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Tracking via Repeated Assessment of Joint E-Cigarette and Tobacco use (TRAJECT): Descriptive and qualitative findings exploring dual use trajectories

No conflicts of interest



BACKGROUND

- 47% of vapers in England also smoke (dual users) ([Kock et al, 2022](#))
- The full cancer reduction benefits are only realised if full switching to e-cigs away from tobacco occurs
- Most dual users will return to exclusive smoking within 6 months of initiation ([Hinton et al 2018](#), [Sweet et al 2018](#))
- Dual use can be a pathway to full cessation ([Notley et al, 2020](#))
- No formal definition for dual use and it is a highly variable behaviour



OBJECTIVES



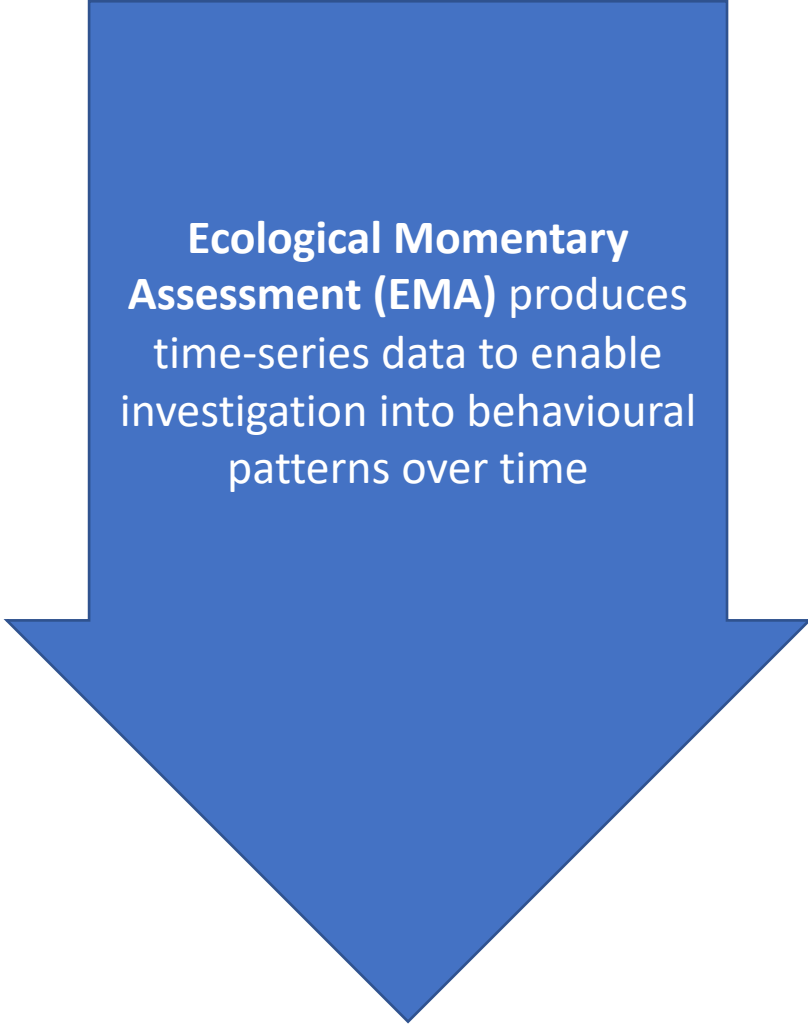
1) To investigate within-person patterns and trajectories of dual use behaviour



2) To identify within-person predictors of tobacco use, relapse and cessation



3) To understand participant perspectives on their dual use behaviour and person-centred explanations for changes in patterns over time



Ecological Momentary Assessment (EMA) produces time-series data to enable investigation into behavioural patterns over time



METHOD

Recruitment via social media

Baseline data collection

Daily survey for 90 consecutive days
usage, motivation, mood, alcohol use, social support, identity

Summary report sent to participant

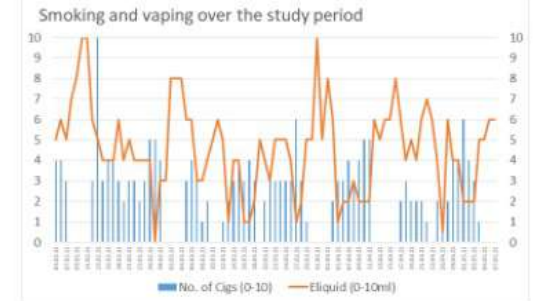
Qualitative interview

TRAJECT SUMMARY REPORT PARTICIPANT 12

YOUR VAPING AND SMOKING OVER 85 DAYS BETWEEN 05.02.21 AND 07.05.21

Funded by CANCER RESEARCH UK

YOUR SMOKING AND VAPING PATTERNS



- You told us that you dual used 60/85 days, only smoked (no vaping) on 1/85 days and only vaped 24/85 days.
- You smoked between 0 and 10 cigarettes per day (ave. 2) and used between 0 and 10ml of e-liquid per day (ave. 5ml).
- You tended to vape more on the days you smoked fewer cigarettes.
- Monitoring device and survey data were collected for 76/85 days:

