

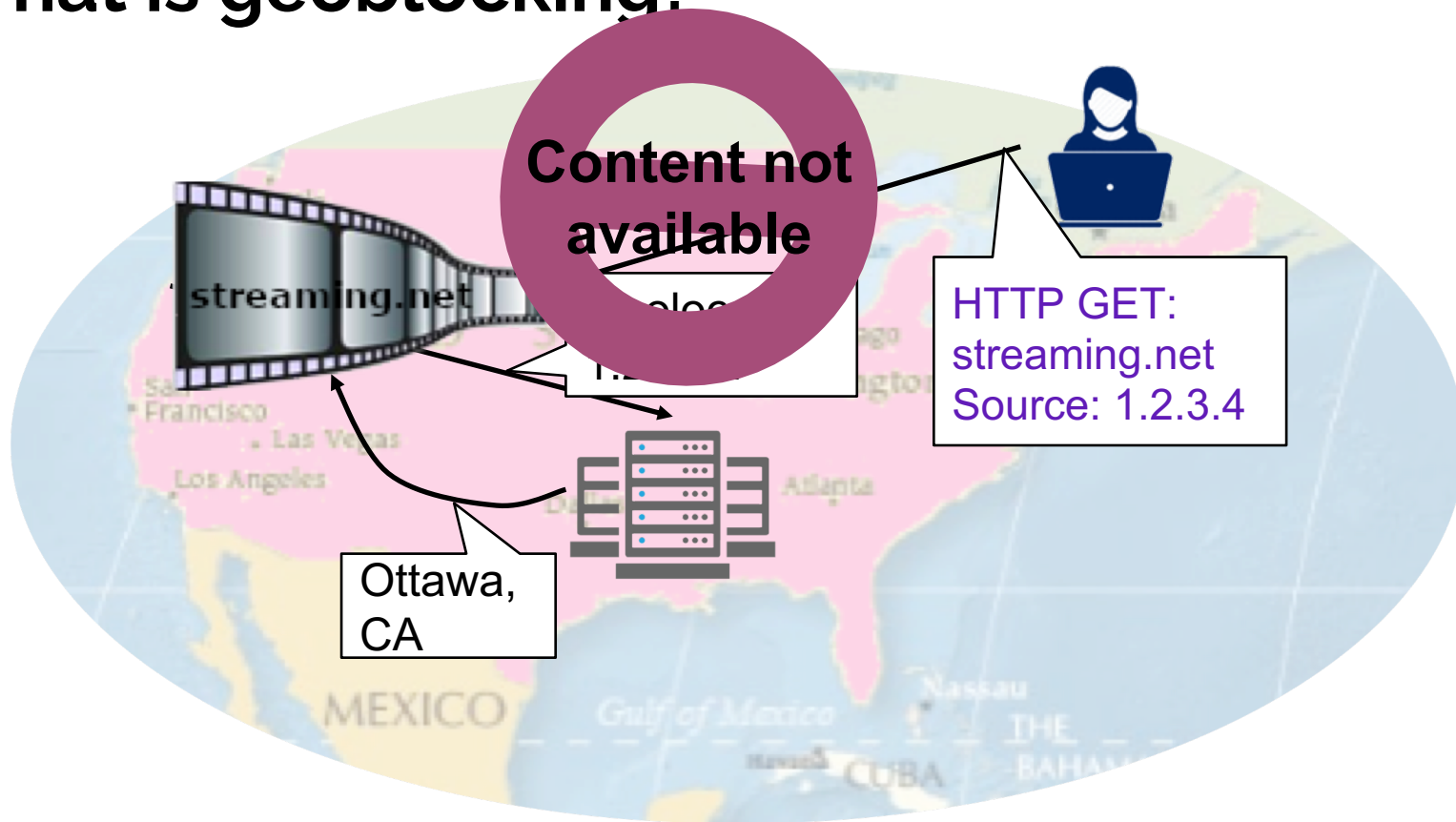
User Perceptions of the Privacy and Usability of Smart DNS

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What is geoblocking?



Smart DNS



Unblock your favourite websites, music and streaming services



[Home](#)

[Services](#)

[How to setup](#)

You can now visit any blocked website restricted in your place.

