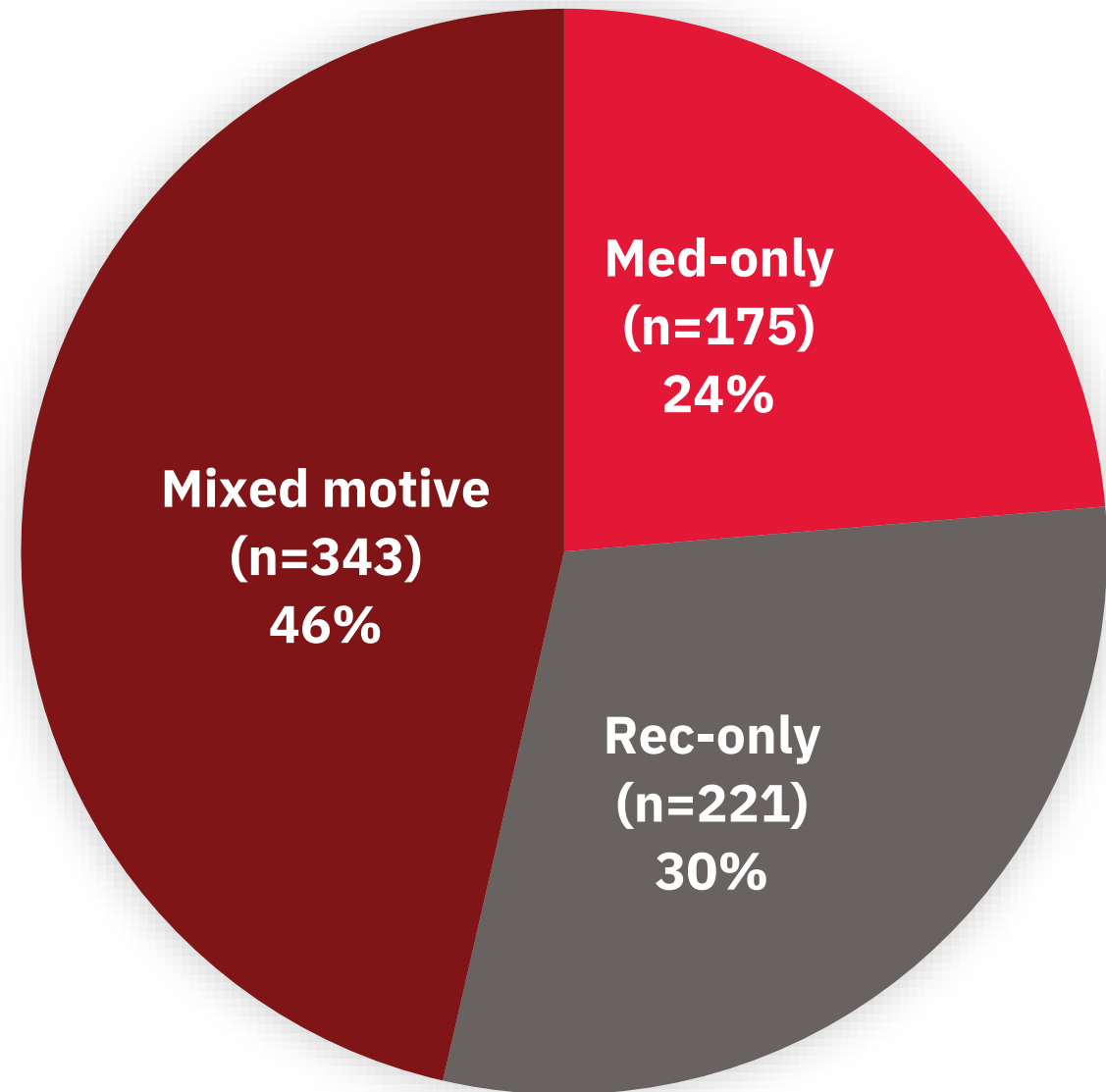
Results

› Survey completion

- 739 pre-cannabis surveys across all participants and all days
 - $M=25.48$ ($SD=15.63$) cannabis events per participant
- 80% compliance rate for post-cannabis surveys

Results

- General motives for cannabis use reported on pre-cannabis surveys
- Some specificity in event-level motives