YOUR MOOD AND ALCOHOL USE



- You told us that you drank alcohol (at the time of filling in the survey) on 24 days and had a maximum of 8 drinks.
- You tended to smoke more on the days where you experienced stress or drank alcohol.
- You told that you thought that stressful events influenced your dual use.

After some drinks cigarettes always seem to come hand in hand with alcohol, sadly. Hopefully Monday will bring a new start to vaping. It

WHERE YOU SMOKED AND VAPED, AND HOW MUCH TIME YOU SPENT WITH OTHER VAPERS AND SMOKERS



You told us you spent at least a little of the day with other smokers on two-thirds of the days (61/85). On the days that you spent more time with other smokers you tended to smoke more and vape less.



METHOD: VAPIO LEVEL DEVICE

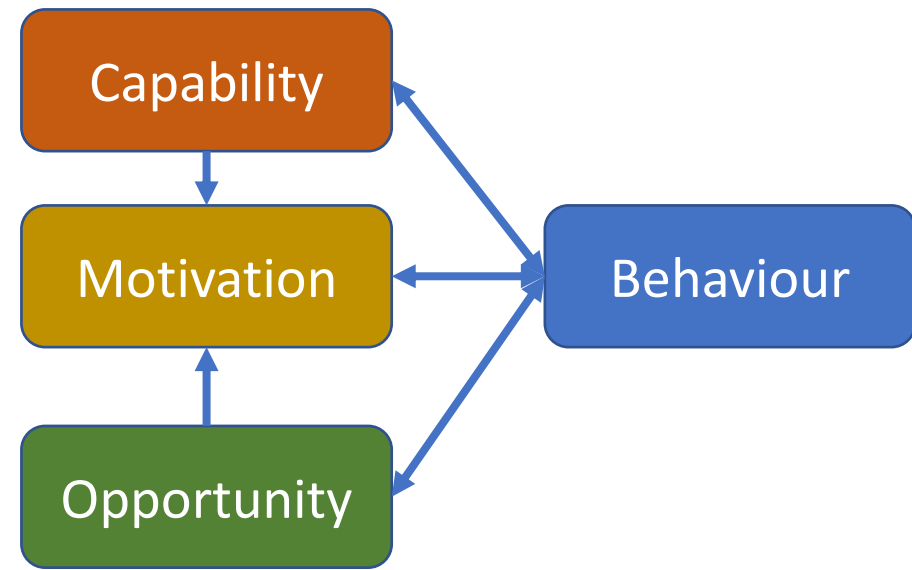


- Monitoring device to fit tank based e-cig system (11 participants)
- Measures puff quantity, duration and power
- Will soon be commercially available at <https://www.getlevl.io/>



INTERVIEW METHOD

- **EMA follow up qualitative** interview provides context and explanation of EMA study period quant data – but also what happened after the study period
- Descriptive statistics collated for each participant
- Narrative case summaries
- Inductive thematic analysis
- Analysis situated in COM-B framework





RESULTS: SAMPLE

- 19 participants included in analysis
- 12 female
- Age range 20 to 61 years
- 6 routine and manual occupations
- 4 unemployed or unable to work
- All white British
- Vaping ≤ 3
- 1-20 CPD at baseline