NETFLIX

hulu

iPlayer ^{BBC}

itv

ESPN



HBO

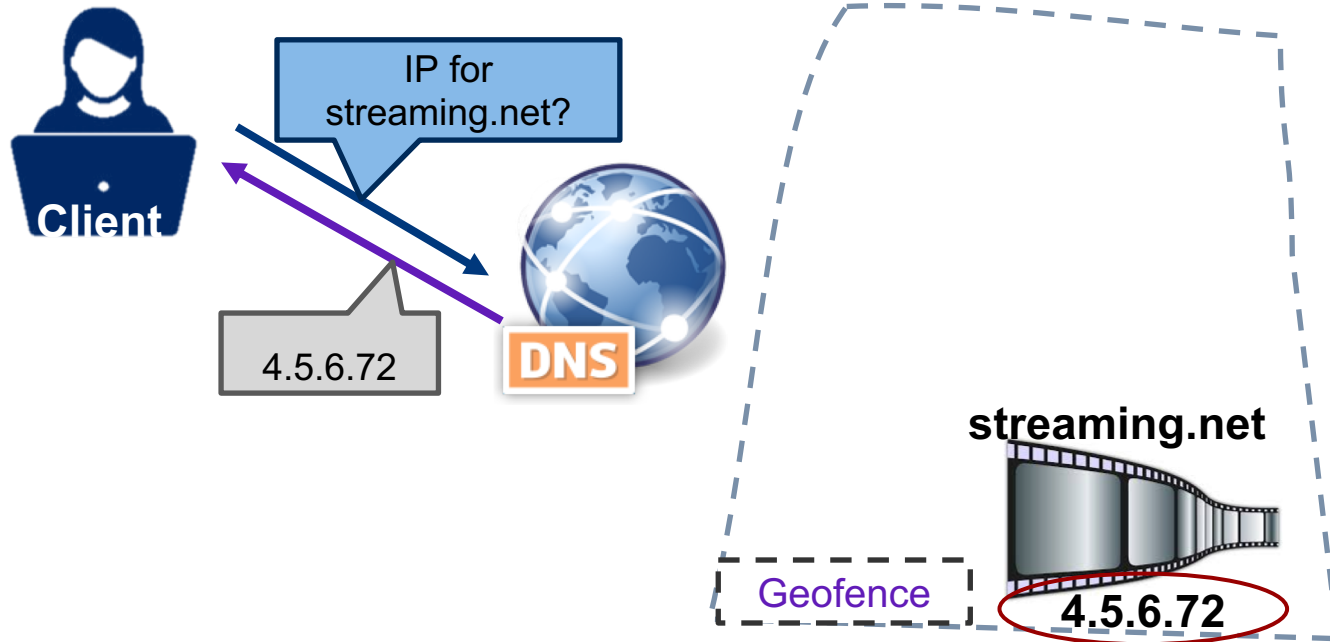


pandora

[More Supported Services](#)

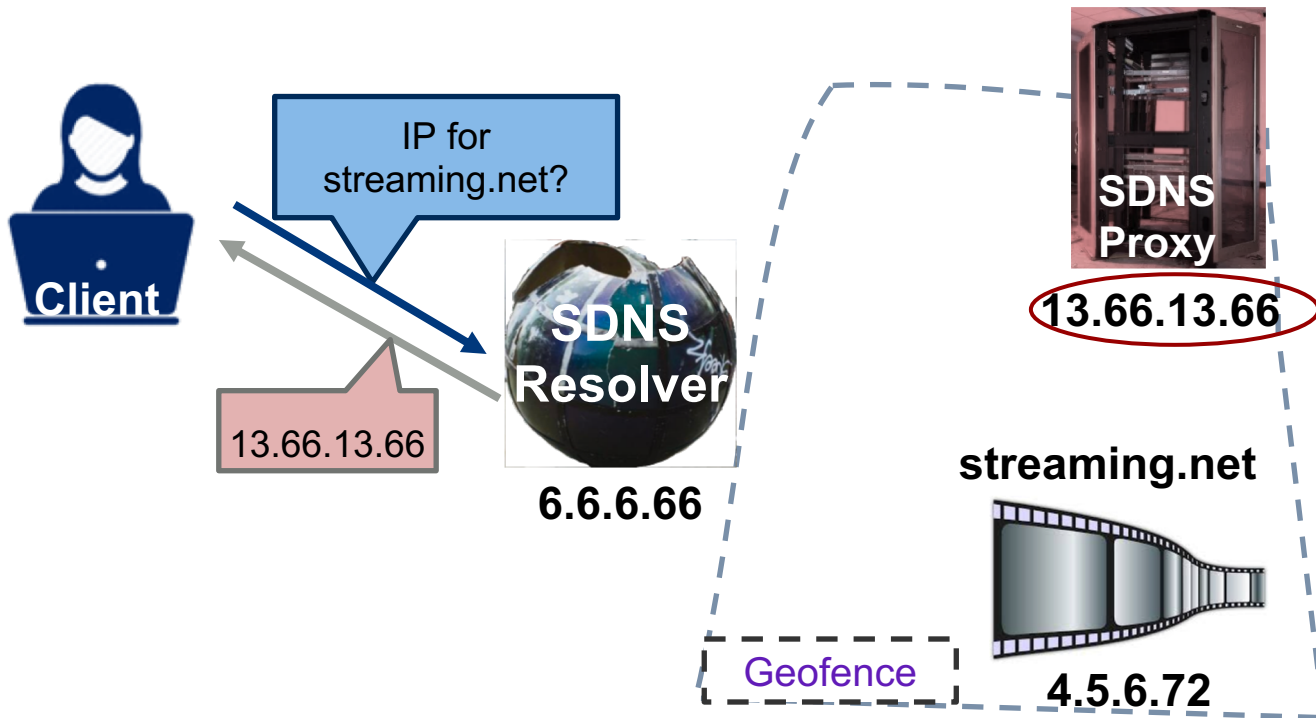
Smart DNS (SDNS) relies on SDNS resolvers

