

Report

How are bots changing buyer behavior?

NETACEA

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Introduction

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Principal Analyst, Osterman Research

Cyber attacks are predominantly understood through a dehumanized, technical, lens.

Precious little is understood about how the actions of threat actors affect people. This needs to change.

By hyper-scaling illegal actions and cynical self-interest, malicious bots arguably have a wider and more personal impact on Internet users than any other attack type. The problem has developed so rapidly that industry understanding is sorely lacking.

For this reason, this research seeks to understand the impact of scalper bots on internet users. Able to sidestep traditional controls, these malicious automations persistently target popular online events to hoard in-demand goods and services for personal gain. From the shadows, attackers

have used them to amass everything from driving tests and sanitiser during COVID, to concert tickets and sneakers. Their actions have even been the subject of US Congressional hearings and UK Prime Minister's Questions.

While the collective outcry of the enraged consumers is loud enough to put scalper bots in the spotlight during high-profile events, their corrosive effect on individuals over time is unclear. Are people aware of the problem? How are scalper bots driving shifts in consumer behavior? Who is responsible for addressing the problem? Does the power to drive change lie with the people?

This research strives to answer these questions by understanding the behaviors and opinions of the victims—internet users. Hopefully, with more insight, the industry can begin to chart a course towards change.

We surveyed

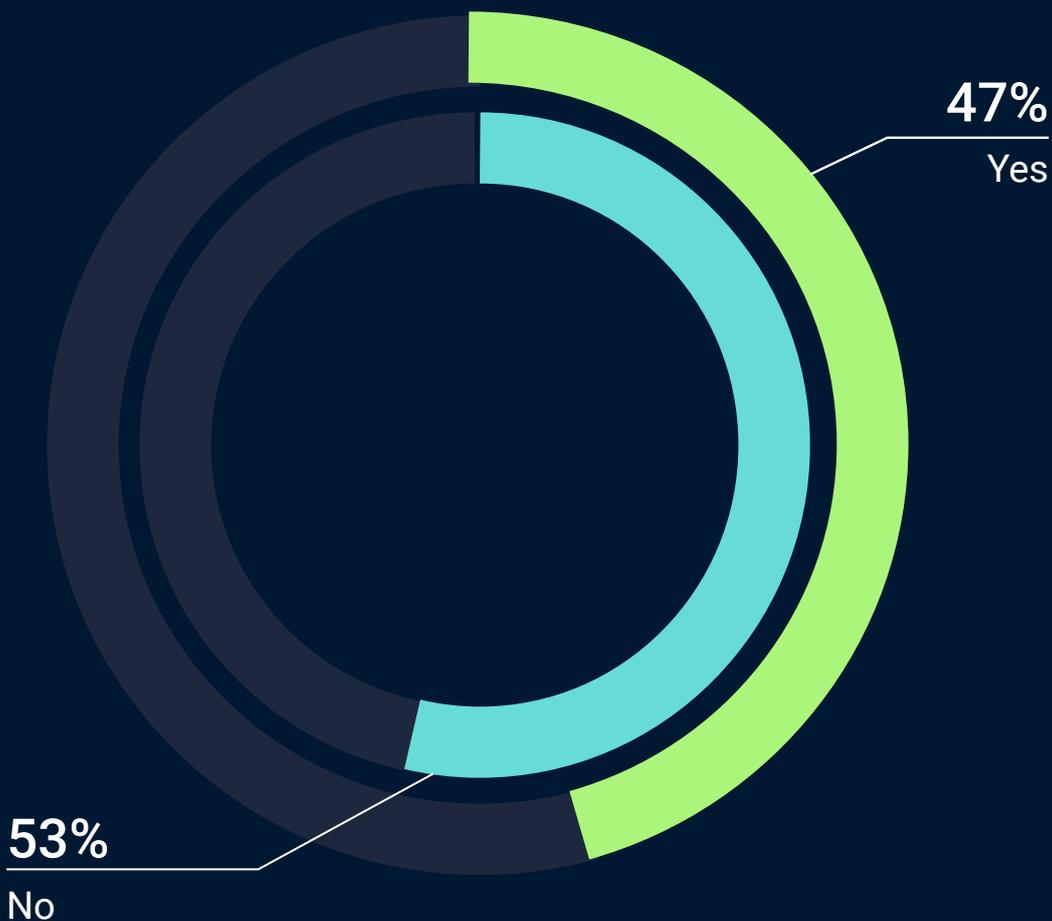
- 1000 people
- Aged 18+
- Across every US state
- Who spent \$500+ online in the last 12 months on popular goods and services

The data

Beaten to the punch by scalper bots

The analysis uncovered that almost half of Americans think they are competing with bots when buying goods and services online. When asked, 47% said they have been unable to buy what they wanted because of suspected bot activity.

Have you been unable to purchase what you want online because of what you suspect was bot activity?

