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Loot boxes and gambling-related harms: Investigating the “gateway hypothesis”

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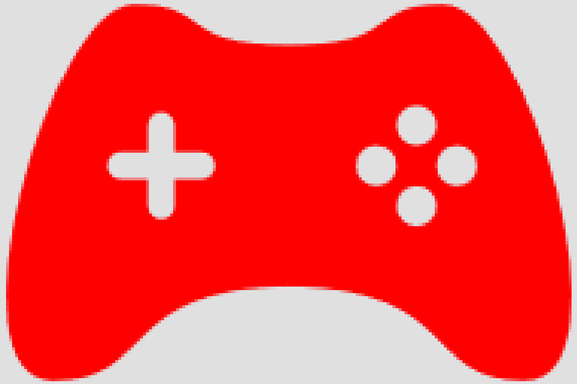
Background: Videogaming



- Hugely popular pastime (Newzoo, 2021; Zendle et al., 2019)
- Associated with many positive outcomes (Snodgrass et al. (2019); Formosa et al. (2022); Yilmaz & Griffiths (2023))
- But there are risks of harm, including risky in-game features (Zendle et al., 2019)
- Harms may be particularly prevalent amongst vulnerable groups, e.g. children / those with mental health conditions / additional learning needs (e.g. Ostinelli et al., 2021)
- Minimising risk is important to enable people to engage safely with games and enjoy the benefits without negative effects

What are loot boxes & why study them?

- Many games now include paid, gambling-like features (Zendle et al., 2019)
- ‘Loot boxes’; purchasable virtual containers whose contents vary randomly in value, have attracted particular attention (Drummond et al., 2020)
- Their mechanics mimic gambling in many ways (Drummond & Sauer, 2018)
- They are bought more often by people with symptoms of gaming disorder and/or gambling harms (Spicer et al., 2021)
- Fears they act as a causal ‘gateway’ to gambling harms are harder to substantiate (Spicer et al., 2022)

Method overview

Retrospective self-report; online (Prolific Academic) survey of 1102 UK adults who both gamble and buy loot boxes (ID'd via 'pre-screen')

Key measures included:

- Problem gambling severity index (PGSI (Ferris & Wynne, 2001)).
- Gambling-related cognitions (GRCS (Raylu & Oei, 2004)).
- Internet Gaming Disorder scale (IGD-SF9 (Pontes & Griffiths, 2015)).
- Risky loot box index (RLI (Brooks & Clark, 2019)).
- Barratt impulsivity scale (BIS-Brief (Patton, Stanford, & Barratt, 1995)).
- Income; spend (gambling and loot boxes); demographics

“Gateway” research question (within survey)

Does buying loot boxes causally influence gambling involvement (and/or vice versa)?

- Aim was to gain some insight into causality in a cross-sectional survey
- Asked participants what age they were when they first bought loot boxes, and what age when they first gambled.
- Asked whether (and if so, *how*) one had influenced the other.
- Asked (via free-text boxes) for perceived reasons

“Did purchasing loot boxes, in your opinion, contribute to your decision to start gambling?”

Analysis

- Quantitative statistical analyses conducted using both Bayesian and frequentist methods

- Quantitative content analysis of free-text responses (reasons for migration from one activity to the other)
  - Emergent coding scheme
  - Inter-coder reliability average k = 0.91