Using normal DNS:



Smart DNS (SDNS) relies on SDNS resolvers

Using SDNS:



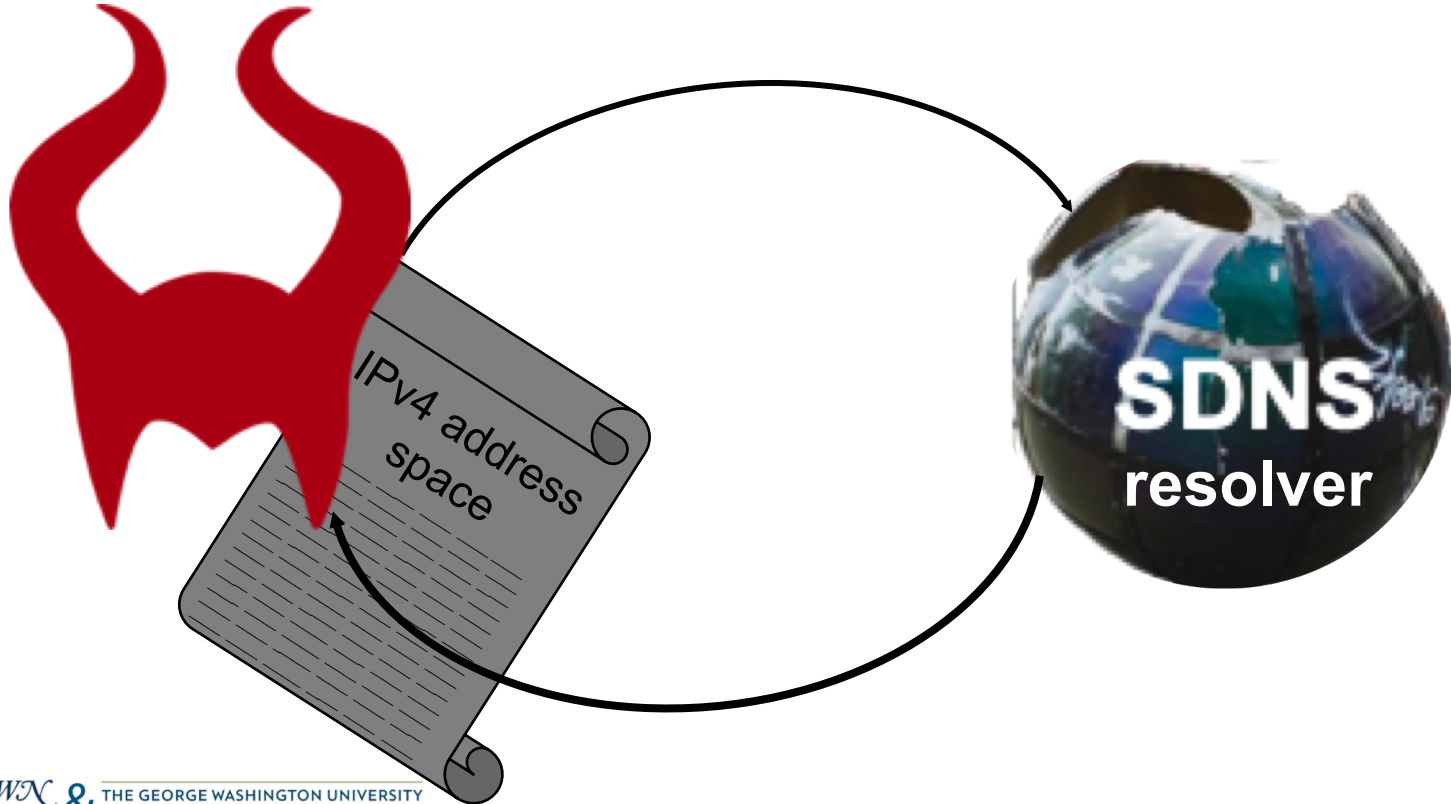
SDNS ≠ VPN

- Different stand-alone setups
- No added encryption
- No significant security/privacy benefits