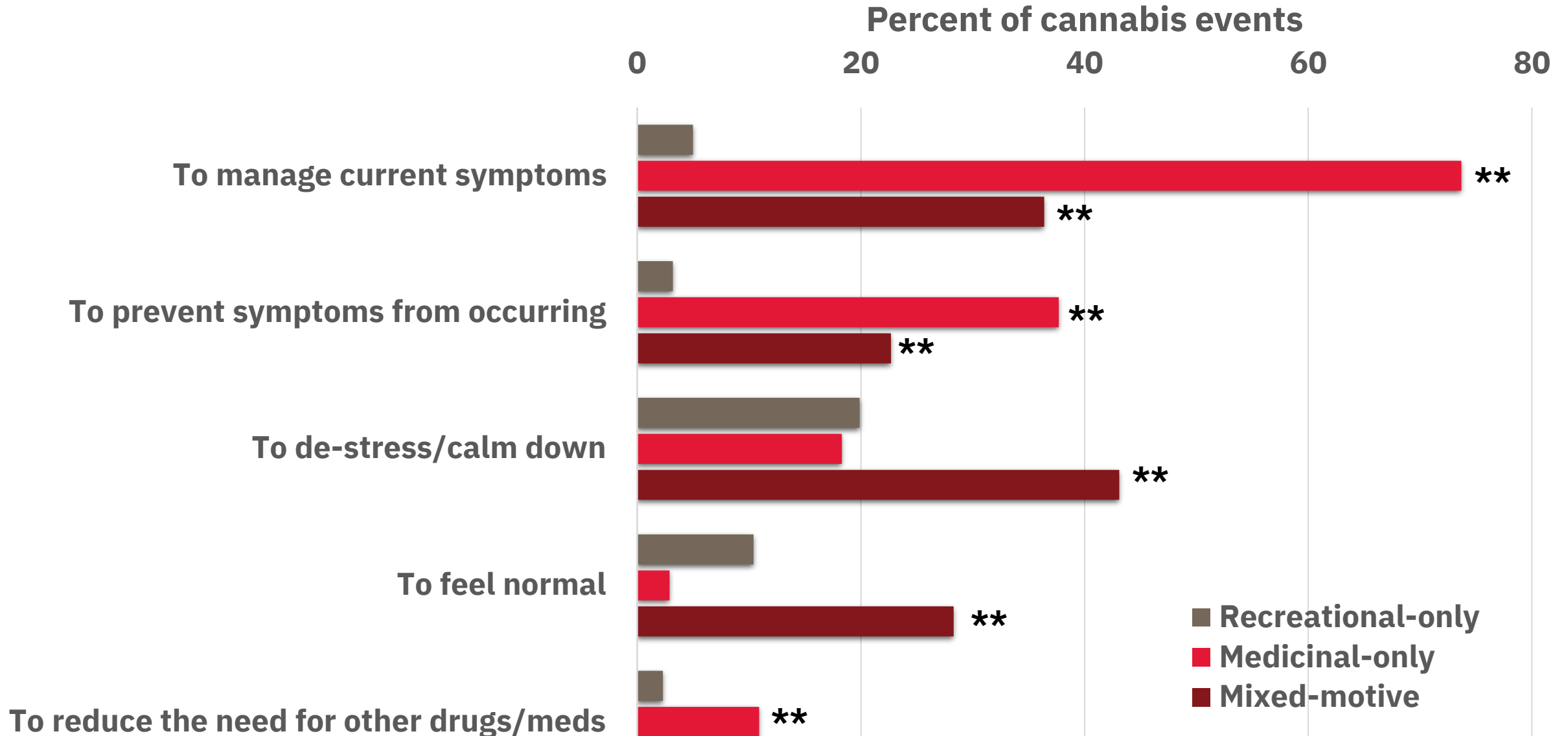


Results

- Multilevel modelling to examine within-person differences across medicinal and recreational cannabis use events
 - Contrasts
 - MCU-only vs. RCU-only (ref)
 - Mixed-motive vs. RCU-only (ref)
 - Controlled for between-person differences in proportion of MCU only and mixed-motive events¹
 - Logistic regression for binary outcomes, linear for continuous outcomes
 - Covariates: Age, gender, race (white vs. other)