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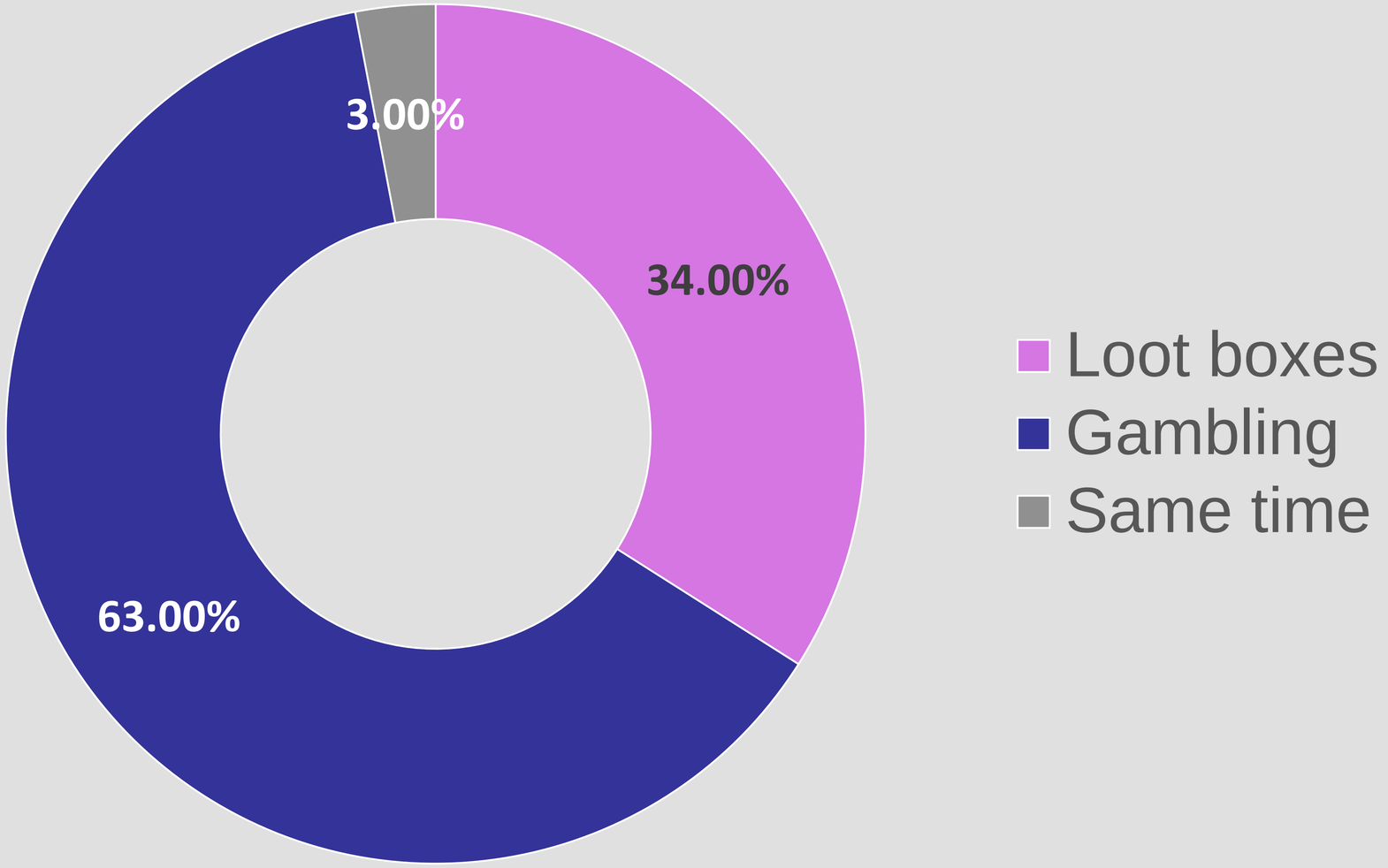
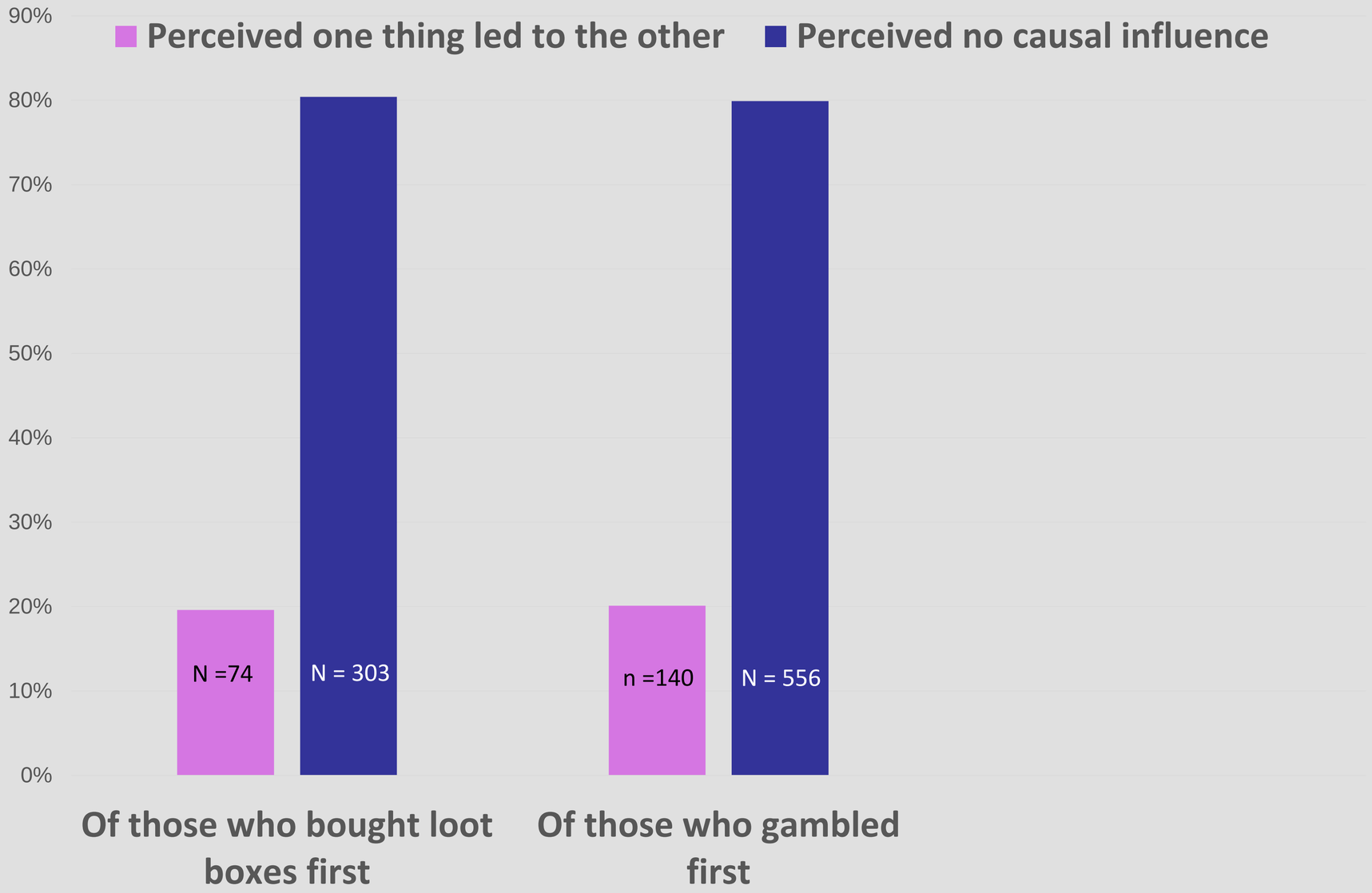