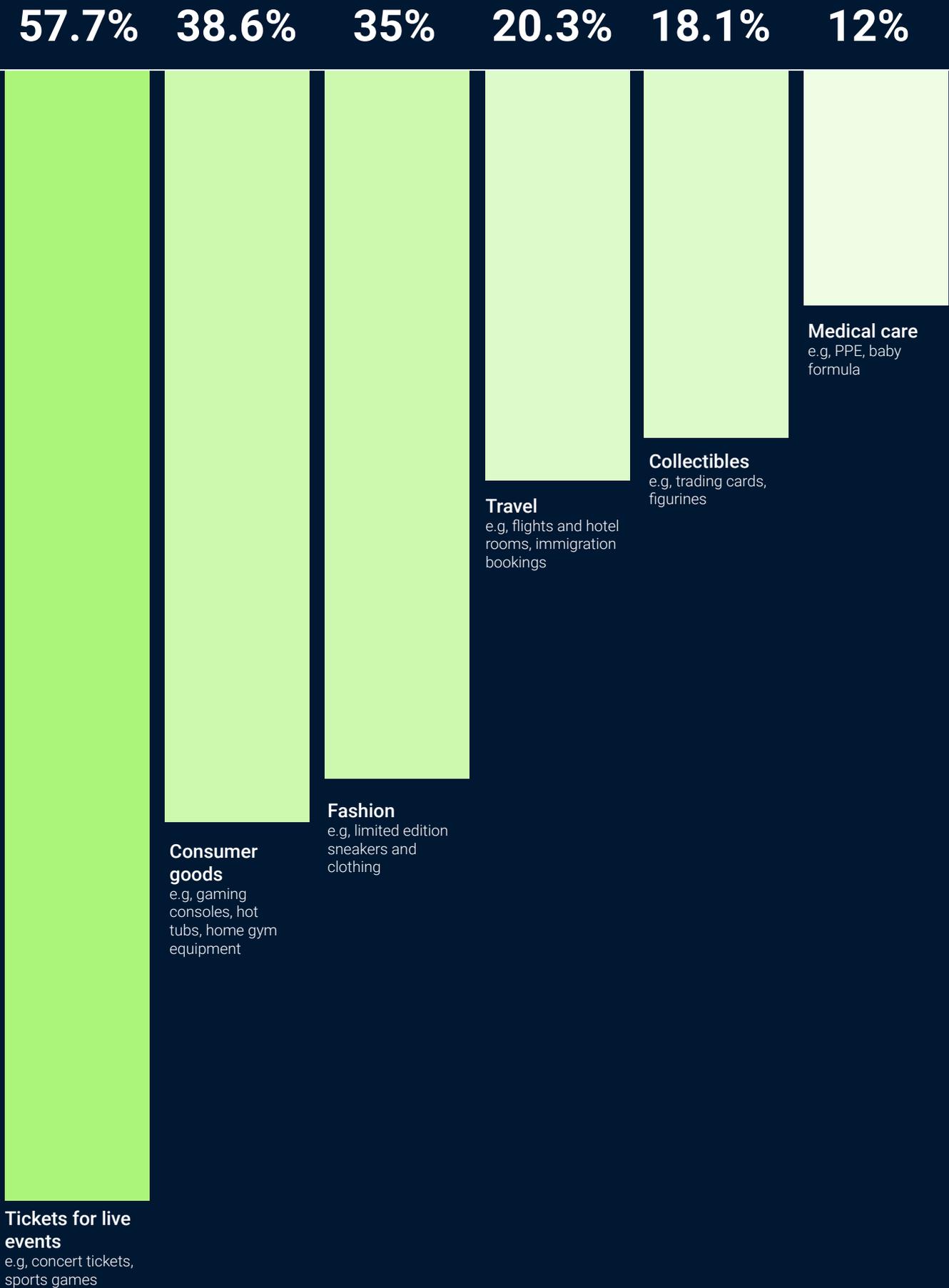


Of all respondents, by far the largest number affected are sports and music fans—58% of whom say they think bots are beating them to the punch while trying to buy tickets for concerts and matches. With online concert ticket sales alone in the hundreds of millions, and a Government Accountability Office report finding markups in excess of 40%, the amount of money funneling from consumer, to scalper bot owner, is huge.

This aligns with the findings consistently reported in Netacea's Scalper Bot Index. In Q1 2023, for example, the Index found Eurovision Song Contest tickets, with a retail value ranging from \$35 - \$450, being resold for \$13,000. People are paying more than 300x the recommended retail price, all of which goes straight into the scalper's pocket.

While scalper activity surrounding big-ticket events is frequently reported in the media, they are not the only targets. Consumer goods shoppers (38%) and fashion fans (35%) also felt bots stopped them acquiring their desired goods. Interestingly, one in five who suspected bot activity were trying to buy holidays and a worrying one in eight felt they were prevented from accessing medical care as a result of scalpers.

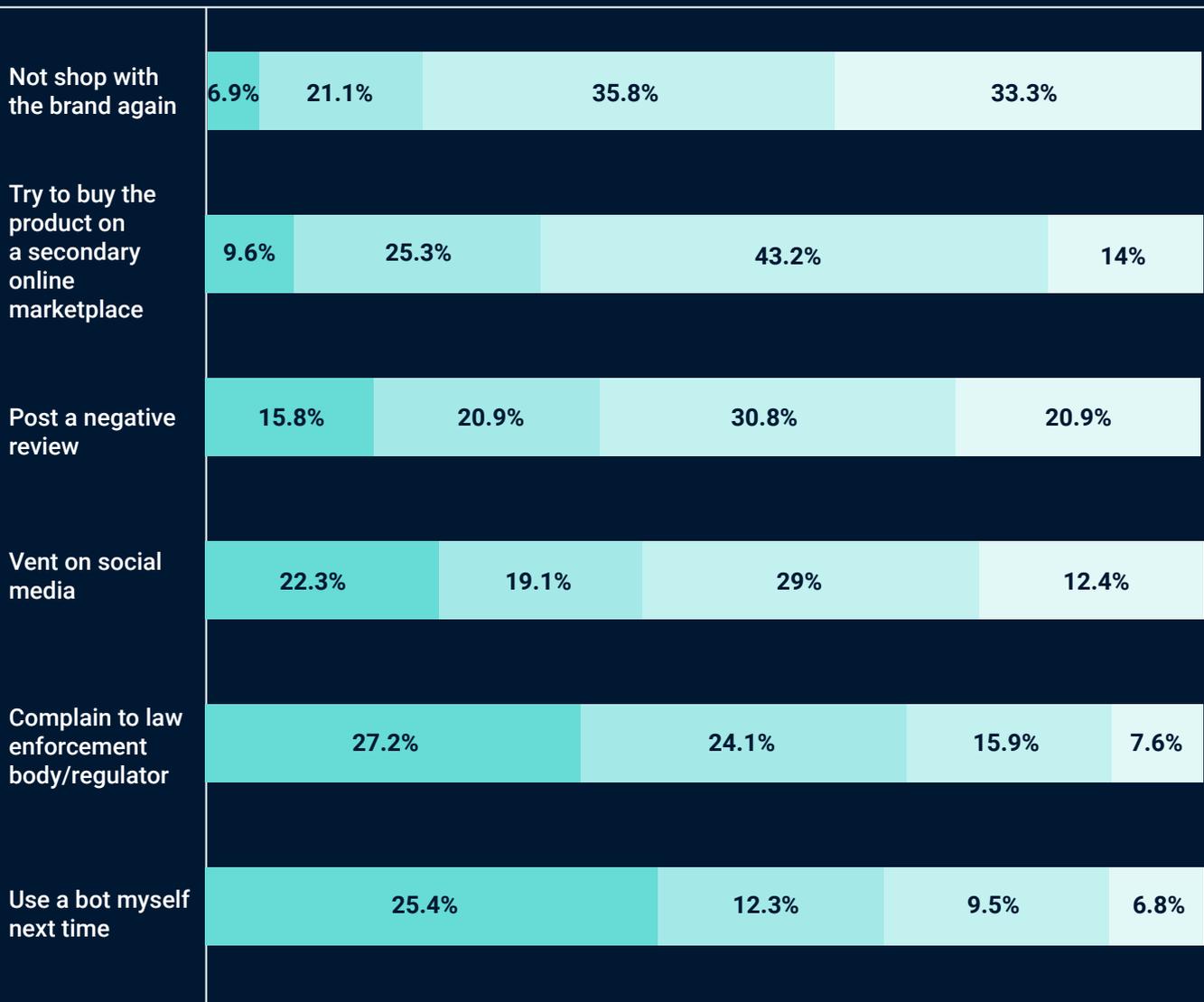
Goods and services commonly associated with suspected scalper bot activity



Source: Osterman Research (2023)

Playing into the hands of bot operators

How do people react to losing out to scalper bots?