15/19 completed FU interview



Photos provided by TRAJECT participants



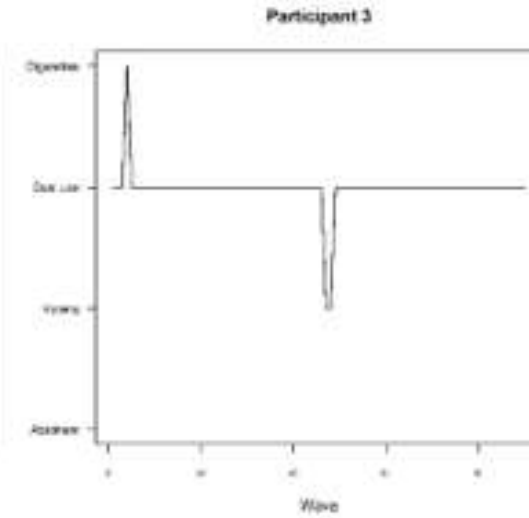
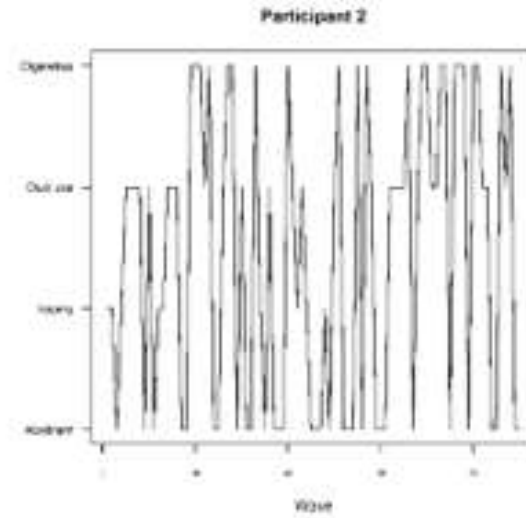
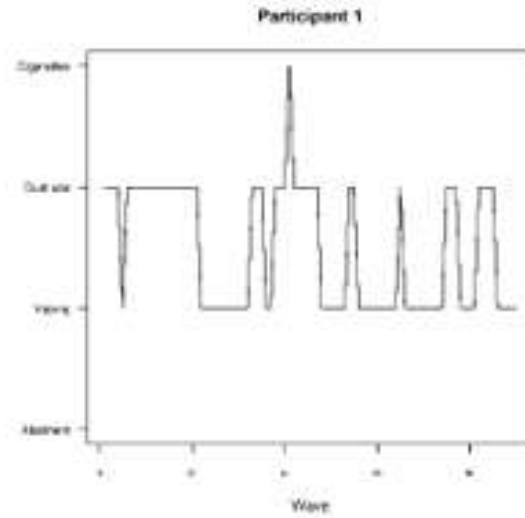
Example of individual trajectories

Tobacco

Dual use

Vaping

Abstinence

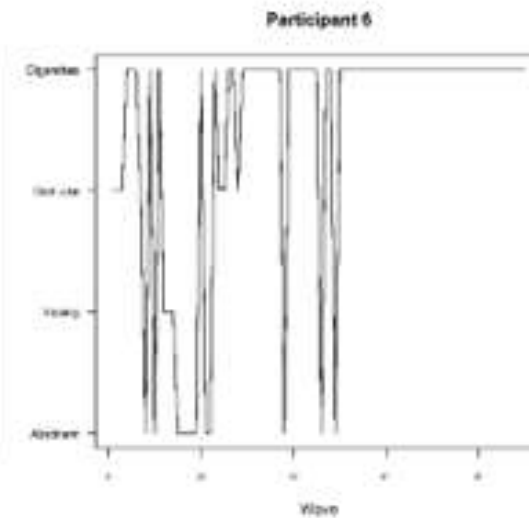
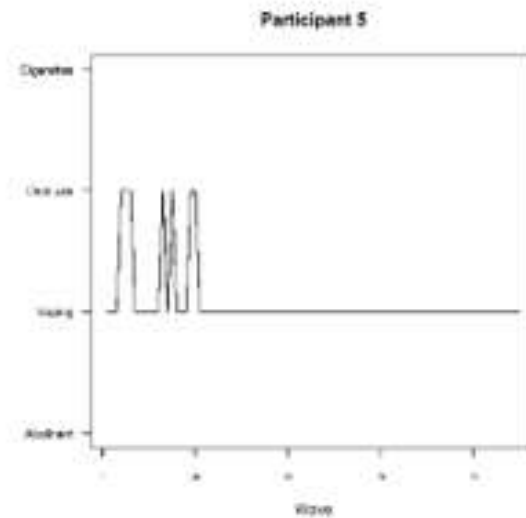
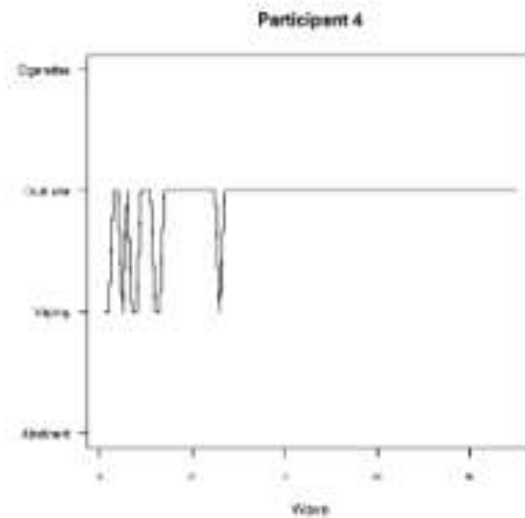