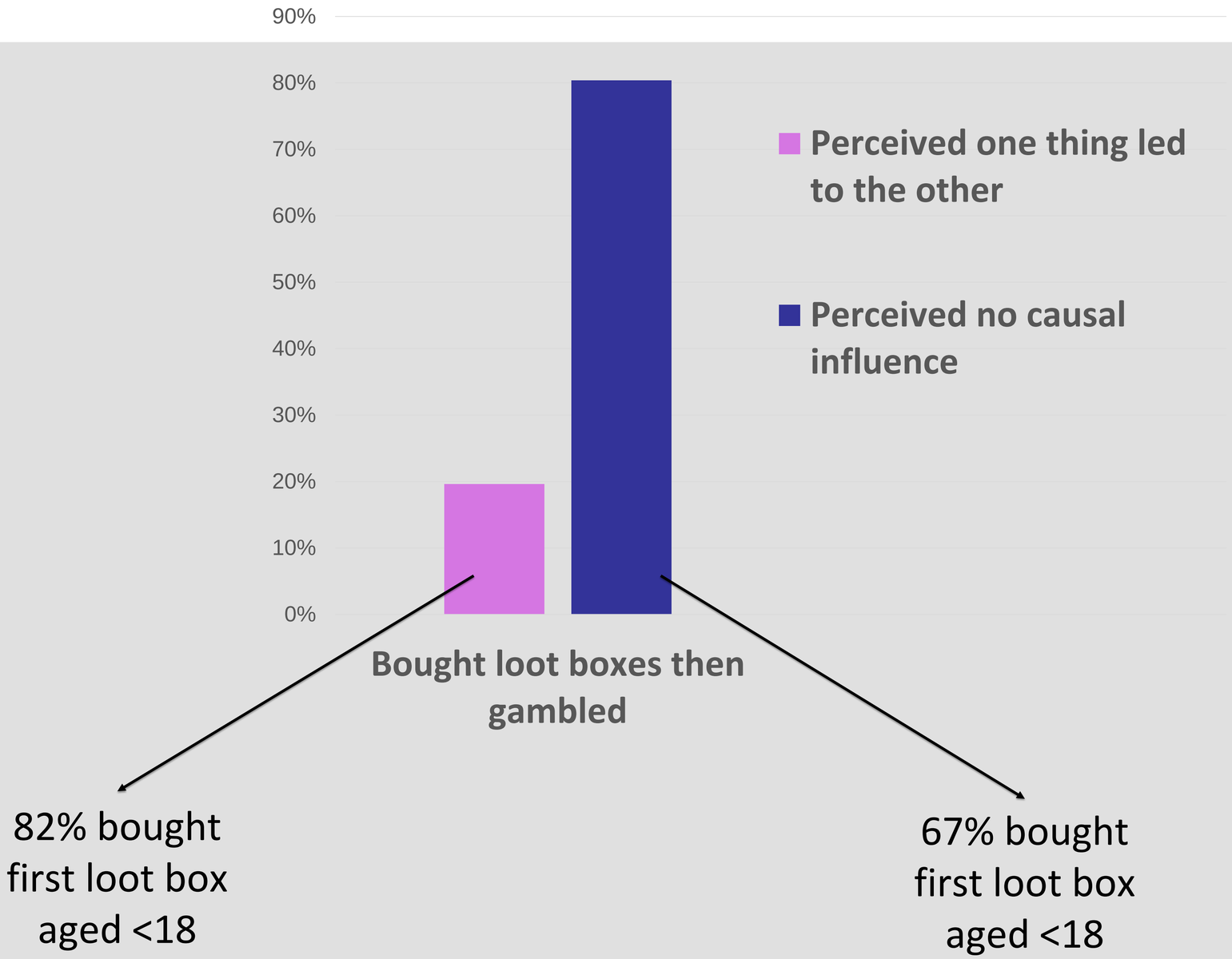
Results: What came first; gambling or loot boxes? (n= 1102)