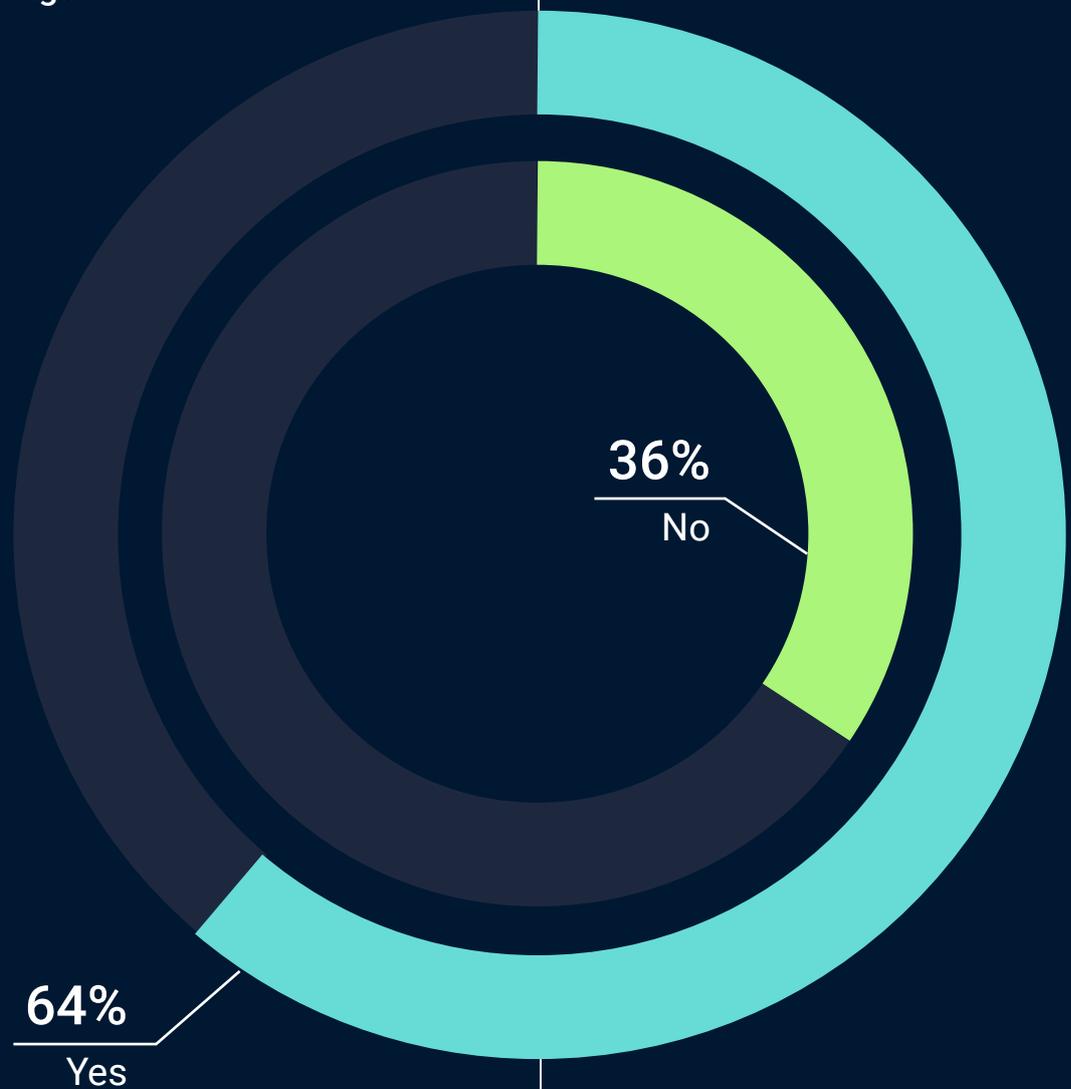


- Unlikely
- Neutral
- Likely
- Extremely likely

The results reveal that while most Americans are frustrated by scalping, they are more likely to pay an inflated price to a scalper so they can get hold of their desired products (57%) than leave a negative review of the primary seller online (52%) or complain to a regulator about the incident (23%). This only serves to profit the scalpers to the detriment of retailers and their customers.

This digital lethargy has real-world consequences. In the last 12 months alone, 64% of those asked said they had paid more elsewhere - such as secondary marketplaces - because of online stock shortages. Subsequently, the problem is perpetuated as scalpers have more money to invest in acquiring stock.

In the last 12 months, have you paid a higher price online for goods and services because of shortages?



Source: Osterman Research (2023)

Inflation busting mark-ups

When confronted by a scalper holding goods and services to ransom, nearly half of those surveyed (48.8%) say they would be willing to pay an inflated price to get what they wanted.

On average, people are willing to pay scalpers a mark-up of 13.2%. To put this in context, 'real world' consumer price inflation in the US has only surpassed this figure twice in the last 100 years:

- 1 In 1947, the recession following World War 2 led to hyperinflation.
- 2 In 1980, a spike in the cost of oil triggered a severe recession.

In short, scalpers are driving consumers to pay higher rates of inflation than they experienced at the height of national recession. When broken down by specific goods - people are willing to stomach the highest levels of bot-driven inflation for event tickets, 14.2%, and medicine, at an eye watering average of 17.2% - more than quadruple the current Consumer Price Index on medical commodities. At the high end of the scale, 7% of people are willing to pay double - or more - if a bot is hoarding the goods they want.

On average, how much are people willing to spend above RRP?

Medicine	17.20%
Event tickets	14.20%
Baby formula	14%
Travel tickets	13.60%
Electronic goods	13.30%
Food	13.20%
Sneakers	12.60%
In game items	11.80%
Software products	11.40%
Commemorative items	10.60%

Recent Yeezy drop: Slide Onyx

RRP

\$70

Aftermarket price

\$188

Markup Average

168%

Taylor Swift Eras Tour Tickets

RRP

\$49 - \$449

Aftermarket price

**\$338 -
\$31,000**

Markup Average

4719%

PlayStation[®]5

RRP

\$500

Aftermarket price

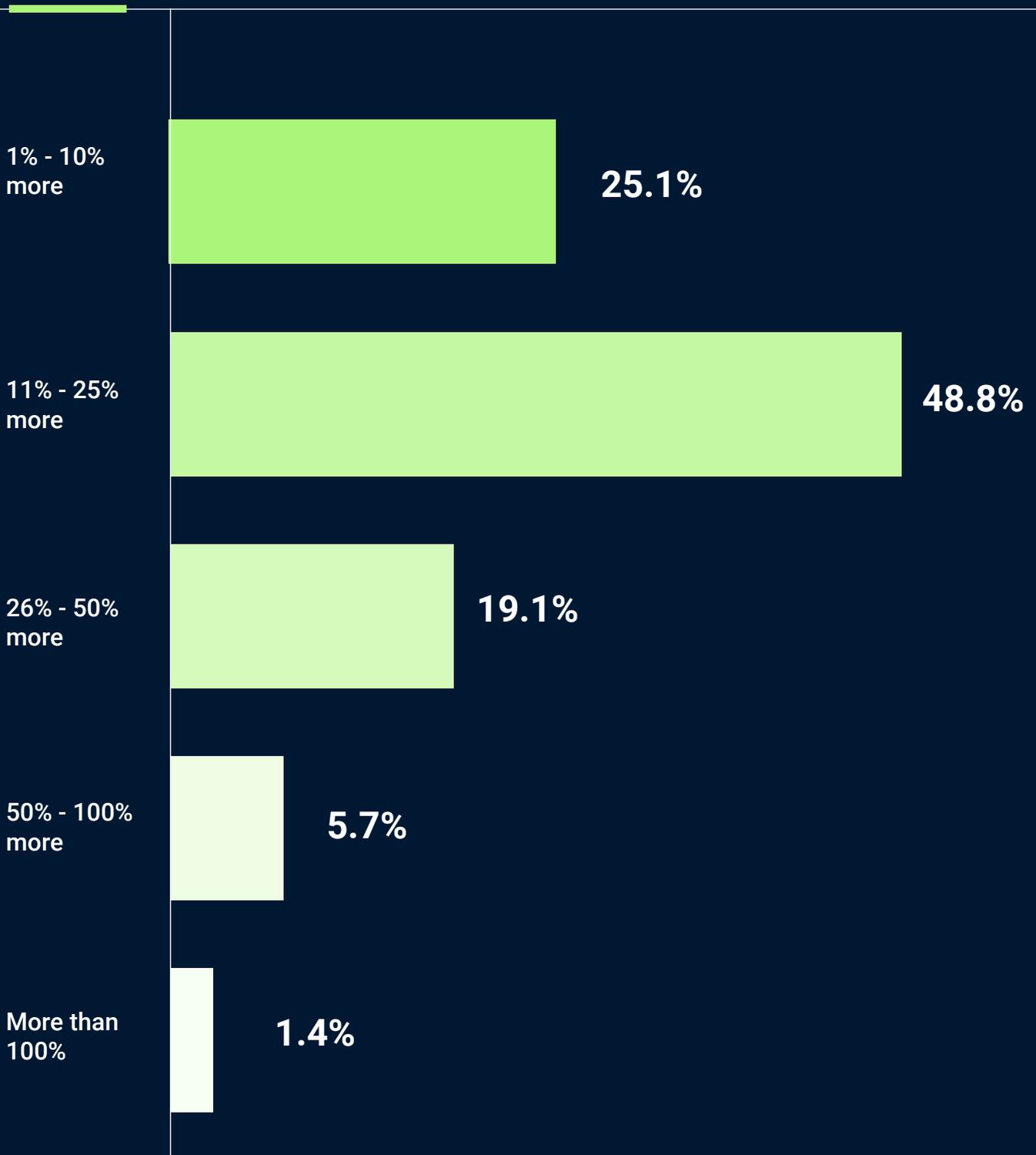
\$549 - \$644

Markup Average

19%

Consumers say they are paying over the odds for items on secondary markets. Nearly half say they have paid up to a quarter more, one in five up to a half more and 6% of people were even willing to pay up to 100% more.