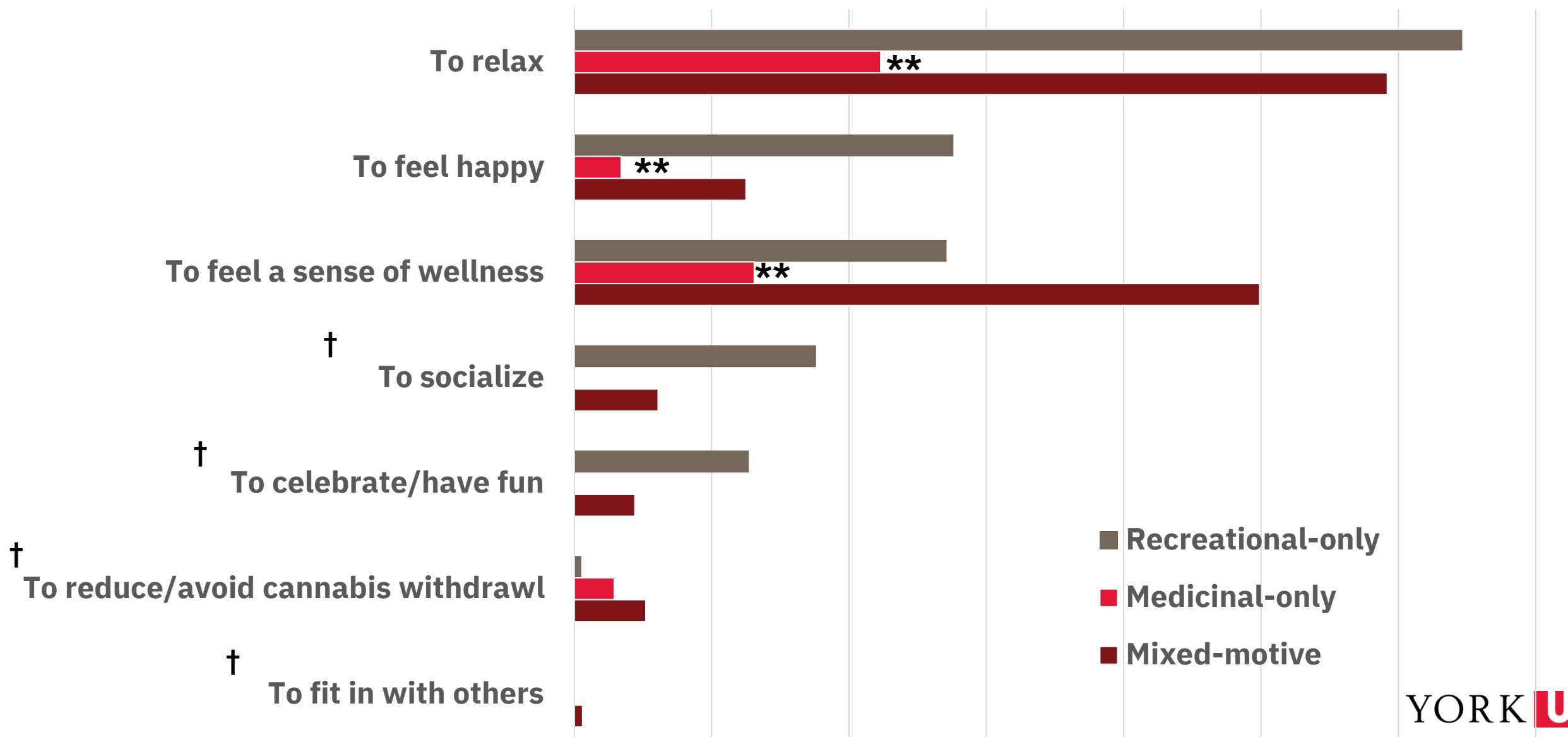
¹Yaremych, H. E., Preacher, K. J., & Hedeker, D. (in press). *Psychological Methods*.

