Voter, What Message Will Motivate You to Verify Your Vote?
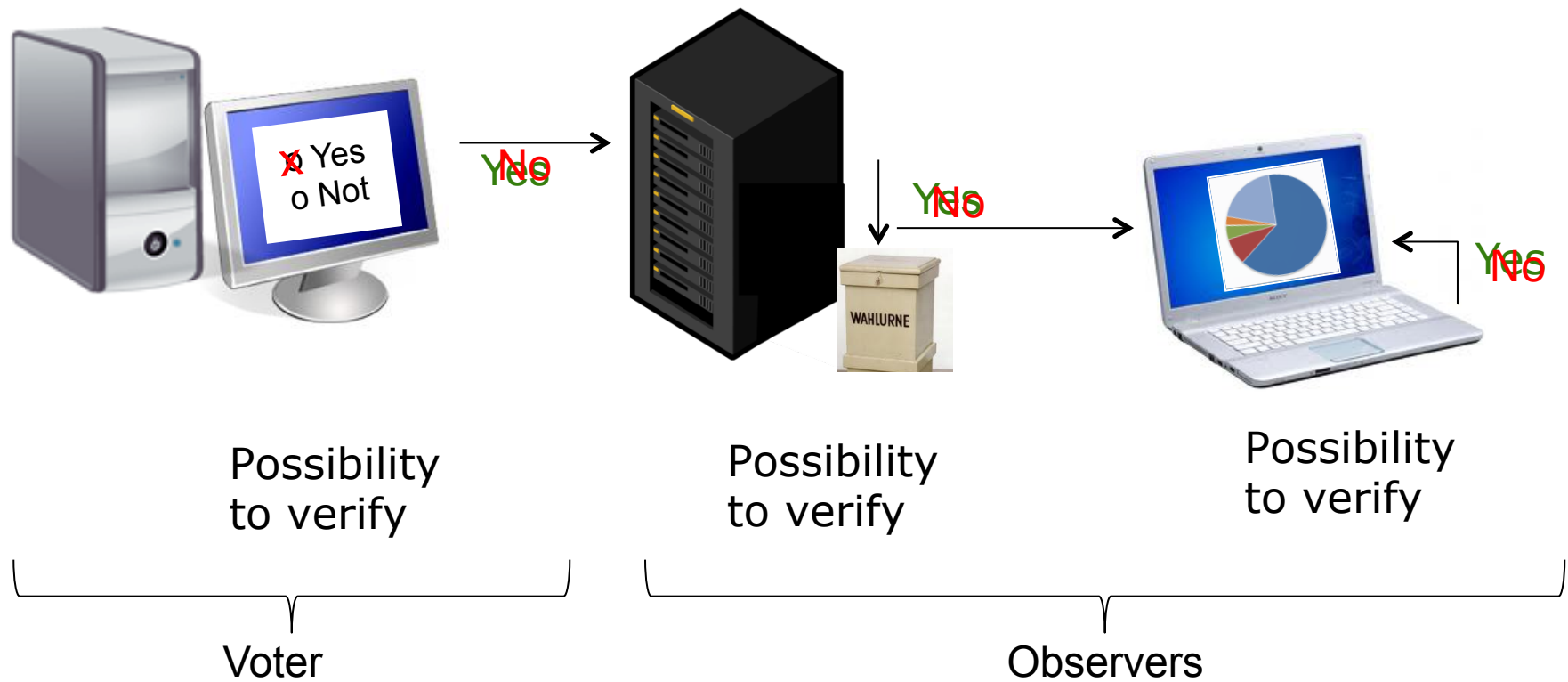
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CASED
Usable Security Lab
Crypto Lab

Background in electronic voting

Level of security

- Integrity violation can only be noticed if voter verifies

- But voters are not very likely to verify
  - As user studies have shown
  - Due to high trust in processes and people

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Goal

- Increase voter's general intention to verify

Research questions

- To what extent can a tailored message increase intention to verify?

- Will such a message have any effect on pre-existing intention to vote online?

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Developing the messages

- Reviewed literature on behaviour-change in information security
- Identified 28 theories and models
- Classified into 5 groups

Risk	Provide information about risks & how to cope
Norms	Inform people about the behaviours of others
Analogies	Personal experience is linked to new idea
Rewards/Penalties	Reward desired / penalize undesired behaviour
Training	Training programs/ security messages

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The individual messages

- **Risk**

Studies by the Federal Office for Information Security show that most PCs or laptops with Internet access are infected with malicious software, e.g. viruses. This malicious software could change your vote before encrypting and sending it to the election server, and you would not notice it. You can use the Election Verifying App to check if there is any malicious software on your PC or laptop that has changed your vote.