SDNS ≠ VPN

- Fainchtein et al. [PETS 2021]
 - SDNS for geoblock evasion = threat to security & privacy
 - Attacks:
 - Content provider can trivially discover client's actual IP
 - For some SDNS services, any party can enumerate *all* clients' IPs

Threat: Customer IP enumeration attack



Our focus:

**How do users
perceive SDNS?**

Services could be confused

- SDNS often bundled into VPN subscriptions
- Ambiguous and possibly misleading advertisement

Services could be confused

★ Trustpilot - Rated **4.7/5**

Secure your It's w

Browse the internet with con

Get PureVPN

FAST, Reliable Browsing & Streaming with Smart DNS Proxy! 100% Anonymous.

Try It Now

No Credit Card Need
14 Days Free Trial. C

★ Trustpilot **★★★★**

**Enjoy Real Privacy
and Bypass Blocks!**

GET CACTUSVPN

Study Procedure

Study overview

$n = 63$ Participants (SDNS users) overall

$n = 58$ Participants included for likert (quantitative)
response analysis


- R = 10 Reddit
- P = 48 Prolific

Focused on participants'...

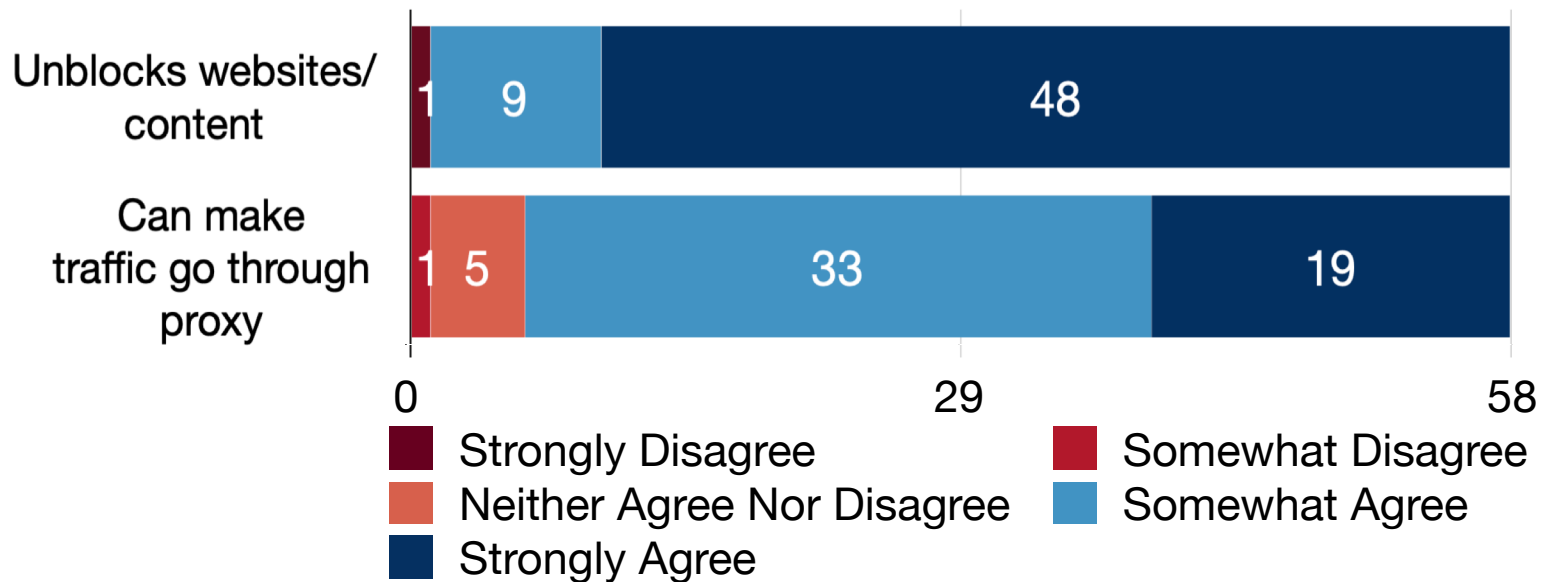
- Motivation to use SDNS
- Perceived impacts of SDNS usage
- Trust/distrust of SDNS services and their providers
- Perceived ethics and legality of using SDNS