Tobacco

Dual use

Vaping

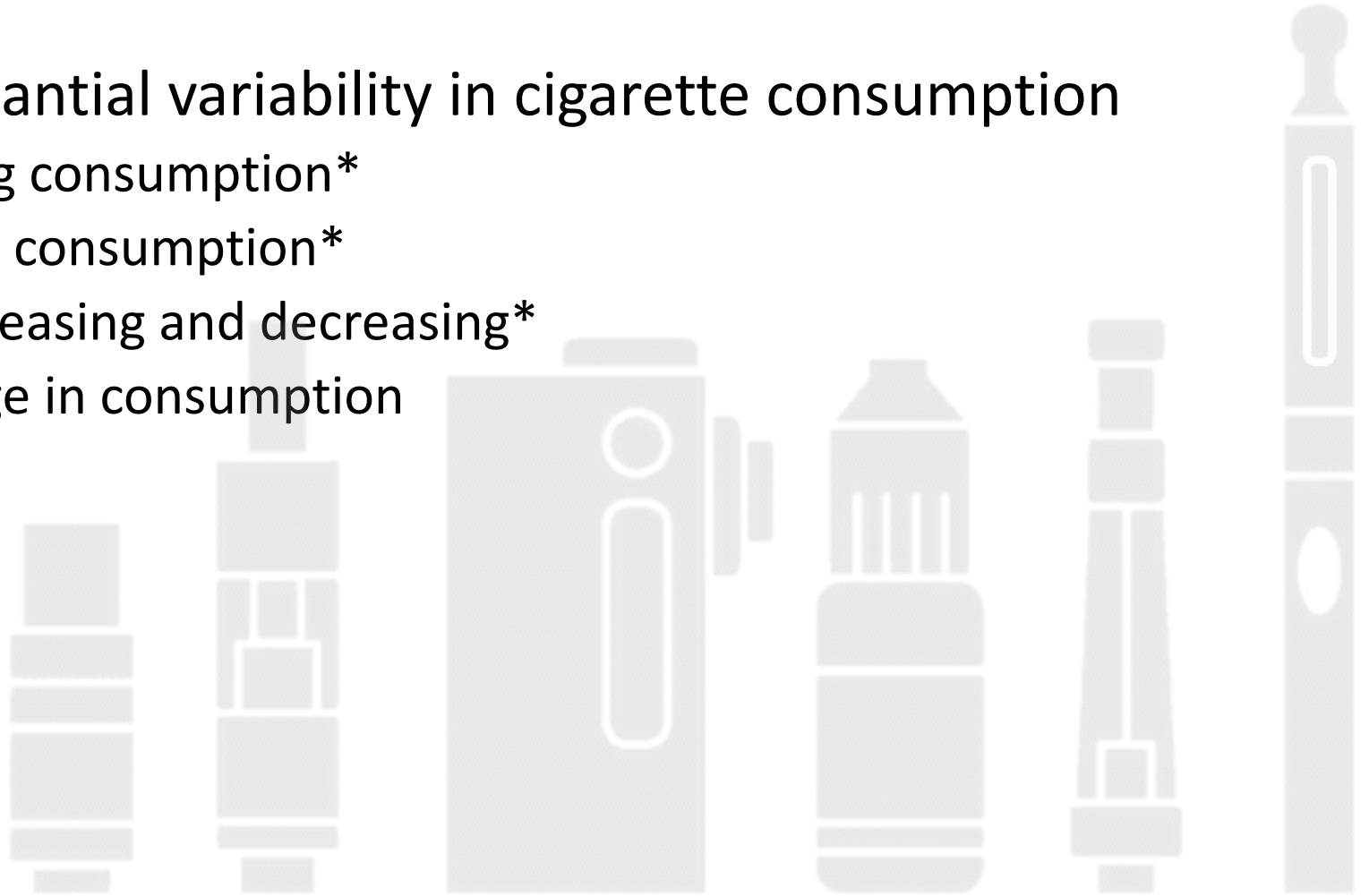
Abstinence





Tobacco patterns of use (emergent findings)