- **Norm**

Voters who want to protect democracy check if the voting system has correctly encrypted the selected candidates.
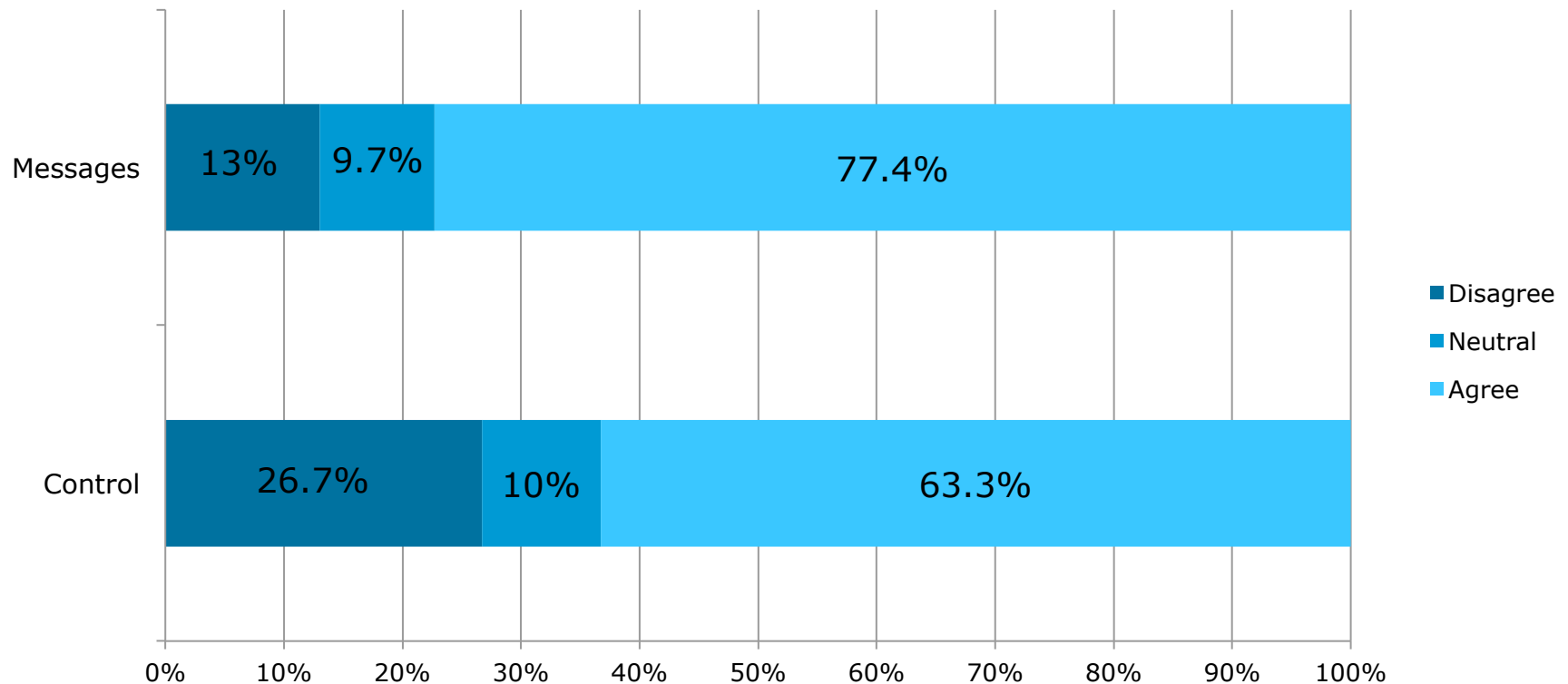
- **Analogy**

You have previously voted in several elections. Whenever you participated in an election, you voted on a ballot paper that was counted manually. You could be sure that your ballot paper was correct because you were the one who put a cross next to your candidate's name, folded the ballot paper and placed it in the ballot box. In Internet voting, you put a cross next to your candidate's name by clicking on the candidate. Your vote is then encrypted on your PC or laptop and is sent to the election server. The Election Verifying App enables you to ensure that your vote was not modified before encryption.