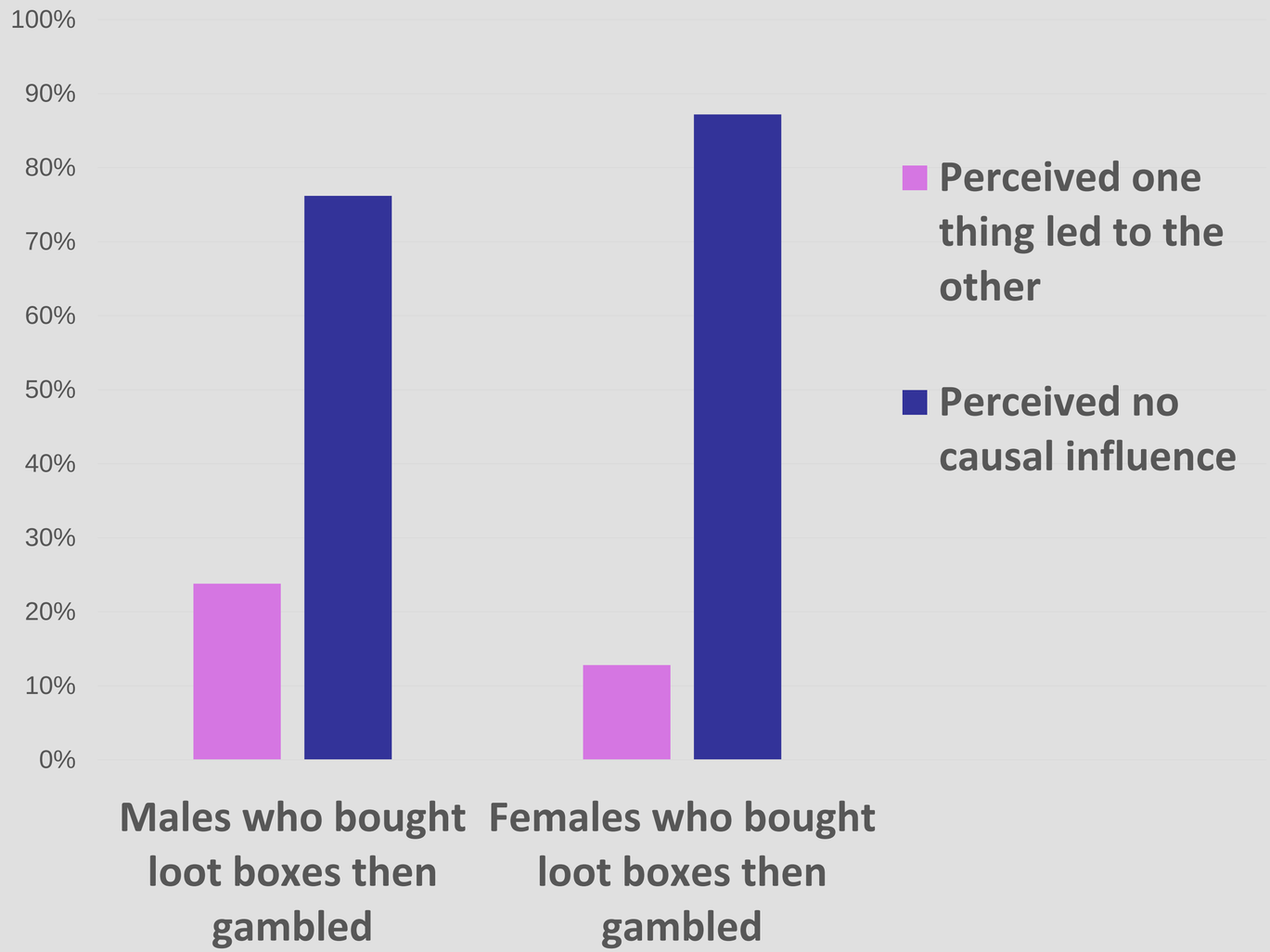
Perceptions of causal links



Age of first exposure to loot boxes and likelihood of reporting a gateway effect



Gender and likelihood of reporting a gateway effect



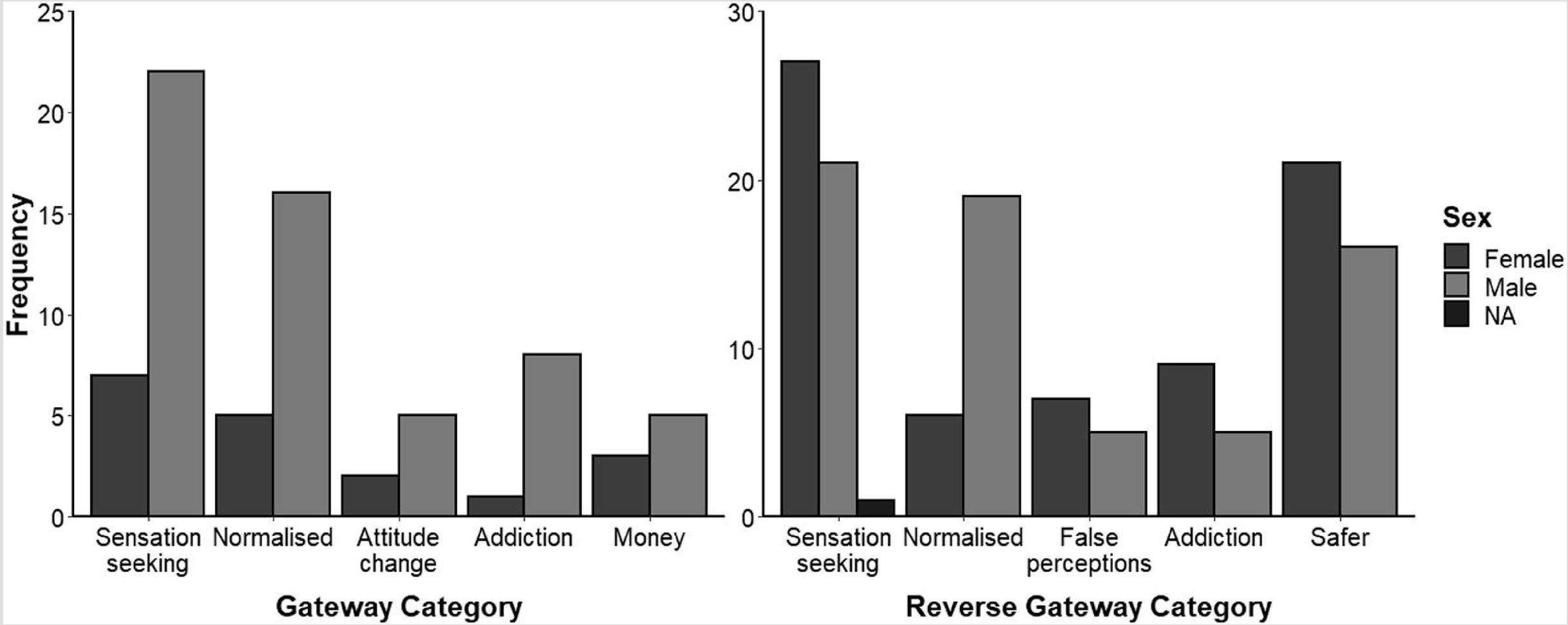
Content analysis codes: why people felt loot boxes had influenced them to begin gambling

Gateway	
1. Sensation-seeking	Replicating thrill, excitement, adrenaline rush of loot boxes in a different format
2. Normalised	Transitioned to gambling because it has similar characteristics to loot boxes. It has become normalised/routine
3. Attitude change	Using loot boxes has altered attitudes/perceptions, e.g. no harm had come from loot boxes so assumed same would be the case in gambling
4. Addiction	Loot boxes were considered addictive and gambling is another outlet to satisfy that addiction
5. Money	Moved on to gambling to make 'real' money
6. Unable to determine/other	None of the above

Content analysis codes: why people felt gambling had influenced them to begin buying loot boxes

Reverse gateway	
1. Sensation-seeking	Replicating thrill, excitement, adrenaline rush of gambling in a different format
2. Normalised	Transitioned to loot boxes because it has similar characteristics to gambling. It has become normalised/ routine
3. False perceptions	Gambling has created false perceptions, e.g. success in gambling is presumed to carry over to loot boxes.
4. Addiction	Gambling was considered addictive and loot boxes are another outlet to satisfy that addiction
5. Safer	Transitioned to loot boxes as they are considered a 'safer' form of gambling, e.g. easier to control/limit spending
6. Unable to determine/other	None of the above

Frequency of different reasons for transitioning from one activity to another



Between-group comparisons (of those who did/did not report a gateway effect)

