

Bits Under the Mattress

Understanding Different Risk Perceptions and Security Behaviors of Crypto-Asset Users

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Motivation of the Research

~ 100 million unique crypto-asset users Wide choice of key storage options 4 million bitcoins are considered to be lost.

Who are the crypto-asset users? How do they handle keys?

Participant Recruitment

We surveyed **395 crypto-asset users** from Europe and North America in early 2020, in English and German. To improve coverage in a hard-to-reach population, we recruited participants by **a new combination of deep and broad sampling**:

195 participants recruited from crypto-communities;	3-4 years	USD 5k-10k
200 participants recruited through a commercial panel.	3-4 years	USD 10k-100k
	Median experience	Median investments

Survey Design

We surveyed participants on 5 psychometric constructs:

- Perceived vulnerability:** the perceived likelihood of private keys or accounts being compromised;
- Perceived severity:** the perceived impact of harm caused by the loss of crypto-assets;
- Perceived self-efficacy:** the perceived capability to secure keys and prevent the theft of crypto-assets, e. g.:
I am able to protect my private keys from being stolen.
Strongly disagree 1 2 3 4 5 Strongly agree
- Response cost:** the estimated cost or inconvenience associated with securing crypto-assets;
- Perceived concern:** the level of concern about broader security risks related to crypto-assets.

We then asked them about their **security behavior**, e. g.:

How often do you back up your crypto wallet?

Rarely Occasionally Regularly

A Robust Typology of Crypto-Asset Users

We identified a typology of **3 user personas**:

Cyberpunks

- Tech-savvy adopters and early enthusiasts
- Ideological and technological interest
- Mostly men (88%) around 25-44 years old

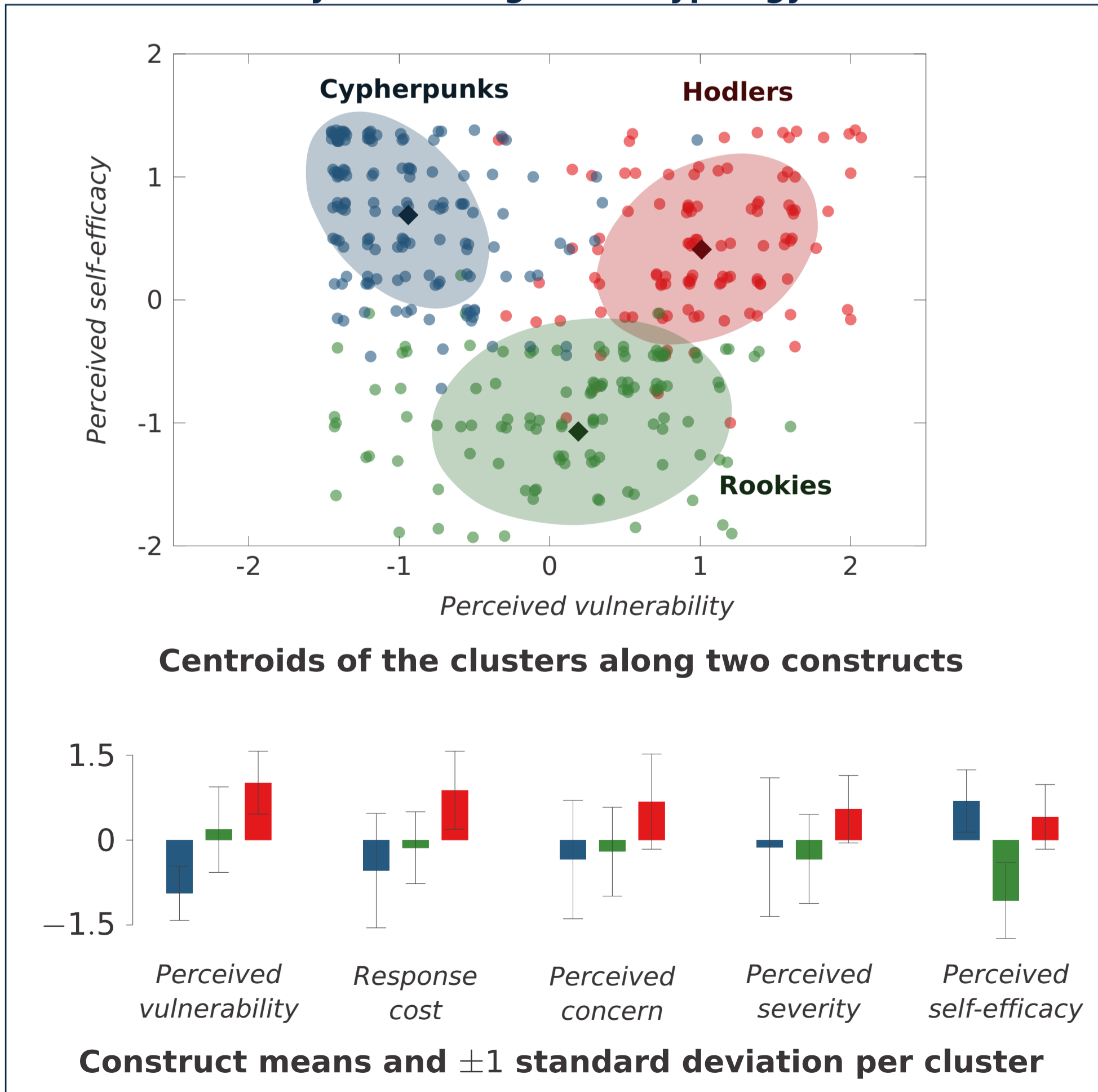
Rookies

- Casual users with fear of missing out
- Interest in long-term financial profits
- Higher prop. of women (33%) and seniors

Hodlers

- Traders (including on stock markets)
- Every fourth invests more than \$100k.
- Mostly men (80%) around 35-44 years old

The Cluster Analysis Leading to the Typology



Understanding Security Behavior

Almost 40% of the hodlers suffered substantial losses due to stolen keys. Rookies entrust their keys to third parties more than other user personas.

Have you ever lost a substantial amount of crypto-assets?

Who has control over private keys for most of your crypto-assets?

How often do you undertake the following security practices?

Scale: rarely, occasionally, regularly. % % %

Practice	Cyberpunks	Hodlers	Rookies
I back up my crypto wallet.	9 32 59	20 55 24	33 61
I encrypt backups for additional security.	23 29 48	23 52 25	42 49
I enable a MFA for my online accounts.	43 33 23	34 38 28	58 37

Design Implications

Crypto-asset users are not homogeneous.

Reference:
S. Abramova, A. Voskobojnikov, K. Beznosov, and R. Böhme. "Bits Under the Mattress: Understanding Different Risk Perceptions and Security Behaviors of Crypto-Asset Users." In *Conference on Human Factors in Computing Systems (ACM CHI)*. (virtual) Yokohama, Japan, 2021.

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