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Testing the messages

- Survey – focus on intention
  - Only potential Internet voters
  - Four groups
  - First one of the messages (or none – control)
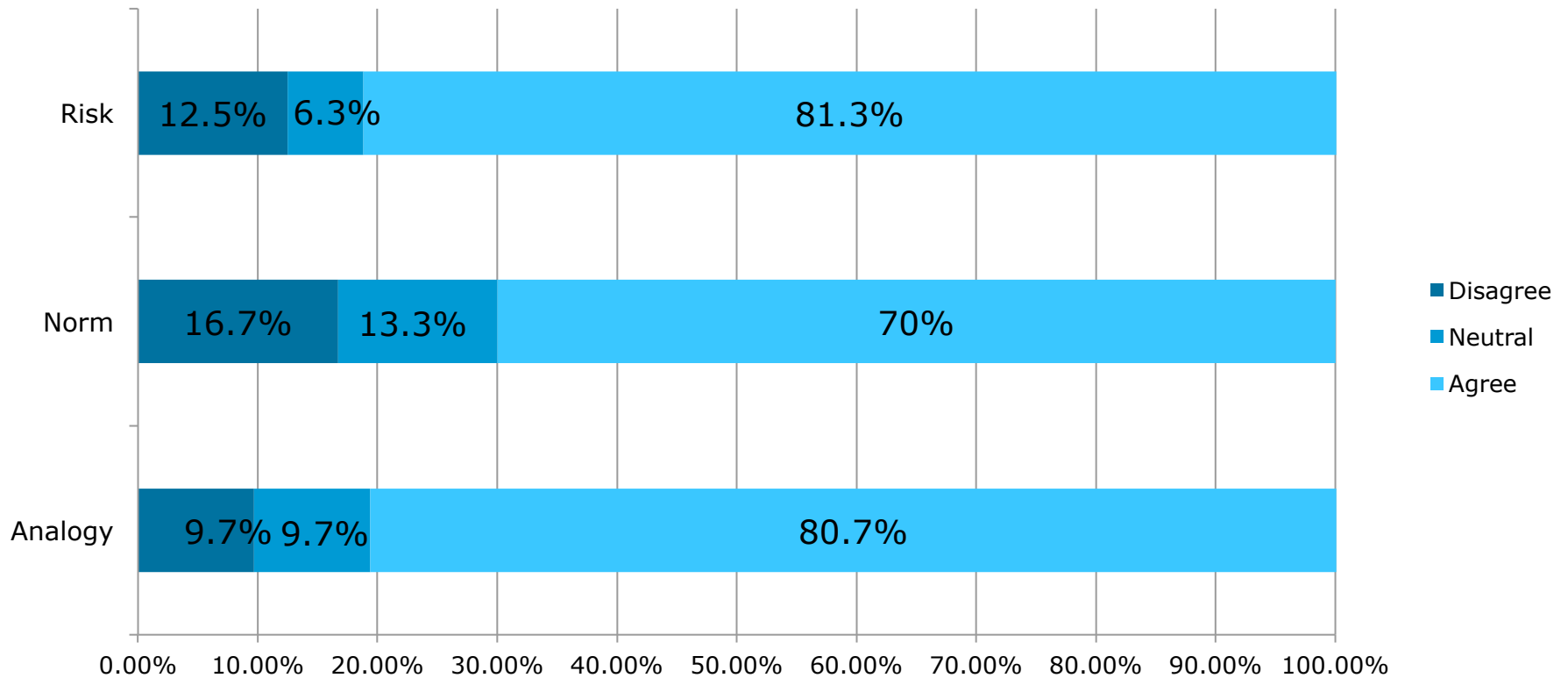 - Then instructions how to verify

- Data from 123 participants
  - 54 (43.9%) male; 69 (56.1%) female
  - Average age – 30
  - Most had university level education
  - Most had high computer proficiency

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Intention to verify (all messages)

Mann-Whitney U test (p<0.05; r = 0.45)

Intention to verify (ind. messages)

Kruskall-Wallis test (p>0.05)

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Intention to vote online (ind. messages)

	Risk (N = 32) %	Norm (N = 30) %	Analogy (N = 31) %	Control (N = 30) %
No	9.4	6.7	16.1	16.7
I don't know	6.3	26.7	3.23	16.7
Total	15.7%	33.4%	19.3%	33.4%

Chi square test (p>0.05)

Study limitations

- Sample not representative for population

- Only insight on intention not actual behavior

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Conclusion and future work

- Tested three messages (Risk, Norm, Analogy)
  - Messages in general increase intention to verify
  - No one message is more effective than the others
  - Some effect on intention to vote online

- Future
  - More insights from interviews
  - Test actual behaviour

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