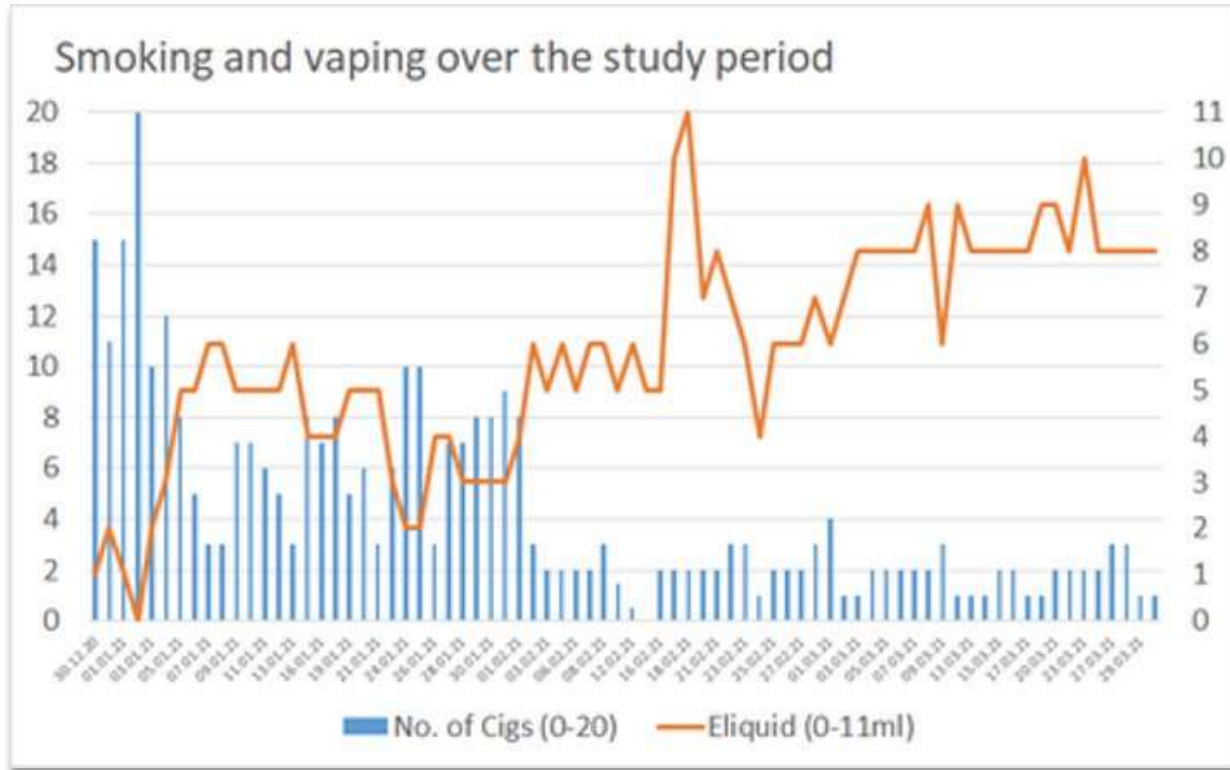
- Individual analysis: substantial variability in cigarette consumption
 - 42% (n=8) had decreasing consumption*
 - 26% (n=5) had increasing consumption*
 - 16% (n=3) pattern of increasing and decreasing*
 - 16% (n=3) no clear change in consumption



* Statistically significant at $p < 0.05$



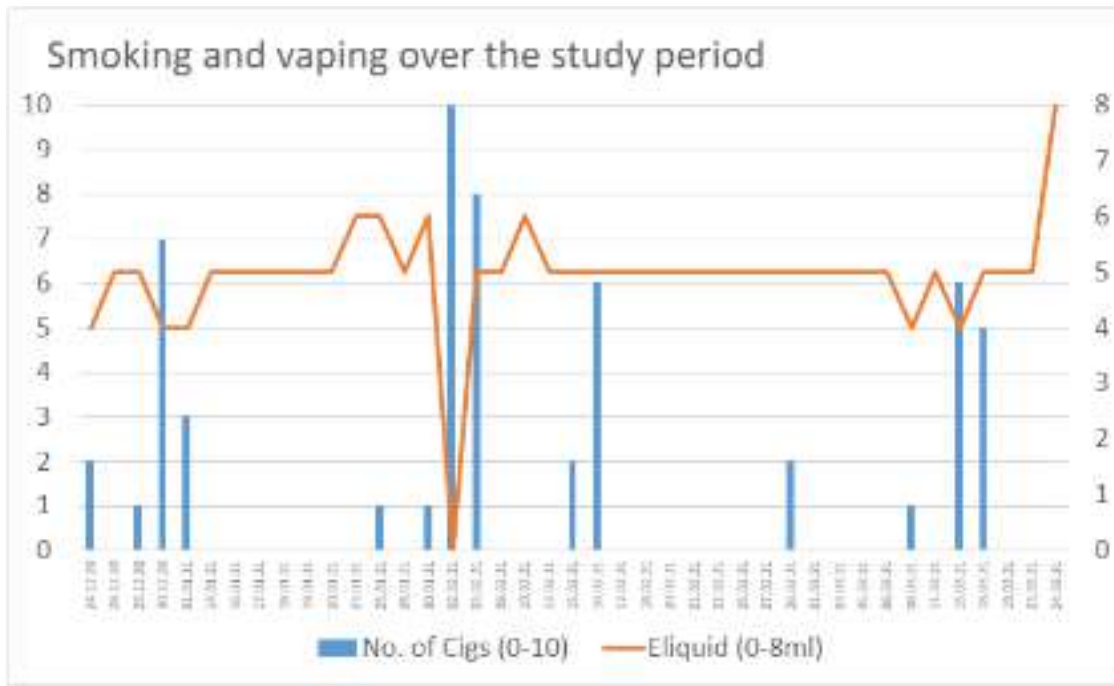
Decreasing/increasing smoking: Motivation themes