In the last 12 months, have you paid more for an item due to stock shortages?

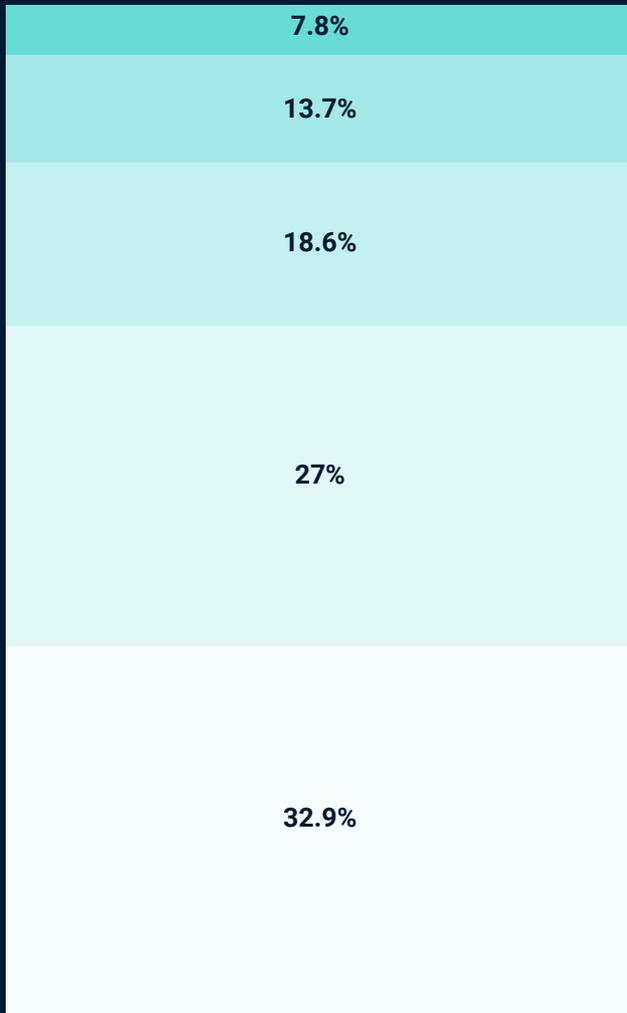


Fear of criminal exposure

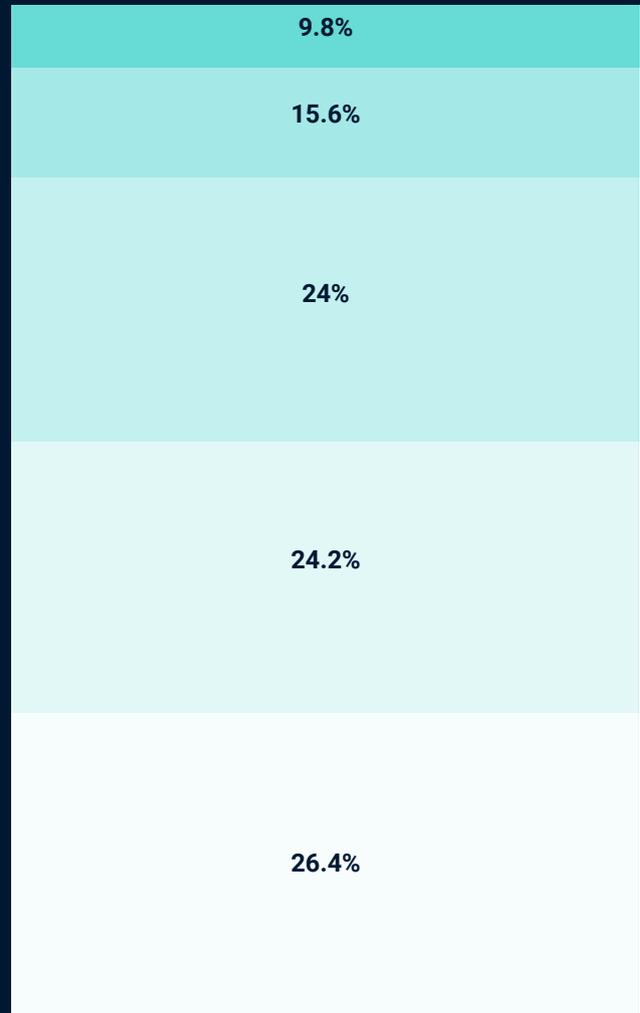
What are your greatest concerns when purchasing from secondary marketplaces to overcome stock shortages?

- Extremely concerned
- Moderately concerned
- Somewhat concerned
- Slightly concerned
- Not at all concerned

Purchasing a fake product or service



Having my payment details stolen



Buying scalped items from secondary marketplaces also exposes consumers to risks. Not only are prices inflated, but 91% of consumers worry their payment details may be stolen, whilst 92% fear the items might be fake. These concerns are even greater when buying from social media sites, where 95% of people worry their payment details could be stolen. Yet, this hasn't stopped consumers from buying desired items through unofficial channels.



Bec McKeown

Cyber Psychologist and Founder of Mind Science

A lot of decision-making factors are at play as people convince themselves to undertake a known risky action such as buying from scalpers. Personal situation, demographic, and attitude towards scams set a baseline. This is influenced by subjective beliefs - how the individual perceives things - and normative beliefs - how other people's perceptions influence behaviors.

For instance, if you're 18 years old, live in a small town and want a driving license to access work, you are highly motivated to learn to drive. This is subjective. Combine this with the normative belief that everyone around you has a driving license and expects you to have one too, and it compels you to get a driving license. If no slots are left, as they have all been taken by scalpers, these factors will have a huge bearing on the individual taking a risky and potentially unethical route to secure a driving test.

This applies to unmissable music and sporting events, where there is a behavioral belief, often driven by social media, that everyone is going and so should you.

The desire to be part of the crowd supersedes normal behaviors. The approval of people important to you, whether it's Instagram followers or your group of friends in real life, can override rational behaviors. Norms, such as price, that would historically have stood in the way of you accessing your desired goods are removed, providing a big psychological driver to go and get those tickets. At this point, the chemicals produced in your brain are dictating. Consequences may come further down the line, but in the moment, people act without the usual checks and balances.

A gateway to unethical and illegal behavior

In the rush to get the goods they want online, many Americans fall into unethical online behavior themselves - with nearly 1 in 6 (17%) admitting they have resorted to using a bot in the last year. This was particularly marked amongst younger respondents. A quarter of bot users are in the 18-25 age bracket, compared to just 5% being over 65.