Specific Reasons for Cannabis Use



Percent of cannabis events

0 10 20 30 40 50 60 70

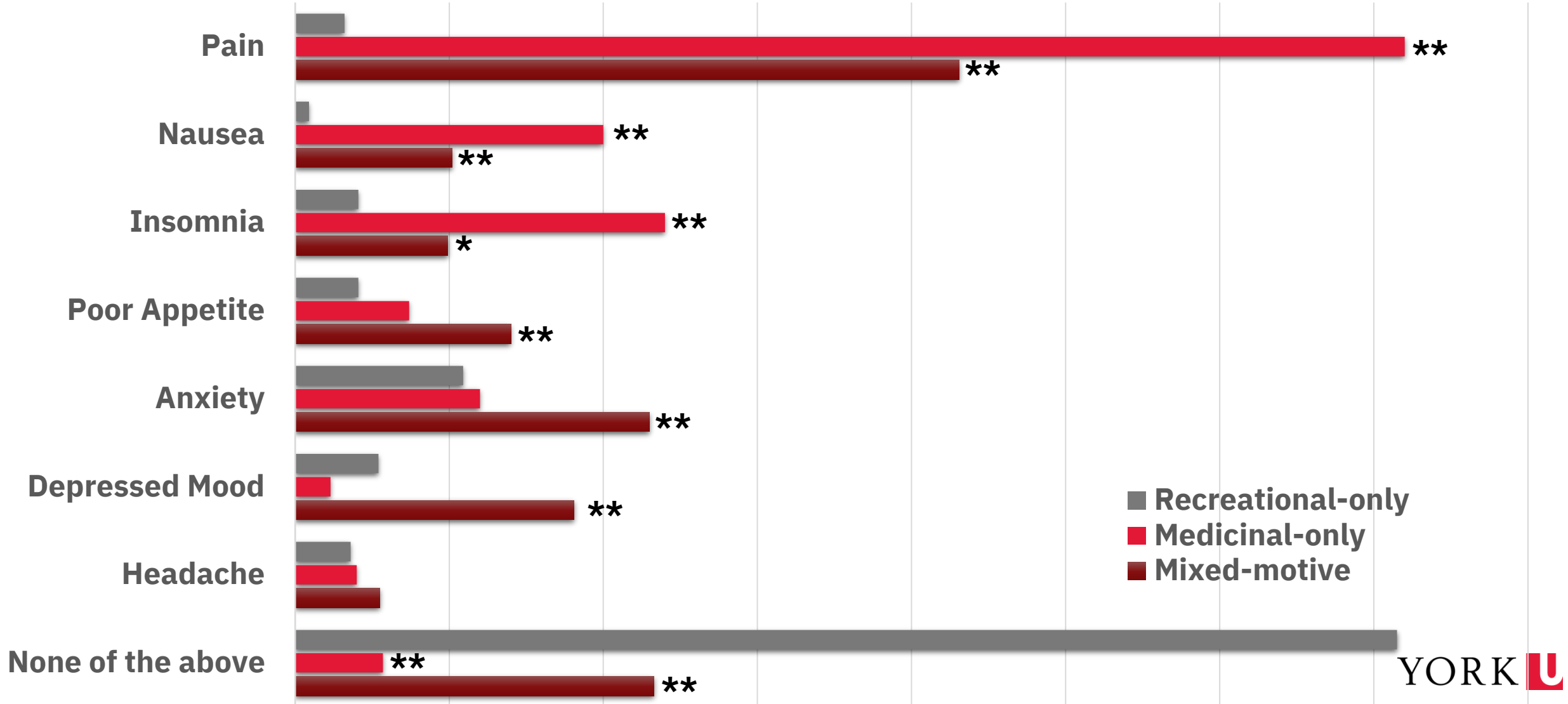


■ Recreational-only
■ Medicinal-only
■ Mixed-motive

Pre-Cannabis Symptoms

Percent of cannabis events

0 10 20 30 40 50 60 70 80



■ Recreational-only
■ Medicinal-only
■ Mixed-motive

Results

➤ Pre-cannabis mood

	<i>B</i>	<i>SE</i>	<i>p</i>
Negative mood			
MCU-only (vs. RCU-only)	0.41**	0.07	<.001
Mixed-motive (vs. RCU-only)	0.36**	0.06	<.001
Positive mood			
MCU-only (vs. RCU-only)	-0.68**	0.10	<.001
Mixed-motive (vs. RCU-only)	-0.43**	0.08	<.001