I made a conscious effort [start of Feb] to cut right down to one or two a day. I do have quite strong will power and when I made the decision I know I can. Around that time I got my new vape and I started making my own juices... The major breakthrough for me was making the transition from smoking to vaping with the drink, that was quite difficult for me. (P4)



Fluctuating/no change: Opportunity/habit themes



If I forget my E Cig, then yeah, I'm smoking. There was the day where my dad took me to work. We got halfway there when I realized I had left my E-Cig, so I didn't have my bank card on me that day, so I told my dad to stop at the shop and buy me some cigarettes, which is probably the day of that February one, probably that blip.

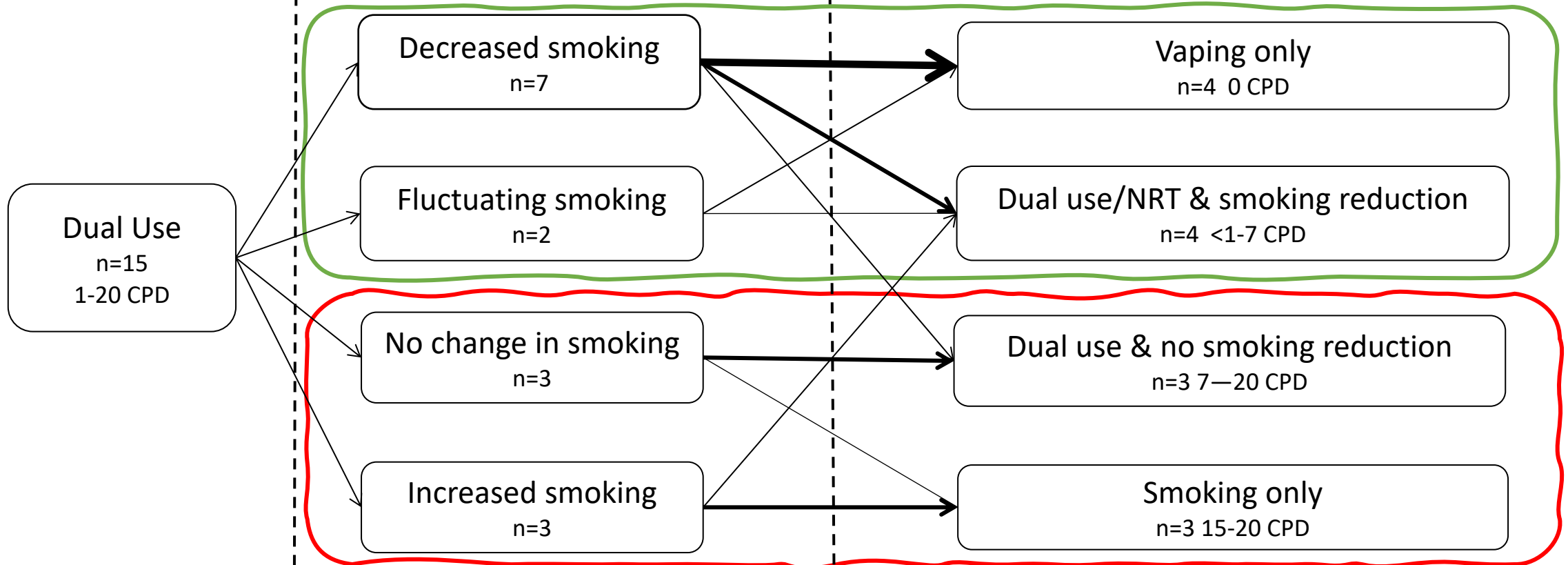


Pathway to follow up (emergent findings)