Percentage of bot users in the last 12 months* by age

24.2%

18 to 25 years of age

27.1%

26 to 35 years of age

20.8%

36 to 45 years of age

11.6%

46 to 55 years of age

6.5%

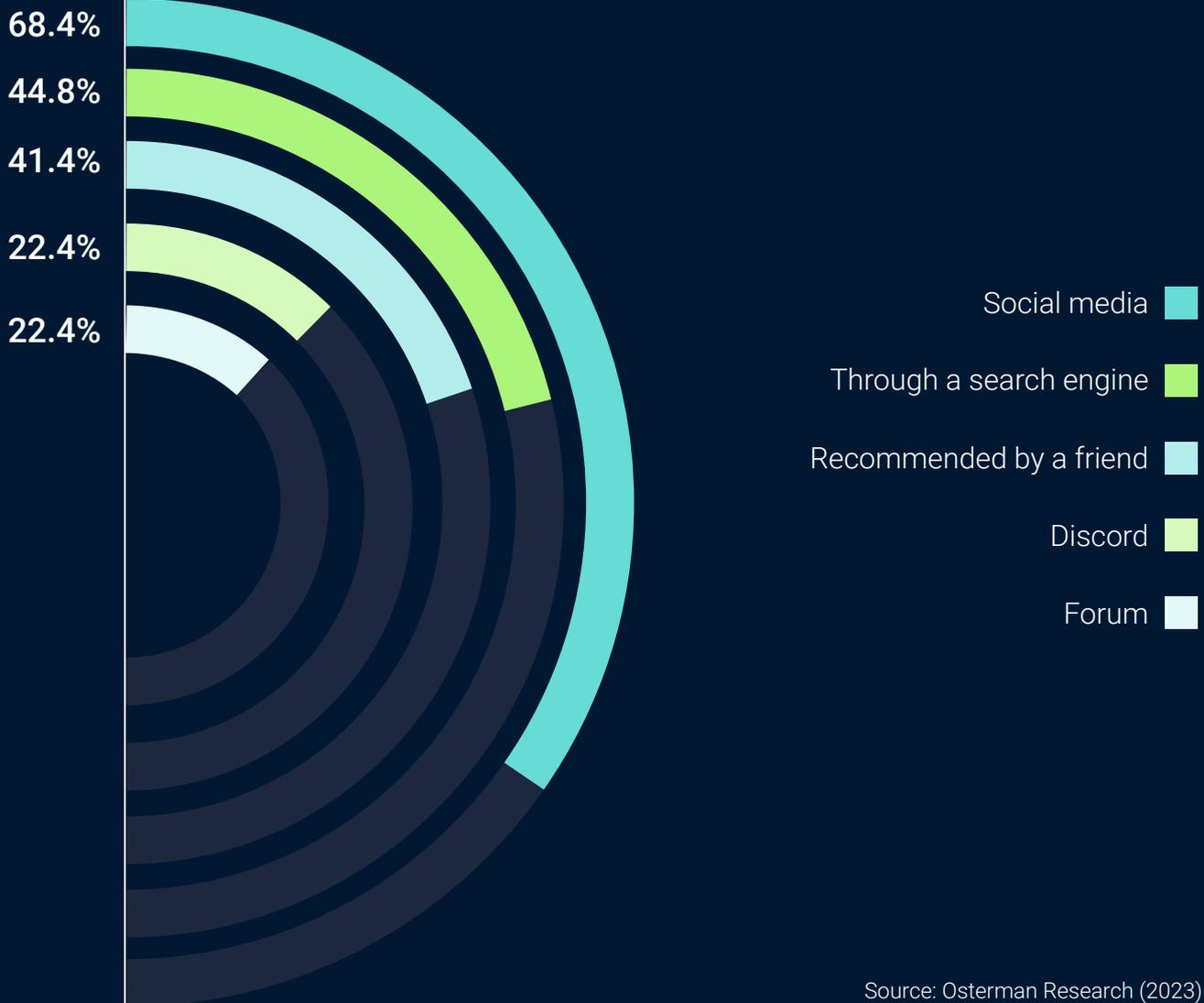
56 to 65 years of age

4.9%

Over 65 years

How are bots changing buyer behavior?

People are predominantly seeking bots for hire on social media, with nearly 70% finding them on these platforms and 41% being connected to a bot operator by a friend.



Despite it being illegal to scalp tickets using malicious automation, only 2% of Americans said they would definitely never use a bot. Alarmingly, 17% said they would be likely to risk the \$16,000 Federal Trade Commission fine for bulk-buying tickets for resale.

This is indicative of the vast sums of money available in the scalper economy; the profitability trumps the risk. The challenge is turning this reality on its head.

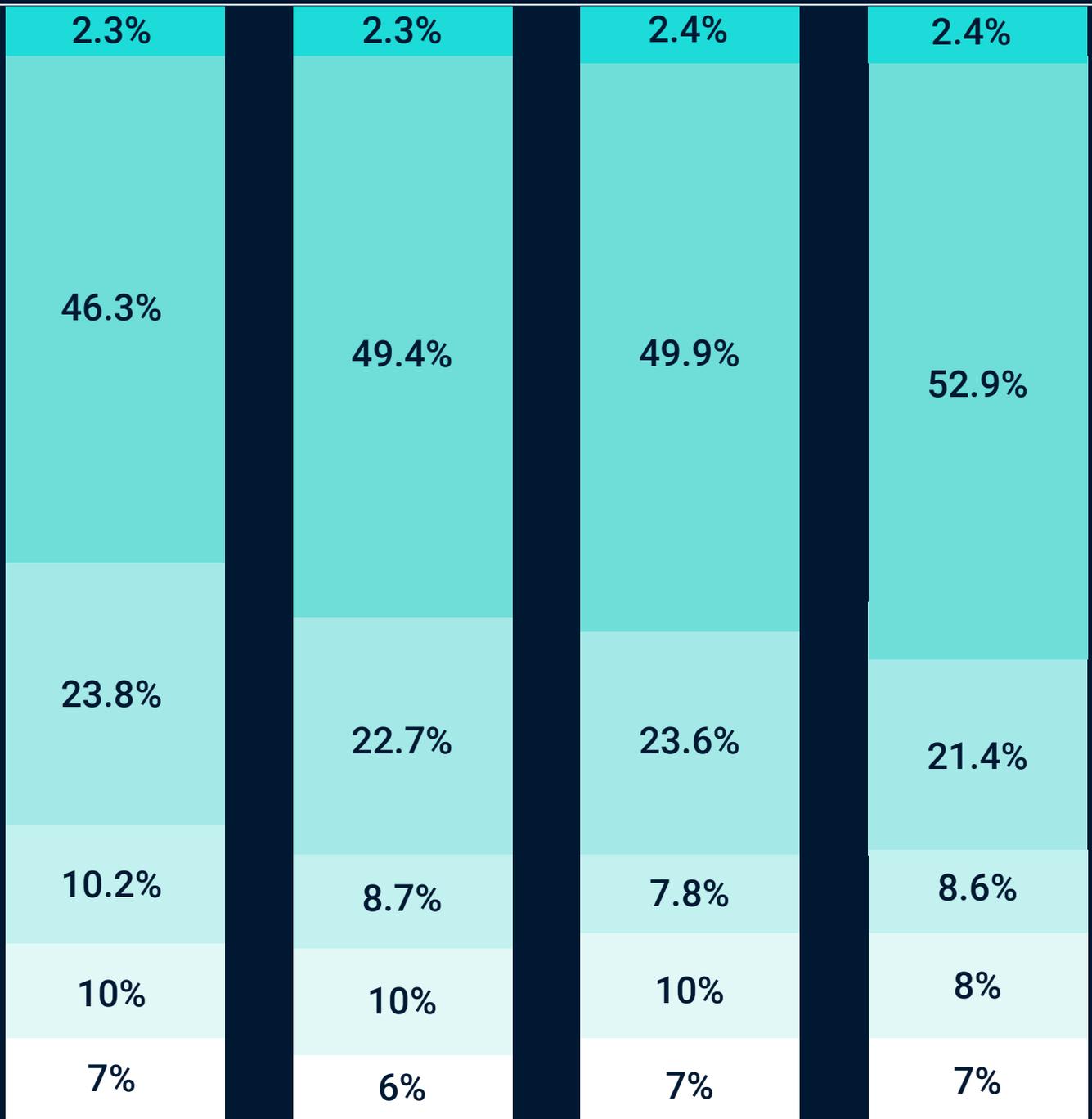
How likely are you to use bots to:

Buy goods or services for myself

Submit bids at the last minute to win an item

Buy popular goods or services in bulk to resell at a mark-up

Scrape information from websites to resell



Never Extremely unlikely Unlikely Neutral Likely Extremely likely



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Automation is now in mainstream public consciousness, and the barrier to entry for consumers has significantly lowered. Scalper bots, in particular, are also regularly acknowledged as a money-maker.

This creates the underlying conditions for confirmation bias in scalpers - a psychological phenomenon where new evidence only ever confirms existing theories. In essence, the bot users only ever see upside for their actions. They reason that no one will come to any harm, and that they are not directly responsible for causing harm because they are operating at a distance.

It's very easy for this to happen when mediated by the internet. Morals and principles go out of the window because the consequences aren't immediately apparent.



Cyril Noel-Tagoe

Principal Security Researcher, Netacea

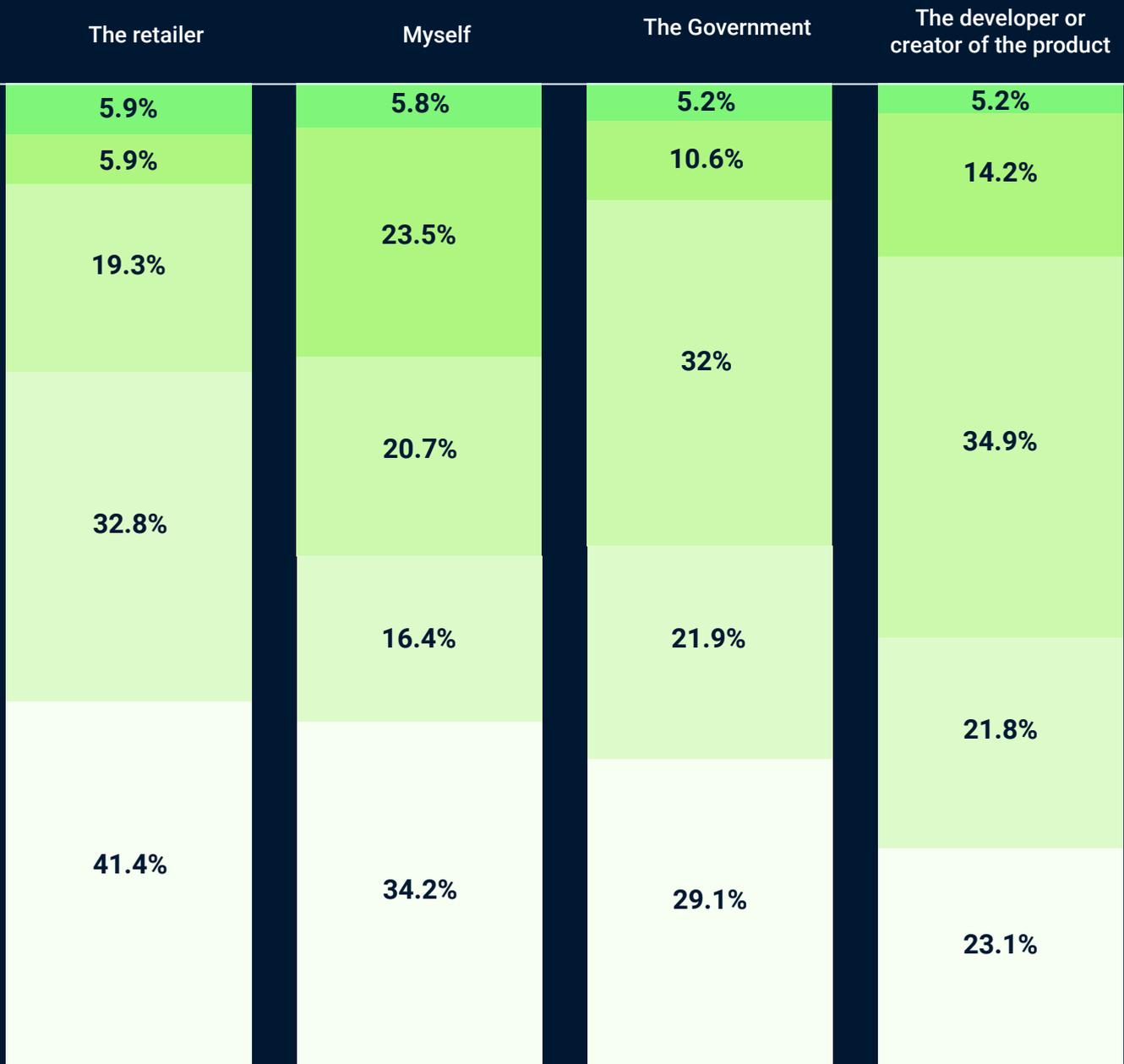
Scalper bot use raises many ethical and legal dilemmas. Most bot users would likely argue that bulk buying non-essentials such as sneakers and gaming consoles is merely capitalism in effect. But what about the growing trend of using bots to knowingly exploit pricing errors and bulk buy mispriced items? What about using bots to purchase high demand, low availability essentials (e.g., food or medical supplies) for profit, as some did during the baby formula shortage in 2022? What about the ones who capitalised on their bot's advantage to help their friendship groups obtain baby formula and didn't resell it for profit? Where does one draw the line? Is it legality?

Ticket and non-ticket scalping communities used to be reasonably disparate, since using bots to bulk buy tickets for resale is illegal in most western jurisdictions. But even these lines are blurring. Many sneaker and consumer goods scalping communities are increasingly supporting ticket scalping, as potential profit seems to outweigh prosecution risk. They might not advertise it in public, but behind closed doors, they are facilitating illegal ticket scalping. Those tempted to do so often don't even need to obtain additional tools. Many "sneaker" bots now include ticket scalping modules.

A call for action

What level of responsibility do you believe the following entities have for stopping scalper bots?