Results

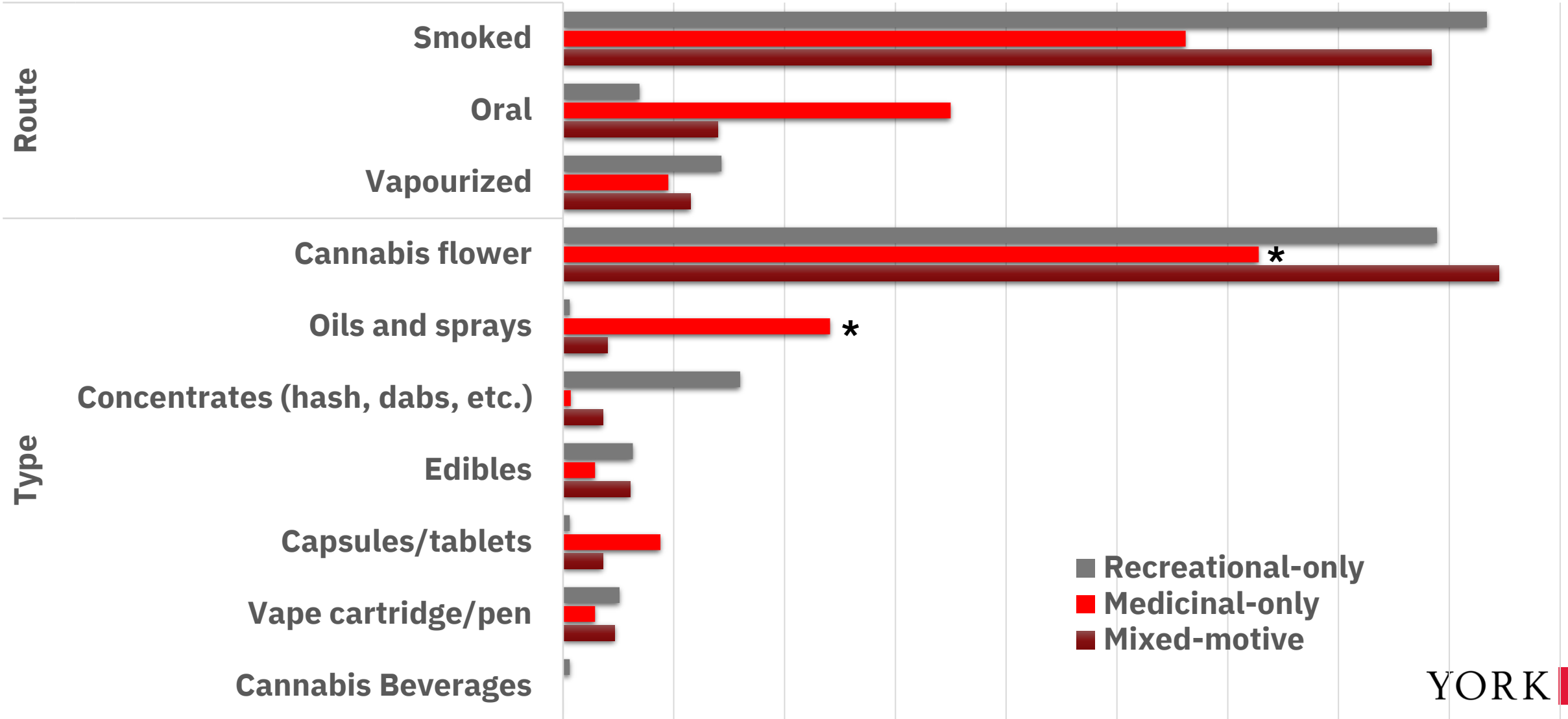
> Pre-cannabis context

	<i>B</i>	<i>SE</i>	<i>p</i>	<i>OR</i>
Home (vs. out)				
MCU-only (vs. RCU-only)	1.80*	0.66	.007	6.02
Mixed-motive (vs. RCU-only)	0.50	0.36	.166	1.64
Alone (vs. w/ someone)				
MCU-only (vs. RCU-only)	1.83**	0.48	<.001	6.23
Mixed-motive (vs. RCU-only)	0.66*	0.33	.048	1.93

Cannabis Use (Post-Can Surveys)

Percent of cannabis events

0 10 20 30 40 50 60 70 80 90



■ Recreational-only
■ Medicinal-only
■ Mixed-motive

Results

➤ Cannabis use (post-cannabis surveys)

	<i>M</i>	<i>SD</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Cannabis flower (grams)					
RCU-only (ref)	0.48	0.49			
MCU-only	0.48	0.27	-0.08	0.04	.075
Mixed-motive	0.43	0.28	-0.09*	0.04	.013
Cannabis “high”					
RCU-only (ref)	2.66	1.34			
MCU-only	2.10	1.22	-0.57**	0.14	<.001
Mixed-motive	2.36	1.07	0.04	0.12	.728