Baseline:
2-13 weeks since
e-cig initiation

EMA period (90 days):
Ending 14-26 weeks since e-cig initiation

Follow up interview:
18-40 weeks since e-cig initiation





Capability

Vaping Only	Dual use with smoking reduction	Dual use with no smoking reduction	Smoking only
High confidence/ability to use e-cigs	Mixed confidence/ability to use e-cigs	Mixed confidence/ability to use e-cigs	Low confidence/ability to use e-cigs
Wide range of quitting strategies	Limited quitting strategies	Limited quitting strategies	Limited quitting strategies
			Vaping intolerance

I used to do is just go upstairs and brush my teeth. Or drink a bottle of water. And just start getting busy watching something on television or reading a magazine. Just anything to take my mind off it.

The vape juice really irritated my throat especially, and it would just give me this really persistent tickly cough



Motivation

Vaping Only	Dual use with smoking reduction	Dual use with no smoking reduction	Smoking only
Willpower, right mindset and confidence	Willpower, right mindset and confidence	Low willpower	Low willpower
High vape satisfaction	Moderate to high vape satisfaction	Low to high vape satisfaction	Low vape satisfaction
Non-smoker identity	Future non-smoker identity	Future non-smoker identity	Smoker identity
	“Permissive” smoking	“Reluctant” smoking	“Reluctant” smoking

Other ones that I've tried in the past when you draw in the vapour, the others aren't as strong. So, this one really gives me a good draw.

I still enjoy the cigarette with my coffee in the morning. I could quit but I don't see it as a problem.



Opportunity

Vaping Only	Dual use with smoking reduction	Dual use with no smoking reduction	Smoking only
Good social support	Some social support	Some social support	Perceived pressure to quit from family/friends
Limited smoking opportunities	Opportunities to smoke	Opportunities to smoke	Opportunities to smoke
Accessed vape shop support			

He'll go to me, "mum, do you want a cigarette?" And I'll go "yeah, go on then". Instead of like "no, I'll use my vape" – it's easier just to take the cigarette off him.

It makes me feel embarrassed in front of my entire family because, like my dad obviously knows I smoke and he absolutely hates it and I get that kind of judgy look from him every time I go out for a cigarette.




DISCUSSION

- Dual use behaviour (within first six months of e-cig initiation) can be highly variable, dynamic and individualised
- Success not just about the e-cig! Also motivation to quit, adopting other strategies, supportive environment, etc.
- Interventions need to be bespoke and focus on educating about the health benefits of switching completely; increasing vaping belief, confidence and satisfaction; changing environment and strategies for coping in triggering situations

Next steps: finalise analysis and triangulate quant and qual



Thank you!!
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Vape satisfaction was the most common individual predictor of next day tobacco abstinence vs. dual use.

However, **some predictors**, such as self-efficacy and smoking urges, operated in opposite directions of effect for different individuals.



NO CONFLICTS OF INTEREST

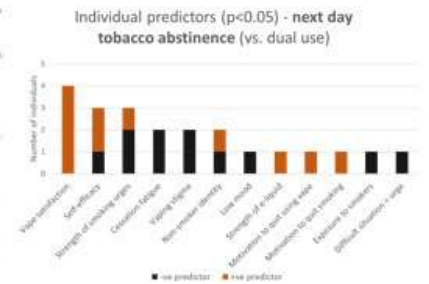
Within-person predictors of patterns of dual e-cigarette and tobacco use: the Tracking via Repeated Assessment of Joint E-cigarette and Tobacco use (TRAJECT) study

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Devesh Dhillon (UEA), Lynn Stalder (UEA), Harriet Cole (UEA), Niall O'Connell (UEA), Catherine Hawton (UEA), Ewanine Coombes (SMH), Alan Tate (UEA), Gaila Toddy (UEA)

Introduction
In the UK, half of young e-cigarette tobacco dual users¹ only by changing tobacco use. Dual users gain the full nicotine provision benefits of using e-cigarettes as a substitute for tobacco. Most dual users will return to nicotine smoking within 6 months of initiation.² However, dual use can be a pathway to full cessation.³ Increasing our understanding of adults factors predict cessation may from dual use will help inform interventions to support tobacco abstinence. However, existing research data from dual users about predictors of use only tells us about average relationships between participants. This can lead to an overestimation of the factors which predict individual dual use behaviour. To address this gap, we conducted within person predictors of 72 episodes of exclusive tobacco use, episodes of abstinence from tobacco use, among dual users.