Results

Motivation for using SDNS

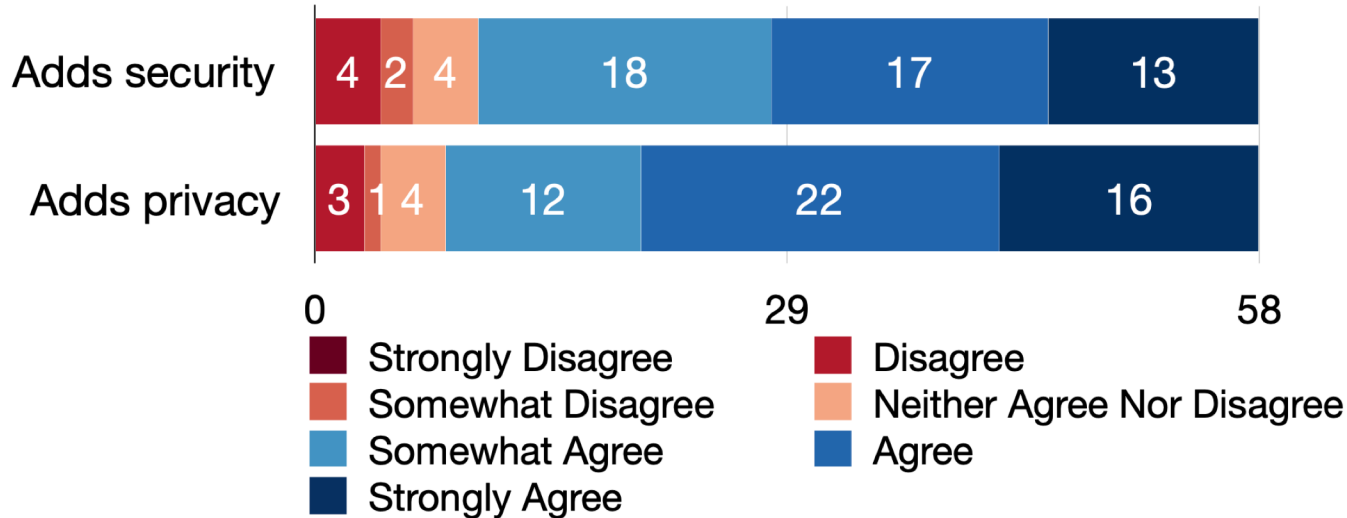
- Unblocking ($n = 52$)
 -  Geoblock evasion ($n = 38$)
- Online security/privacy protection ($n = 12$)

Participants were familiar with basic SDNS functionality



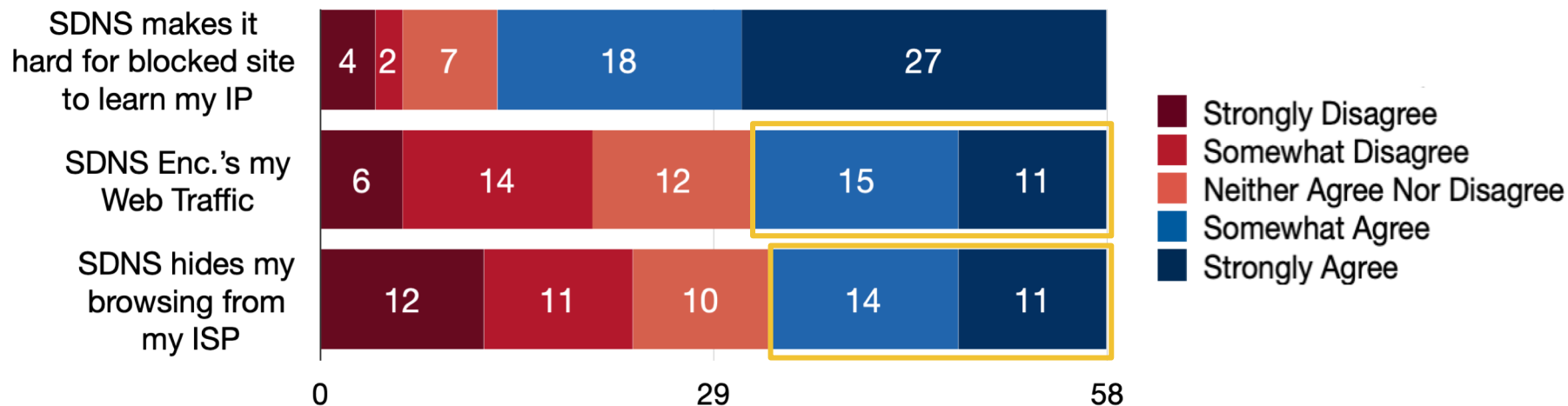
...but did not understand how it works and what that means