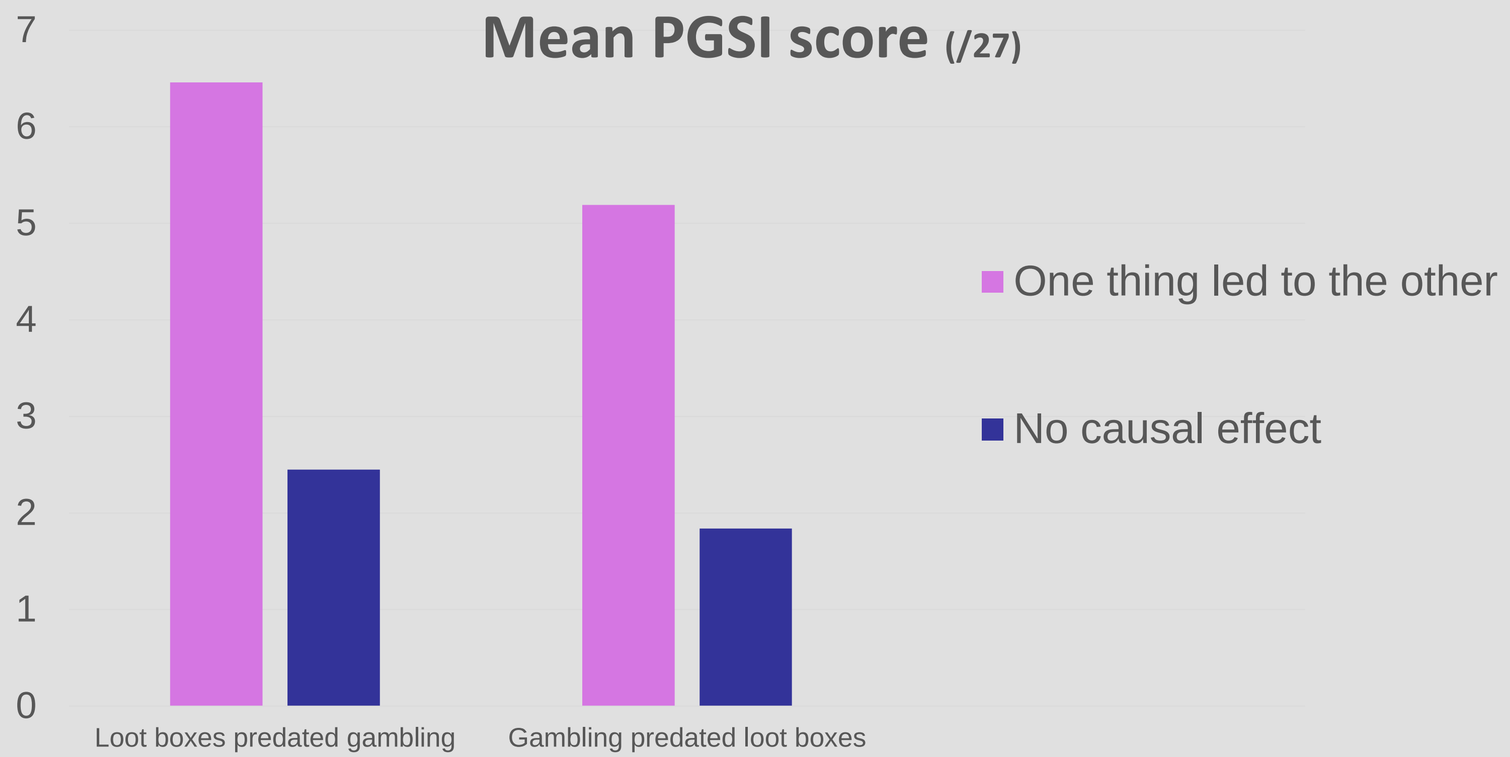
Those reporting a ‘gateway’ (in either direction) had significantly*…

Higher gambling related cognitions (GRCS) scores
Higher PGSI (gambling harms) scores
Higher problem gaming (IGD) scores
Higher risky loot box index (RLI) scores
Higher impulsivity (BISB) scores
Higher spend on gambling

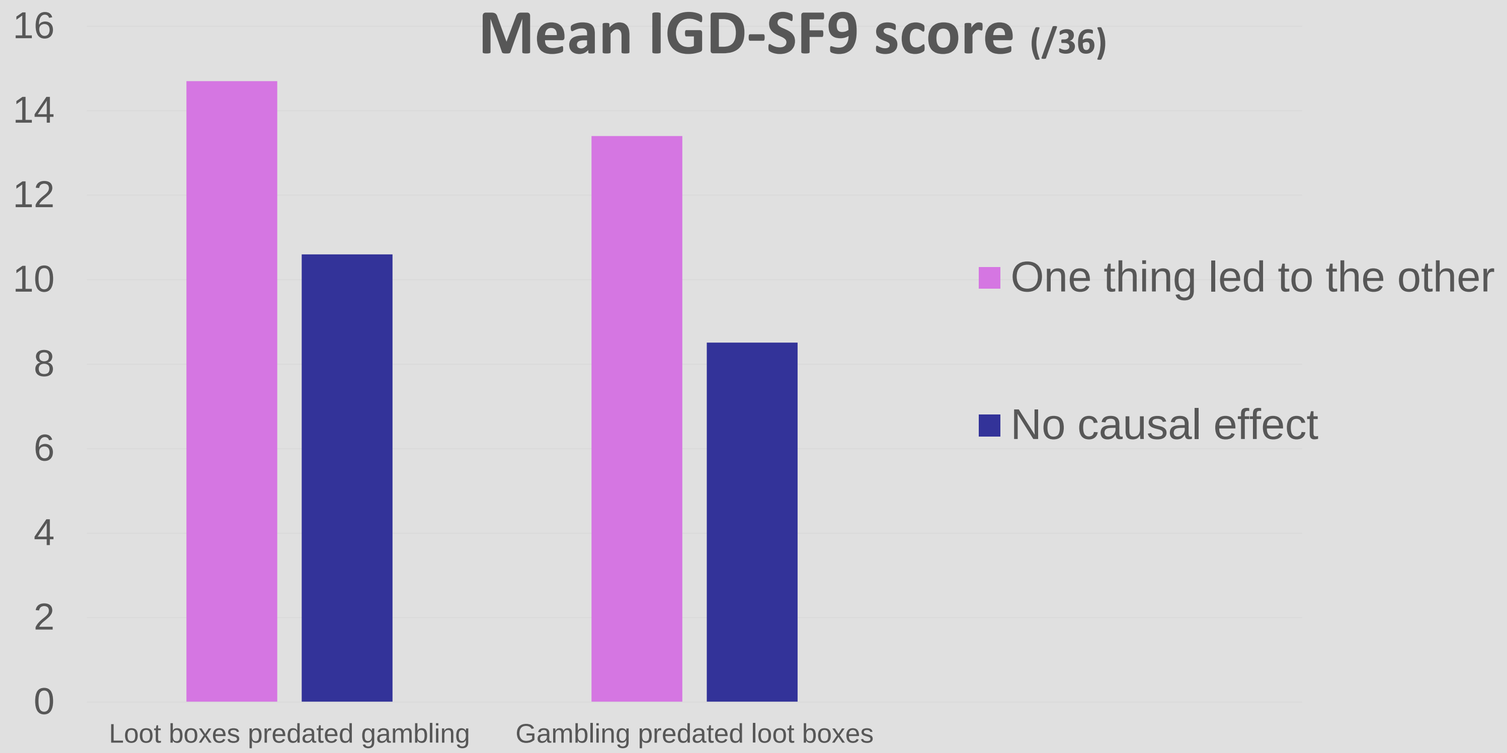
(*when compared with those not reporting a gateway, via both frequentist & Bayesian statistical analysis.)