Methods
A series of single-case (N=41) investigations (N=24: 65% female, 55% low SES) using Ecological Momentary Assessment (EMA).
Participants were purposively recruited as smokers who, in the last 3 months, alternated vaping.
Participants completed daily measures for 90 days reporting e-cigarette and tobacco use and hypothesized psychological predictors of dual use.
Generalized Additive Mixed Models (GAMM) were run to identify predictors.

Results
When data was aggregated, using multivariate models we found that exposure to other vapors on a given day independently predicted a reduced risk of exclusive tobacco use the next day (OR=0.30, 95% CI 0.15, 0.64). High nicotine to quit smoking (OR=2.22, 95% CI 1.06, 4.22) and satisfaction with vaping device (OR=1.52, 95% CI 1.18, 2.42) independently predicted next day tobacco abstinence compared to dual use.
However, single case analyses identified a more varied set of predictors of both next day exclusive tobacco use and next day tobacco abstinence. These included: quitting self-efficacy, cessation fatigue, urges to smoke, strength of nicotine dependence, identity, vaping stigma, smoking stigma, stress and exposure to smokers (p<0.05).
The direction of effects for some predictors were different for some participants. For next day exclusive tobacco use, the following were both positive and negative predictors, depending on the individual: strength of smoking urges, vaping stigma, cessation fatigue, reduction to quit using a vape and craving stigma. For prediction of next day abstinence, predictors with different directions of effect included self-efficacy, strength of smoking urges, and non- smoker identity.

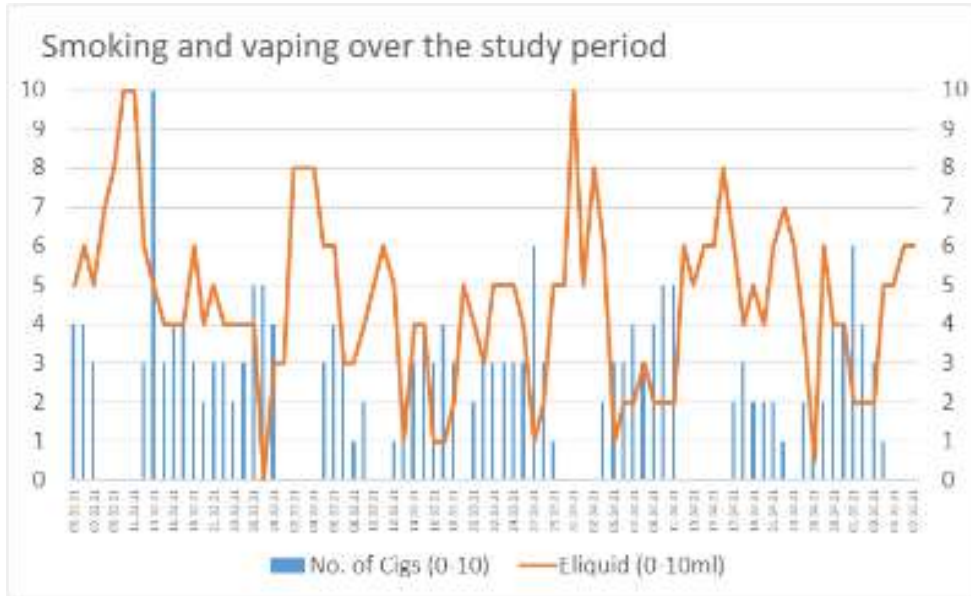


Conclusions
Multiple psychological, social and environmental factors predict days of next-day use among recent dual users and show varied substantially between individuals, including direction of effect. This knowledge reveals the importance of providing tailored interventions to promote abstinence from tobacco among dual users.

Next steps
Triangulate findings with in-depth qualitative data to understand participants' perspectives on dual use behaviour.



Dual use to vaping only: Case study of change from EMA to FU



Quote 2: What changed since sort of May, when we left you, for you not to smoke at all?

I've got a nice new e-cig and I've got a half marathon coming up next month so I've just been really trying to focus[...] It is all mind over matter.

Quote 1: If I was at work, there'd be a girl sometimes I'd meet within sort of the smoking bit and I used an E cigarette but she smoked cigarettes. There might be days where she'd go do you want a cig? And I'd go "oh yeah, why not?"