Perceptions of Coercion and Vote Buying in Remote Voting Across Four Countries

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Abstract: To address threats of coercion and vote buying, various voting schemes have been proposed. However, the extent to which these solutions address such threat scenarios that voters perceive as effective in influencing election outcomes has yet to be investigated. We conduct a study ($N = 178$) that evaluates how voters from four countries perceive these threats through different scenarios. We find that participants from Kenya and Mexico perceive the threat of vote buying as more effective in altering election outcomes than those from Finland and Sweden.

Keywords: Coercion, Perceptions, User study, Remote voting

1 Motivation

To mitigate threats of voter coercion and vote buying, various receipt-free and coercion-resistant solutions have been proposed. However, the socio-technical aspects of these solutions have been of limited consideration; while some works have investigated the usability of such systems [CLS24; Ju26; Me24; Ne18], other aspects, such as voters' awareness and concerns about threats these systems aim to prevent, have not gained much attention. Moreover, these aspects can be crucial in voters' acceptance of coercion-resistant systems. If voters believe that coercion and vote buying can change election results, this might raise their concerns about election integrity and decrease their trust in remote voting, unless these threats are addressed. On the other hand, if voters are not concerned about these threats, the additional complexities introduced by such systems (such as requiring them to remember secrets) might deter them from using the system. Furthermore, the effectiveness of proposed solutions depends on context-specific security assumptions (e.g., that the voter is alone at a given time or that an adversary is absent during certain steps). It is therefore critical to analyse concrete coercion scenarios to assess whether these assumptions align with the situations in which voters actually perceive such threats, as any misalignment may limit both the voters' acceptance of these solutions and the effectiveness of these solutions to protect against coercion. To our knowledge, only a quantitative study has investigated voters' perceptions of coercion and vote-buying in remote voting [Me24]. The study was conducted in the USA, leaving open the question of the generalisability of its findings to other contexts.

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In this study, we address this research gap by answering the research question: *How do voters from four different countries perceive the threat of coercion and vote buying in remote voting, and to what extent do they believe these threats can influence election outcomes?*

2 Methodology

Study Design We conducted an online survey. We identified four countries without remote voting using the Corruption Perceptions Index. We selected the two countries with the highest and lowest rank that had at least 100 participants available on Prolific. This process led us to identify *Finland, Kenya, Mexico, and Sweden*. To investigate perceptions of coercion and vote buying, we derived eight scenarios based on previous studies [Me24; Ni25] and a qualitative pre-study consisting of semi-structured interviews from 16 participants from North Macedonia.

Study Procedure Our study consisted of an online survey. In the survey, we presented the participants with the eight scenarios of coercion and vote-buying, which were randomised to reduce order effects [4]. For each scenario, participants answered the question: *How effective do you think this scenario would be at changing the outcome of an election in your country?* on a 5-point Likert scale. The participants were also asked the following open-ended question: *Please use the space below to explain your reasoning for the answers you gave above*. We included an attention check for quality control. Before finishing, the participants completed demographic questions.

Recruitment and Ethics We recruited 197 participants through Prolific. All participants were residents of, born in, and citizens of Finland, Kenya, Mexico, or Sweden and were fluent in English. We paid the participants £3.17 for their participation. We received approval from the ethical committee of our institution. In addition, we provided participants with a consent form, which included the purpose of the study, withdrawal options, and data handling procedures. Participants had the option to leave the study without consequences if they felt any discomfort.

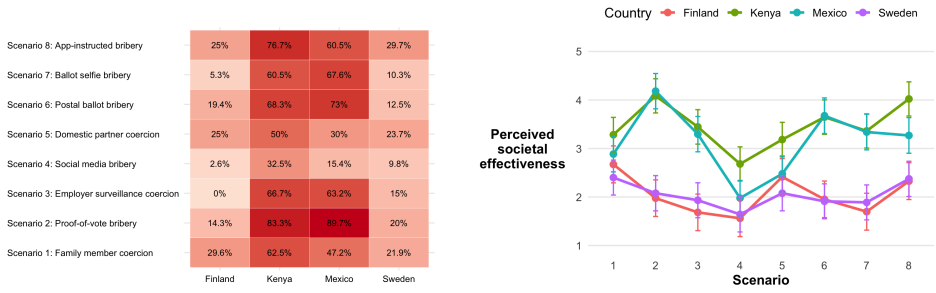
Data Analysis We coded our Likert-scale responses as numerical values (1 = not effective at all, 5 = very effective). We conducted a linear mixed-effects model (LMM) using the lme4 package, with the country, the scenario, and their interaction as predictors of *perceived societal effectiveness*. The model included a random intercept for the participant to account for repeated measures across the eight scenarios. For the open-ended responses, we used an inductive approach. Each researcher developed initial codes from a random sample of 50 responses and then discussed them together to create the codebook. Using the codebook, two researchers then coded another sample of 25 responses, resulting in a Cohen's Kappa of 66%, indicating a sustainable agreement. Lastly, one researcher coded 75% of all responses, while the other researcher coded 25%.