Gambling related cognition scale (GRCS) score by order of engagement in activity and perceived causality

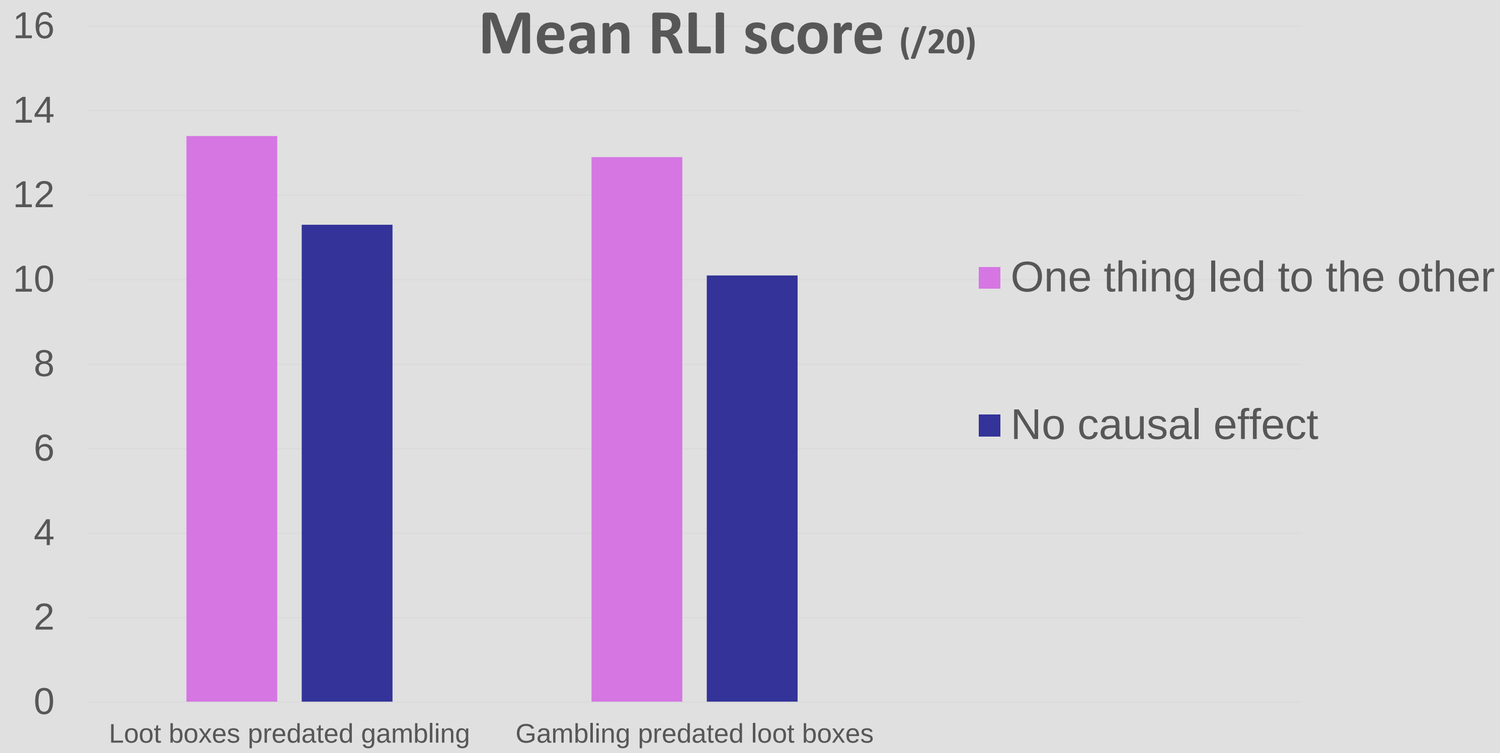
Gambling harms (PGSI) score by order of engagement in activity and perceived causality



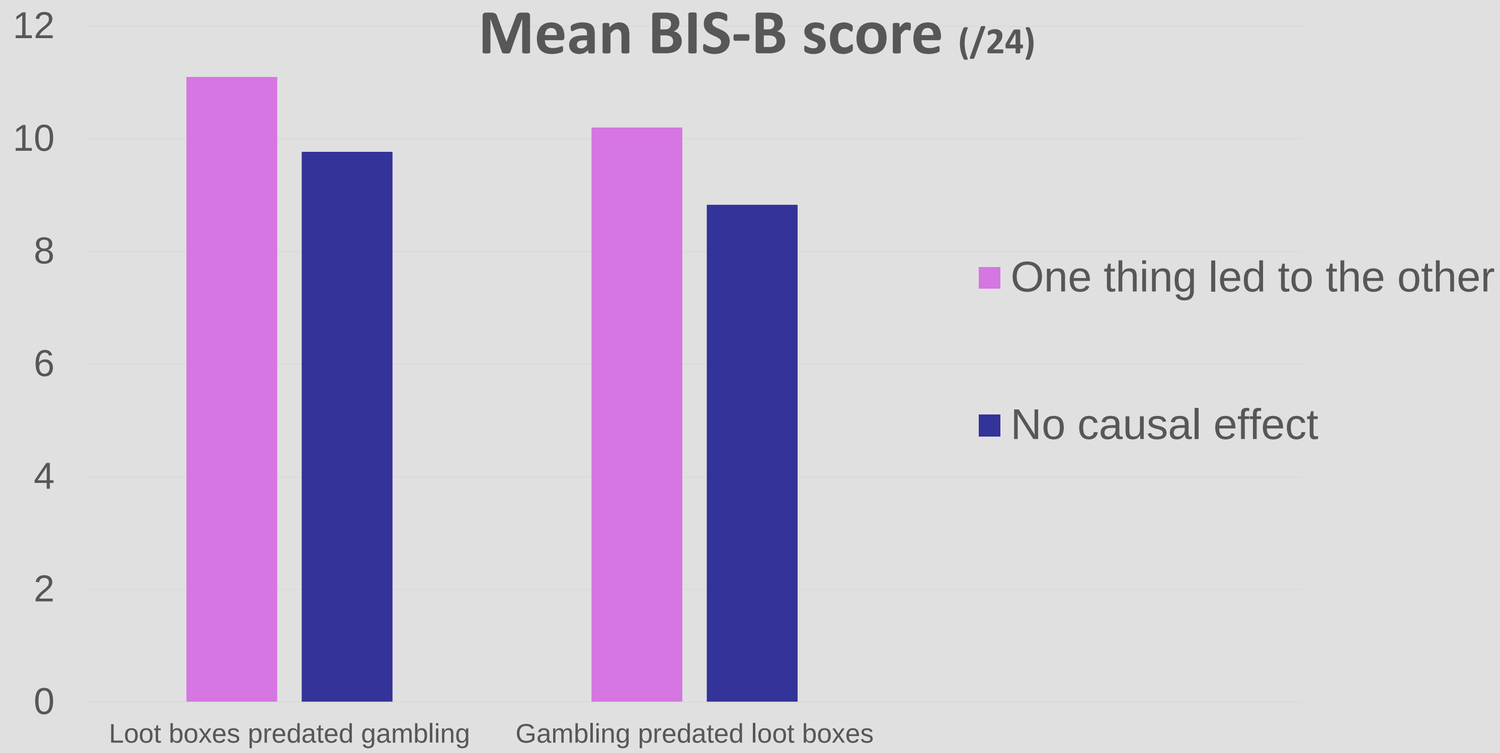
Internet gaming disorder (IGD-SF9) score by order of engagement in activity and perceived causality