- Don't know
- Not at all responsible
- Somewhat responsible
- Mostly responsible
- Completely responsible



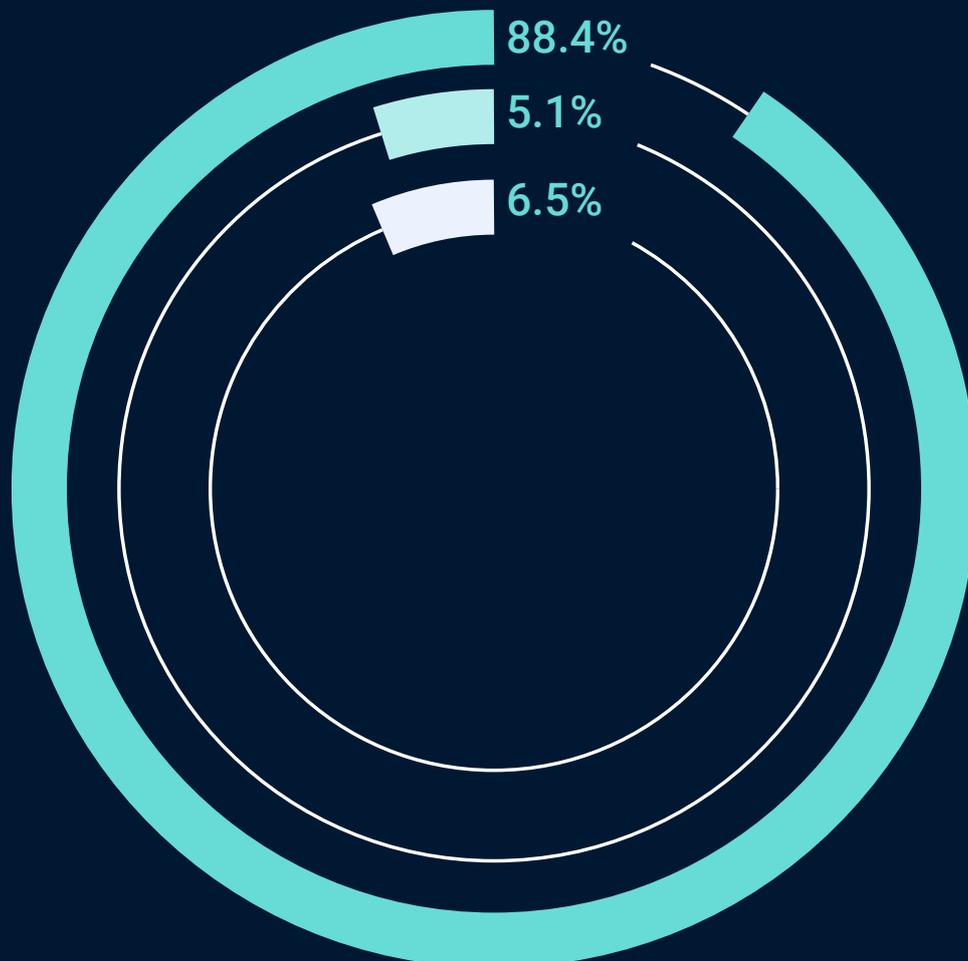
The vast majority of those affected expect retailers, product owners and Government to take some level of responsibility. Of those surveyed, 94% of online shoppers put responsibility for action with retailers, 83% hold the Government accountable and 80% believe the brands owning the product have a role to play.

How are bots changing buyer behavior?

88% of people say retailers should have technology in place to stop scalper bots and 82% believe Government regulation should clamp down on the use of scalper bots.

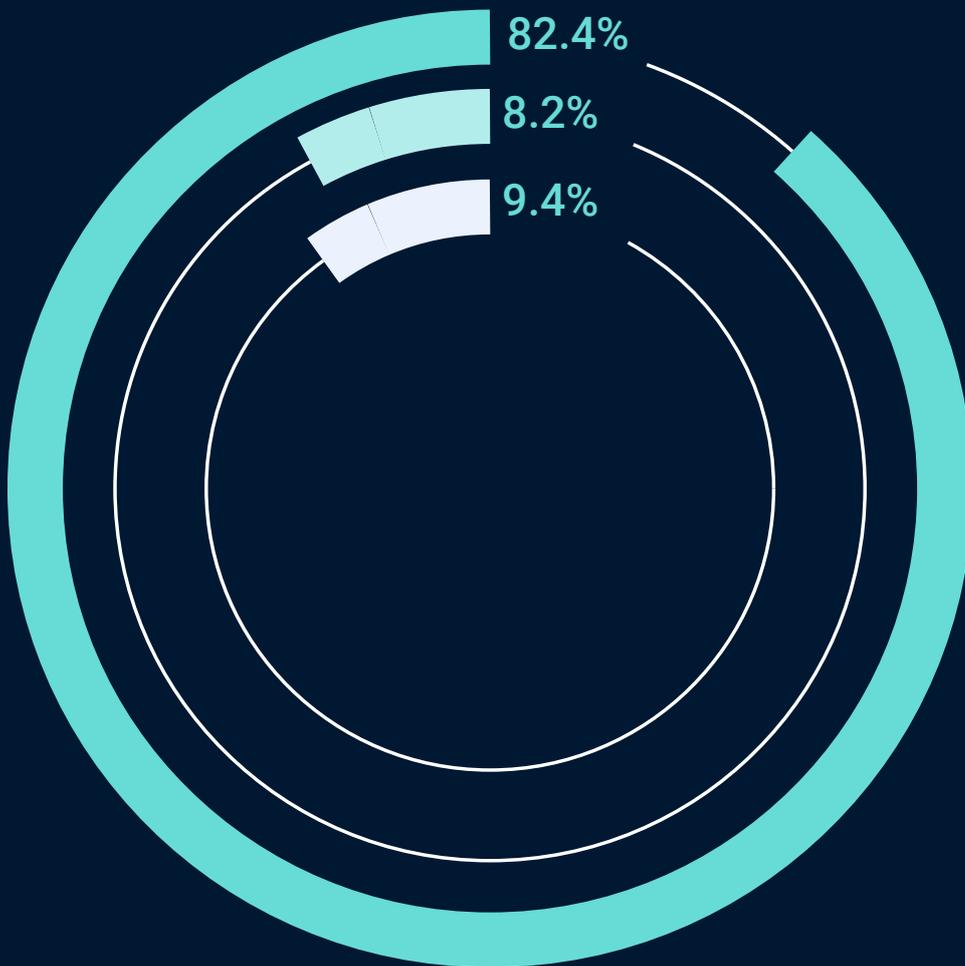
Who do you believe is responsible for stopping scalper bots?