Results

➤ Cannabis use (post-cannabis surveys)

	<i>B</i>	<i>SE</i>	<i>p</i>	<i>OR</i>
Any negative consequence				
MCU-only (vs. RCU-only)	0.27	1.08	.804	1.31
Mixed-motive (vs. RCU-only)	0.05	0.84	.953	1.05
Any positive consequences				
MCU-only (vs. RCU-only)	-1.62**	0.39	<.001	0.20
Mixed-motive (vs. RCU-only)	-0.67*	0.34	.045	0.51

Conclusions

- EMA is a feasible approach for disentangling MCU and RCU at the event-level among people living with HIV who engage in **both** MCU and RCU
 - Some events “purely” medicinal and some “purely” recreational
- BUT, nearly half of cannabis use events were mixed-motive
 - Not possible to fully disentangle MCU and RCU even at most basic level
 - Move away from discrete labels toward continuum of MCU and RCU



Conclusions

- Significant within-person differences between MCU and RCU in antecedents, cannabis use behaviours, and immediate outcomes

MED-only	Mixed-motive	REC-only
-At home alone	-Alone	-Out with others
-Symptom management, drug substitution	-Negative reinforcement (de-stress, feel normal)	-Happiness and relaxation
-Physical symptoms	-Physical AND mental health symptoms	-Absence of symptoms
-Cannabis oils and sprays	-Cannabis flower	-Cannabis flower
-Less pos consequences	-Less pos consequences	-More pos consequences

Conclusions

> Strengths

- First study to examine within-person differences between MCU and RCU
- EMA reduces recall bias, permits examining temporal associations

> Limitations

- Not powered to examine between-person moderators
- THC and CBD content not assessed
- Timing of post-cannabis survey (1 hour later)
- Brief assessment period

Conclusions

➤ Future Directions

- Larger study to extend findings, examine between-person moderators

➤ Clinical Implications

- Inform ecological momentary interventions
- Content tailored for MCU and RCU events

Acknowledgements/Disclosures

- Supported by funding from the CIHR Canadian HIV Trials Network (CTN PT037) and the Canadian Institutes of Health Research (PJT 159754)
- Co-investigators:
 - Rueda, S., Fox, N., Costiniuk, C., Jenabian, M.-A., Margolese, S., Mandarino, E., Shuper, P., Hendershot, C.S., Cunningham, J., Arbess, G., Singer, J.
- Special thank you to our community member co-investigators
- No conflicts of interest

EXTRA SLIDES

Participants

	n (%)		n (%)
Gender		Employment Status	
Male	22 (76%)	Full time	13 (45%)
Female	6 (21%)	Part time	5 (17%)
Non-binary	1 (3%)	Unemployed	11 (38%)
Sexual Orientation		Household Income^b	
Gay	21 (73%)	Below \$20,000	6 (21%)
Lesbian	1 (3%)	\$20,000-\$49,999	9 (31%)
Bisexual	2 (7%)	\$50,000-\$99,999	11 (38%)
Heterosexual/straight	4 (14%)	\$100,000 or more	2 (7%)
Other	1 (3%)		
		Highest Education	
Race/Ethnicity^a		Highschool or less	4 (14%)
Hispanic/Latinx	2 (7%)	Some college	6 (21%)
White	19 (66%)	Associates or technical degree	6 (21%)
Black/African	3 (10%)	Bachelor's degree or higher	13 (45%)
Other	8 (3%)		

Results

- Tobacco/nicotine use
 - 40% MCU-only
 - 22% RCU-only
 - 27% mixed-motive

- Alcohol Use
 - 10% MCU-only
 - 18% RCU-only
 - 9% mixed-motive

- Other drug use uncommon (<1% of events)

- Within-person differences not significant

Ecological Momentary Assessment

- Permits examination of within-person differences in the motives that precede individual cannabis use events
 - Could help to disentangle MCU and RCU at the event level
- Several studies have used EMA to study substance use, including cannabis, among people living with HIV¹⁻³
 - But, no EMA studies of within-person differences between MCU and RCU

¹Kuerbis et al. Alcohol. 2019; ²Paolillo et al. Addict Behav. 2018; ³Rendina et al. 2018.