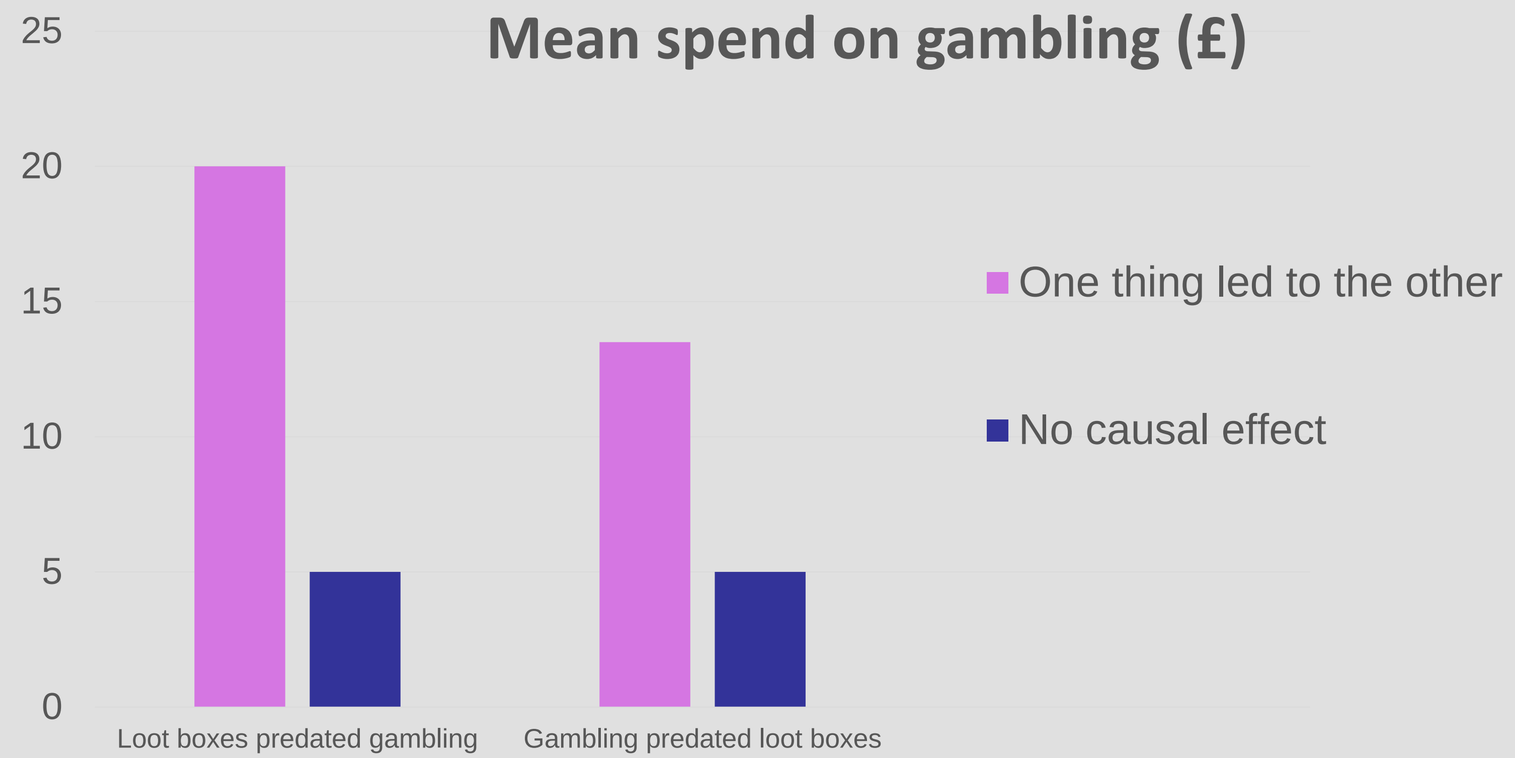
Risky loot box inventory (RLI) score by order of engagement in activity and perceived causality