SDNS' Perceived Effect on Internet Browsing



Participants overestimated security properties

SDNS Security/Privacy Properties

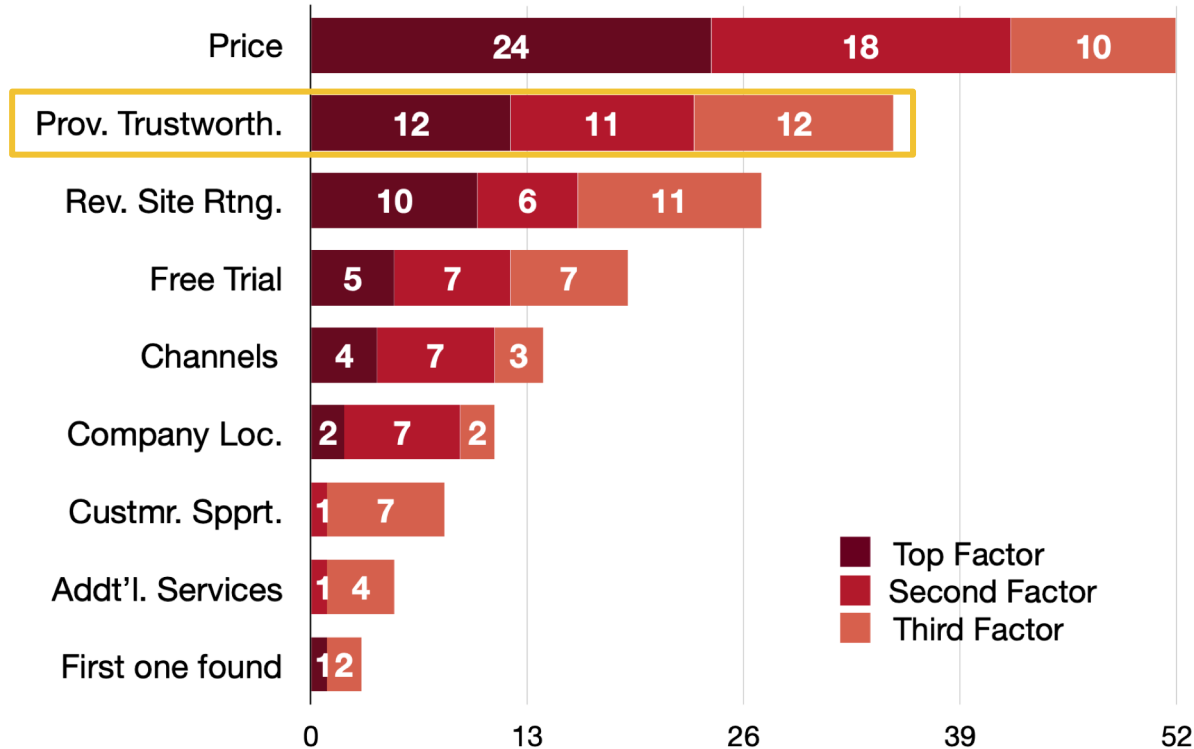


Participant choices, thoughts and decision processes

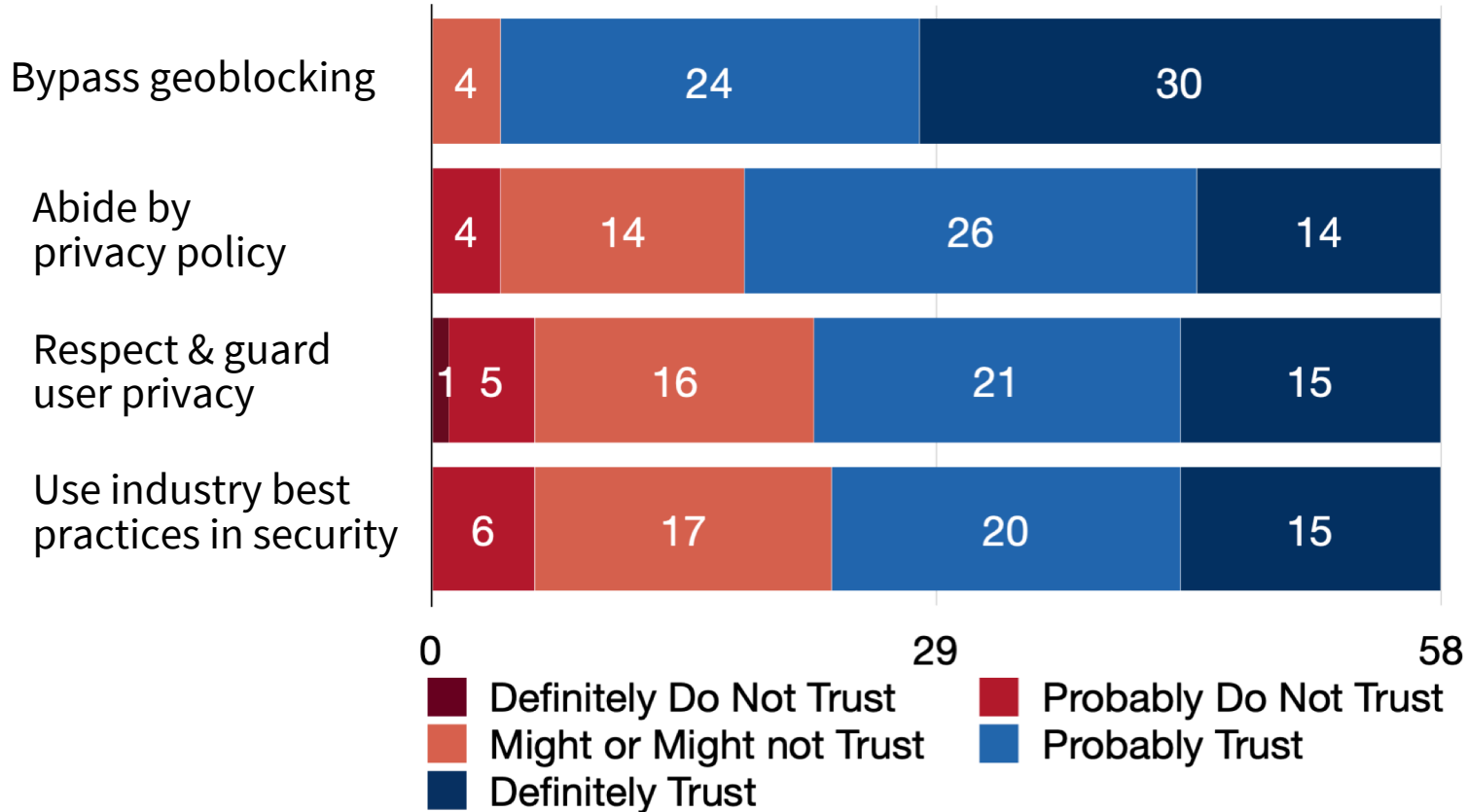