[4] All supplementary materials are available in the online repository [An26].

3 Results

A total of 178 participants completed the study, 41 from Finland, 47 from Kenya, 44 from Mexico, and 46 from Sweden.

Quantitative Results Across all scenarios, participants from Kenya and Mexico generally perceived the scenarios as more effective in changing the election outcome than participants from Finland and Sweden (see Fig. 1a). In particular, vote-buying scenarios are perceived as effective, with scenario 2 receiving the highest ratings, at 83.3% in Kenya and 89.7% in Mexico. The linear mixed-effects model reveals significant main effects of the country and the scenario, as well as their interaction (all $p < 0.001$). The post-hoc comparisons using estimated marginal means (Holm-adjustment) reveal that effect of country varies substantially across scenarios. In scenarios 2, 3, 6, and 7, perceived societal effectiveness is rated significantly higher for Kenya and Mexico than Finland and Sweden (all $p < 0.001$). In contrast, scenario 1 shows a limited difference between the countries on perceived societal effectiveness, with all comparisons non-significant except for Kenya versus Sweden ($p < 0.01$). In scenarios 4 and 5, perceived societal effectiveness is rated significantly higher for Kenya than for Finland, Mexico, and Sweden ($p < 0.05$). In scenario 8, perceived societal effectiveness is rated significantly higher for Kenya and Mexico than for Finland and Sweden (all $p < 0.01$). However, perceived societal effectiveness is also rated significantly higher for Kenya than for Mexico ($p < 0.01$). Fig. 1b illustrates how the effect of country on perceived societal effectiveness varies across scenarios.



(a) Perceived societal effectiveness of scenarios in changing election outcomes, showing the percentage of participants who rated each scenario as "effective" or "very effective".

(b) Interaction between country and scenario on perceived societal effectiveness, model-predicted marginal means with 95% confidence intervals.

Fig. 1: Heatmap (a) and interaction plot (b) of perceived societal effectiveness across countries and scenarios.

Qualitative Results For scenarios, which involve a personal relationship with the adversary, the majority of the participants perceive these as effective due to loyalty to the family, a wish to avoid harm, or because these scenarios already happen: *"It is effective since we care more about what our family says."* However, another group of participants also consider the incentive too weak for voters to comply either because family and partners' opinions

are irrelevant, because money is a stronger incentive, or because they believe the scenario will not happen on a large scale: *"It is unlikely to work since you do not usually listen to what a family member wants you to do."* For a scenario, which involves a professional relationship with the adversary, most participants from Finland and Sweden believe that such a scenario would be reported and exposed to the public. In contrast, the largest group of participants from both Kenya and Mexico considers it effective because the voter wants to avoid losing their job. For scenarios, which involve offering money, the participants from Kenya and Mexico generally perceive them as effective either due to the financial incentive or to these scenarios being already known issues in the elections, with concrete examples. One participant says: *"This is actually happening in my country, a lot of candidates coming to houses offering money for a vote."* In contrast, participants from Finland and Sweden mainly believe that such scenarios will be reported and exposed to the public: *"If a party operative in my country were to offer money to voters, it would be on the front pages of the newspapers almost immediately."* In the case of a scenario, which involves offering a social media account, the participants perceive the incentive too weak for voters to comply. Furthermore, a smaller group believes that voters would consider it a scam.

Conclusion We conclude that voters' context shapes their perceptions of the threats of coercion and vote-buying. We therefore recommend that solutions against such threats in remote voting should be designed and evaluated based on context-specific perceptions, ensuring that the implemented solutions align with voters' concerns and expectations in the given context.

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