Sellers should be able to stop or limit scalper bots



Agree Disagree Don't know

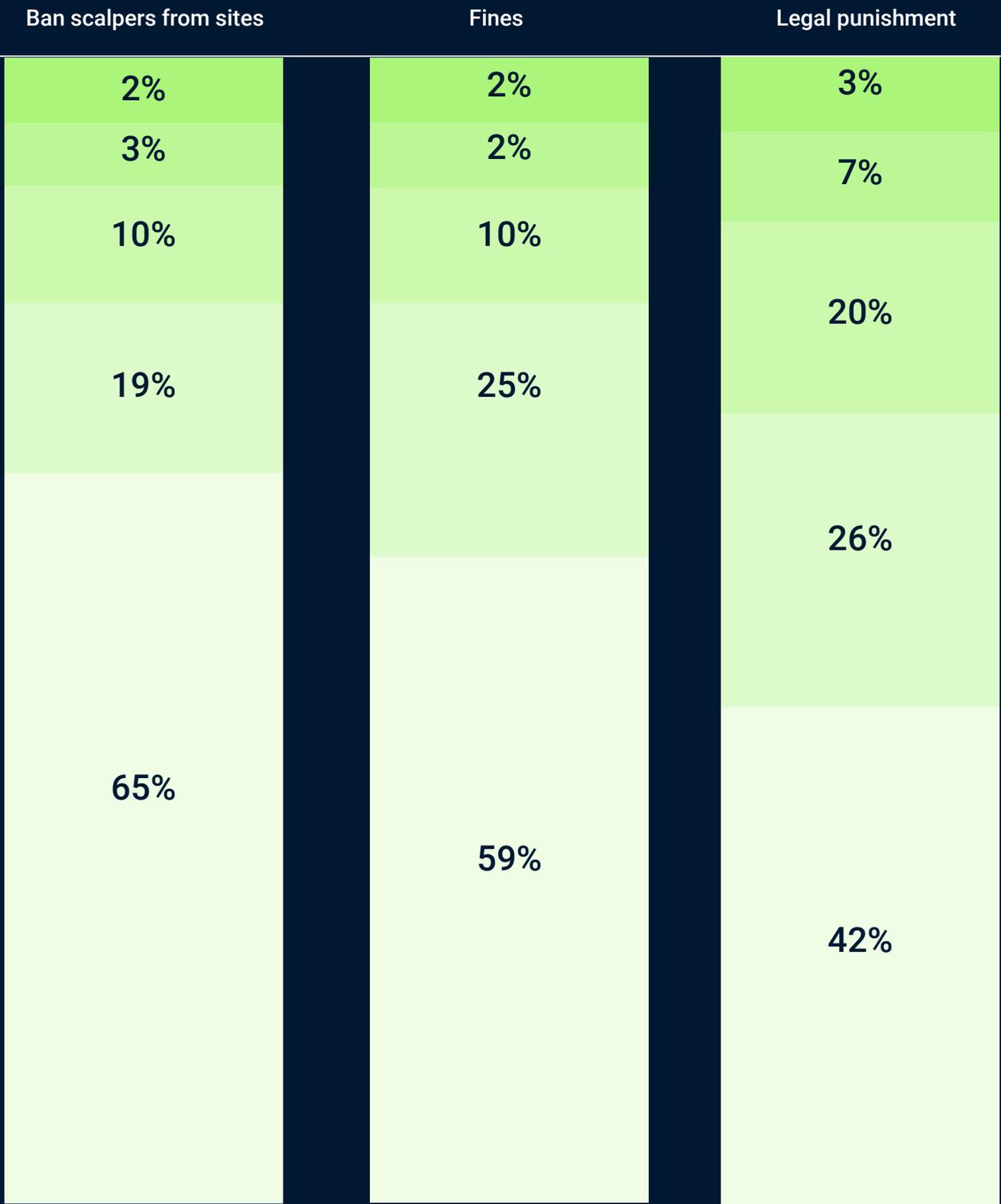
Government should stop, limit or regulate the use of scalper bots



■ Agree ■ Disagree ■ Don't know

In terms of punitive action, people lean strongly towards active measures. 68% back legal punishment for scalpers and 84% want fines and website bans.

Strongly oppose Somewhat oppose Neutral Somewhat favor Strongly favor





Andy Still

Co-Founder, Netacea

Prioritise people, not bots

The research offers a glimpse into the range of caustic effects scalper bots have on average Americans.

On an individual level, people end up at the mercy of scalpers charging exorbitant markups while simultaneously being forced to take uncomfortable personal risks with their data and finances online. A seemingly endless cycle of consumer harm funded by the victims themselves. A good portion even engage in illegal behavior themselves for profit, or simply to keep pace with the scammers.

However, the true damage lies in the hidden scale of this murky problem. Extrapolated across a US e-commerce market worth \$277bn per quarter, an incalculably huge number of people are exposed to financial and ethical harm. High-profile flash-points might make for good headlines and populist political policies, but the real impact of scalper bots accrues on the American public quietly over time. Every item scalped is a person affected.

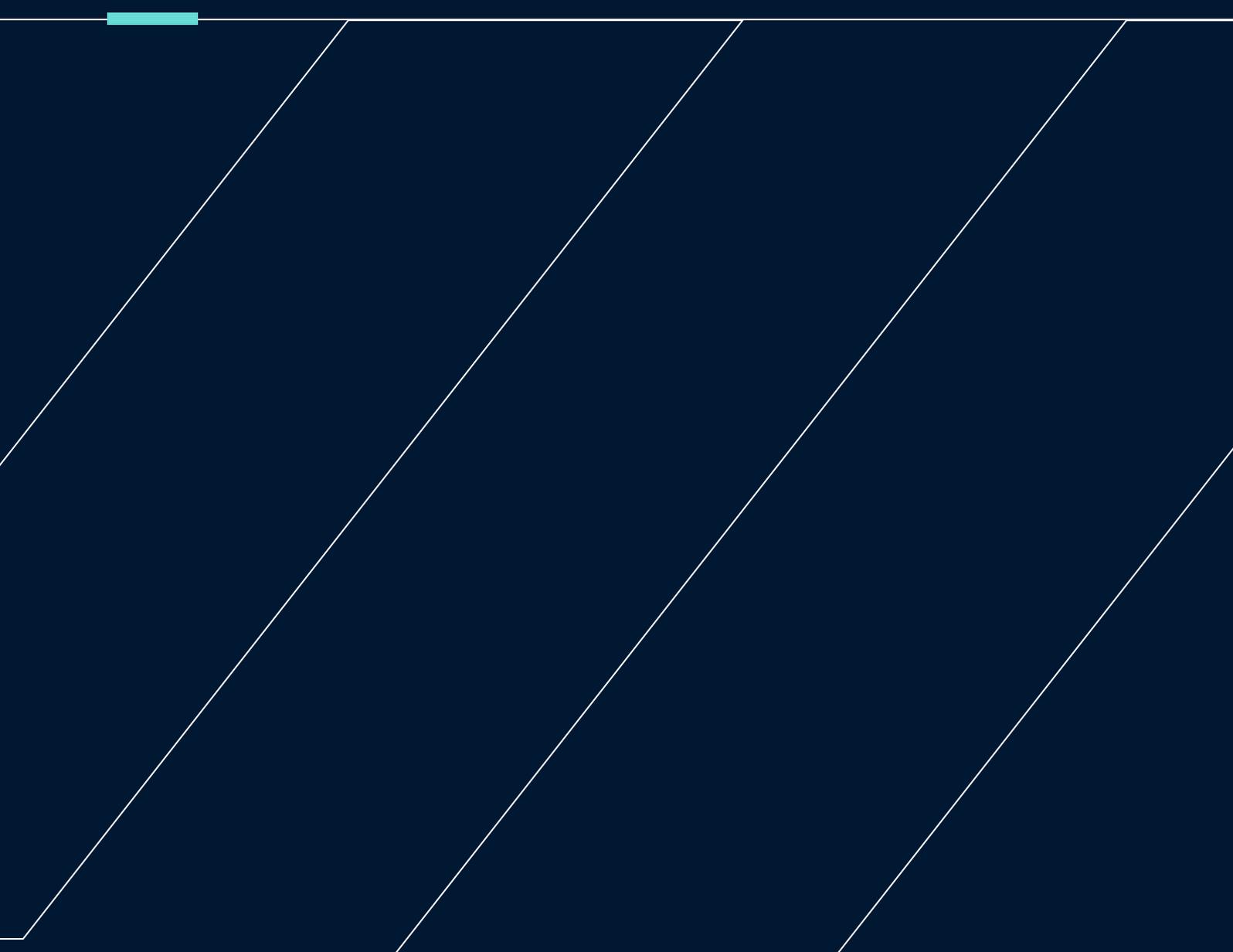
People are gradually waking up to this and expect action. They want to be protected by the brands they interact with. They expect policy from those they elect. Without this, eventually, they will vote with their feet. Ultimately, the status quo benefits no one but scalpers.

NETACEA

About Netacea

Netacea prevents sophisticated, high-volume, bot attacks that drain value from online businesses. Situated on the far edge of technical infrastructure, the platform combines unrivalled visibility of all traffic across APIs, applications and websites with evolved detection, response and threat intelligence capabilities. The result is more effective automated protection for highly trafficked businesses.

[Netacea.com](https://www.netacea.com)

A decorative graphic consisting of several parallel white lines that create a series of slanted rectangular shapes, extending from the top edge of the page down towards the bottom. The lines are evenly spaced and create a sense of depth and structure.