SDNS provider selection

Participants care about price, and trustworthiness

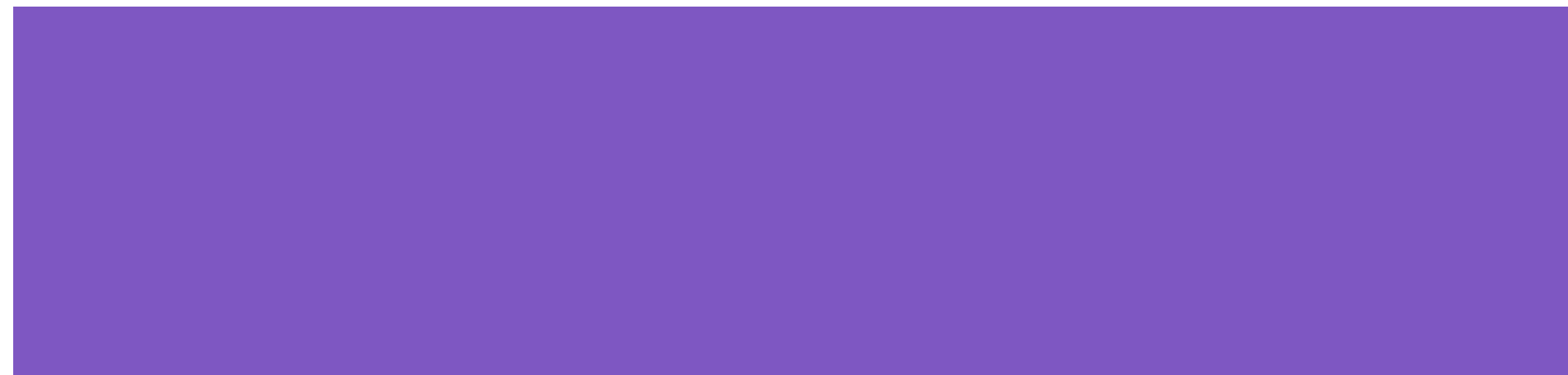
Key Factors in SDNS Provider Choice



Participant Trust of SDNS Provider to:



How did participants assess provider trustworthiness?