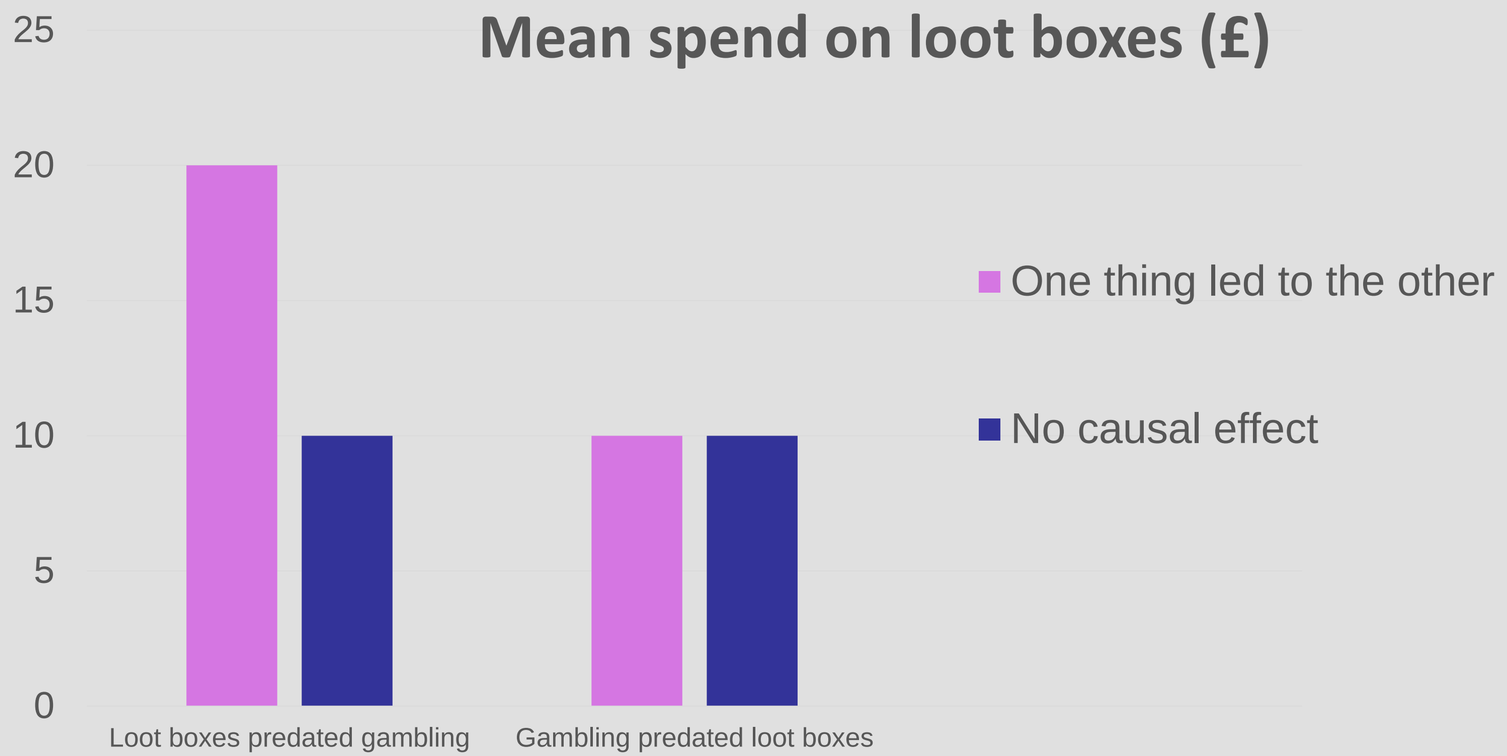
Impulsiveness (BIS-B) score by order of engagement in activity and perceived causality



Gambling spend by order of engagement in activity and perceived causality



Loot box spend by order of engagement in activity and perceived causality



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[Loot boxes and problem gambling: Investigating the “gateway hypothesis” – ScienceDirect]

[OSF | Gateway Paper Open Resources]

Group	Gateway	Loot boxes first Avg	Sig	Gambled first Avg	Sig
PGSI (P3) (0-27)	Yes	6.46	$p < .001$ $BF = 1.10x10^{9}$ $d = .92$	5.19	$p < .001$ $BF = 2.19x10^{15}$ $d = .85$
	No	2.45		1.84	
GRCS (P4) (0-138)	Yes	43.8	$p < .001$ $BF = 1.65x10^{6}$ $d = .77$	42.0	$p < .001$ $BF = 1.57x10^{19}$ $d = .95$
	No	27.7		23.4	
IGD (P5) (0-36)	Yes	14.7	$P < .001$ $BF = 1.95x10^{3}$ $d = .59$	13.4	$p < .001$ $BF = 1.04x10^{11}$ $d = .73$
	No	10.6		8.51	
RLI (P6) (0-20)	Yes	13.4	$p < .001$ $BF = 5.21x10^{2}$ $d = .54$	12.9	$p < .001$ $BF = 1.79x10^{10}$ $d = .70$
	No	11.3		10.1	
BISB (P7) (0-24)	Yes	11.1	$p = .007$ $BF = 3.40$ $d = .34$	10.2	$p < .002$ $BF = 27.16$ $d = .32$
	No	9.77		8.83	
Loot Box Spend (P8) (£)	Yes	20	$p = .001$ $BF = 55.70$ (UT = .29) $d = .46$ (UT = .16)	10	$p = .022$ $BF = 1.49$ (UT = .83) $d = .22$ (UT = .20)
	No	10		10	
Gambling Spend (P9) (£)	Yes	20	$p < .001$ $BF = 3.66x10^{2}$ (UT = .14) $d = .53$ (UT = .02)	13.5	$p < .001$ $BF = 86.75$ (UT = .11) $d = .35$ (UT = .01)
	No	5		5	
Income (P10) (£)	Yes	1204	$p = .202$ $BF = .28$ $d = .16$	1882	$p = .055$ $BF = 1.24$ $d = .21$
	No	1388		2169	

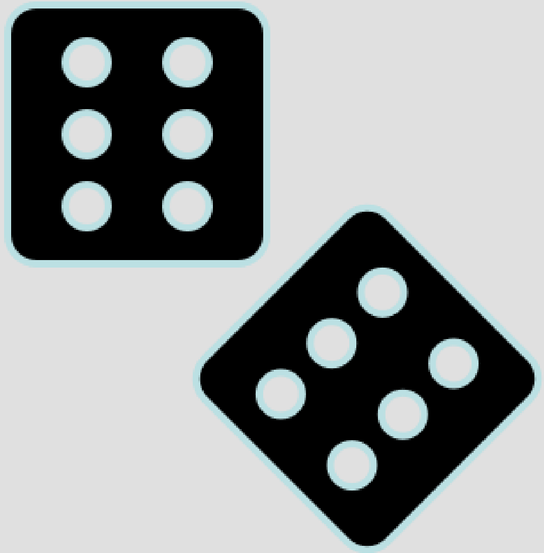
Conclusions

Variety of perceived mechanisms via which buying loot boxes encourages people try gambling, and vice versa.

Includes individual traits (sensation-seeking), and external factors (normalisation of gambling-like behaviours).

Those migrating from one activity to the other appear be at greater risk of harm.

Some migrate from gambling to loot boxes because they are perceived as safer



Implications/ Applications

Sensation seeking as a motive for loot boxes/ gambling may be a useful ‘red flag’ to look out for.

Knowledge about factors driving migration could start to inform education/interventions strategies (e.g. reducing ‘normalisation’ of gambling via loot boxes is a priority).

Preliminary evidence that loot boxes can causally influence some to try gambling – contributes to the case for legislation

Limitations / future directions

Accuracy of recall of what influenced behaviour likely to be imperfect

- Memory biases / cognitive distortions
- Variable level of insight into motivations / influences
- Potential post-hoc rationalisation of behaviour

Further work using longitudinal observational studies, diary studies, or lab-based studies would all be valuable to help understand this process of ‘migration’ from one risky behaviour to another

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