Rethinking Voter Coercion: The Realities Imposed by Technology

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The Australian Ballot
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• Inception in 1850s

• Doesn’t just allow private voting ... privacy is enforced!
How Relevant is the Australian Ballot?

- Of course, many systems that offer inferior protections against coercion are in common use (e.g. Vote by Mail).
- There are scattered reports of employer coercion.
- Spousal coercion seems to be a real issue.
- Best election practices dictate publicly-monitored in-person voting as the only effective protection against coercion.
Camcorder Glasses
Camcorder Glasses
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• KJB Security DVR260 Camcorder Sunglasses
• 2GB Internal Memory allows 5 hours of Video Recording
• Available from Amazon.com for under $20
Camcorder Glasses
Camcorder Glasses

SPY NET
Stealth Recording Video Glasses

“Secretly Record
Up to 20 minutes Video”

Available for under $30.
Peaceful Co-existence?
if slide_number == 11
    then gratuitous_mention = “David Wagner”
Simple Coercion

• We go to poll together.
• I give you camcorder glasses.
• You sign in and vote.
• We exit poll together.
• You return glasses to me.
• I review your vote.
if slide_number == 13
  then gratuitous_mention = “Dan Wallach”
Varieties of Coercion

Perhaps a more careful analysis of different forms of coercion will give us some room to breathe.
Coercion versus Vote-Selling

• Is there a difference between *involuntary* coercion and *voluntary* vote-selling?

• Not really, a voter can voluntarily take the same actions.

• If a voter can be coerced, a voter can sell coercion rights.
Local versus Remote Coercion

• Can the same attack be performed remotely?
• Yes.
Remote Coercion

• Find a mirror near the polls.

• Get a good look at yourself.
Remote Coercion

• Sign in
Remote Coercion

- Vote
Remote Coercion

• Perhaps even behind a curtain
Remote Coercion

• Establish the date
Remote Coercion

• Send the recording
Retail versus Wholesale Coercion

• Are the attacks practical at a large scale?
• Yes.
Scalable Remote Coercion

A coercer ...

- need not spend $20 per voter per election
- can spot check videos of voting
- use high-speed playback
Time of Coercion

• Does time of coercion matter?

• Yes, coercion (vote-selling) must be premeditated.

• “Good” election protocols can prevent “after-the-fact” coercion.

• Some protocols can push the boundary time back so that coercion would have to be initiated prior to registration.
Juels, Catalano, & Jakobsson

Remote Voting Protocol

• Legitimate credentials are obtained during a confidential registration phase.

• Voters (optionally) engage in interactive proofs to ensure that the credentials they receive are valid.

• Voters can generate additional illegitimate credentials.

• Any credentials can be used to cast an encrypted vote.

• Verifiable process applied to set of all votes cast produces a tally of legitimate votes only.
Simplified (non-verifiable) JCJ

• A credential is just a \textit{random} ID number.
• Election officials maintain a (secret) list of validly-issued IDs.
• Each vote is submitted with an ID.
• Only votes with legitimate IDs are counted.
Voter Registration Scenarios

A high-tech tool

A basket of credentials
The Coerced Voter

• Register in person.
• Receive a legitimate credential.
• Upon leaving, pick up “some” additional credentials from a basket of illegitimate credentials.
• Voters may add any markings they desire.
The Skeptical Voter

• Register in person.

• Upon entering, pick up “some” credentials from a basket of legitimate credentials.

• Select one legitimate credential for permanent use and have the rest recorded by an official.

• All unselected credentials are proven to be legitimate by subsequent publication.
The Skeptical Coerced Voter

• Register in person.

• Upon entering, pick up “some” credentials from a basket of legitimate credentials.

• Select one legitimate credential for permanent use and have the rest recorded by an official.

• Upon leaving, pick up “some” credentials from a basket of illegitimate credentials.
The Typical Voter

• Register in person.
• Receive a legitimate credential.
• Leave.
Effective Mitigation of Early Coercion

• Election registrars can be trained to recognize cameras and enforce rules.
• Devices can be installed to detect unshielded circuits.
Paradigm Trade-Offs

**In-person voting**
- Coercion must precede voting
- Appear once per election
- Appear election days only
- Transient staffing
- Distributed

**In-person registration**
- Coercion must precede registration
- Appear once – ever
- Appear any time
- Permanent staffing
- Centralized
Why Vote Remotely?

• There’s little remaining benefit to voting in person.

• It’s easier for a coerced voter to “steal” 5 minutes of Internet access then to surreptitiously vote in person.

• Voter turnout could be enhanced.
Why Not Vote Remotely?

• Malware can compromise privacy and may be able to steal credentials – this is a benefit of smart card credentials over simple IDs.*

• Some voters have poor access to or are uncomfortable with technology.*

*Vote by Mail *may be possible here.
An Outrageous Claim

• Monitored in-person voting is no longer the most coercion-resistant voting method.

• Instead, remote voting with JCJ-style credentials offers greater resistance to coercion by time-shifting the period of vulnerability and centralizing the monitoring.
Consequences of Claim

• UOCAVA challenges may have feasible solutions.

• Election protocol design should be re-evaluated.
  • Extraordinary efforts that mitigate only some forms of coercion seem ill-advised.
  • Many protocols warrant re-design.
Issues and Opportunities

• Voters can *voluntarily* give their voting rights to proxies.
• Revocation of credentials
• Replacement of lost credentials
• Non-Internet-Based Voting (in person, VbM, etc.)
Questions