Positive factors

- Projected image of security ($n = 7$)
- Reviews ($n = 6$)
- Provider reputation ($n = 4$)

Positive factors

“The companies involved do seem to be **primarily based around online security, so being trustworthy is fundamental to their businesses.**

Many have been **around for a long time** now and **have excellent reviews/ratings,** so this gives me some reassurance.” (P51)

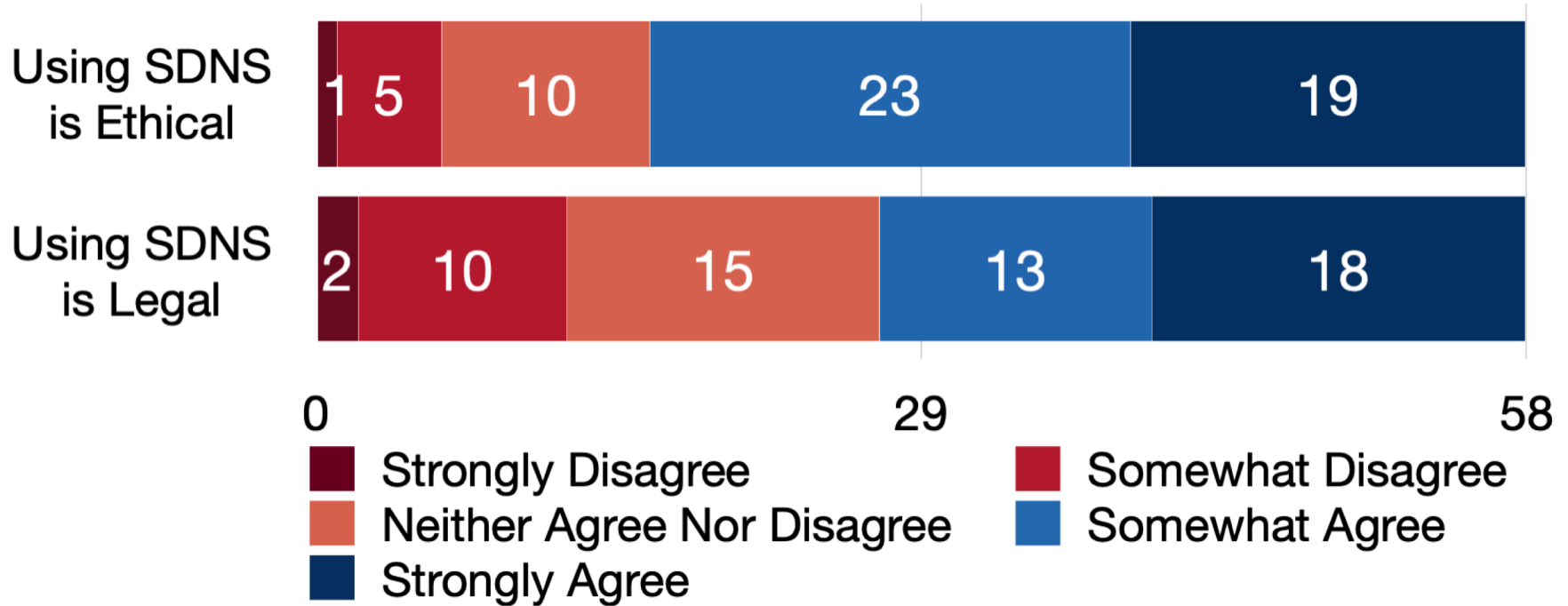
Lack of negative factors

- Service worked well ($n = 10$)
- Nothing noticeably bad ($n = 7$)

“... They must have the best kinds of security measures to protect their user's data, so that their **whole client base doesn't get backstabbed** by [the] **company [to whom] they are giving basically all their network traffic information.**” (P36)

Ethics and legality of using SDNS

Most participants found SDNS ethical and legal



Beliefs on ethics of unblocking with SDNS

- Geoblocking is unethical ($n = 27$)
 - Free and open Internet ($n = 8$)
 - Geoblocking = discrimination ($n = 3$)

“I believe in **free use and free access**

i [sic] believe it to be **unfair and bordering racism** if you don't provide [some] users with the same content that you would other [sic] if there is **no legitimate reason otherwise.**”(P11)

Beliefs on ethics of unblocking with SDNS

- Still paying to access content ($n = 5$)
- Not doing harm ($n = 4$)

“**I still paid for them** so I think it's a **better option than piracy** because the company got their money.” (P37)

“I'm not doing any harm to anyone. I'm just watching Netflix.” (P57)

General lack of clarity on legality of using SDNS

- Don't know ($n = 17$)

“I'm not aware if its completely legal in my country.

[I have] Never seen anything talking about this topic.”(P39)

General lack of clarity on legality of using SDNS

- Normalization/lack of enforcement ($n = 4$)
 - Widely used and publicly advertised ($n = 2$)

“...I would guess it **has to be legal for them to be so popular, and advertised on mainstream media (like YouTube).**” (P1)
 - Lack of enforcement:

“I think it is legal, **but if its [sic] not noone is going to come to your house** 'cause a lot of people do worst [sic] things in the internet...” (Q2)

Conclusion

- Gap between perception and reality of SDNS puts users at increased risk
- User education sorely needed
 - When geoblocking is/is not legal
 - When geoblock circumvention poses legal risk
 - Security and privacy risks of SDNS

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