# Benefits of Diverse News Recommendations for Democracy

Juliane A. Lischka[1], Lucien Heitz[2,3], Alena Birrer[4], Bibek Paudel[5], Suzanne Tolmeijer[2], Laura Laugwitz[1], Abraham Bernstein[2,3]

[1] Department of Journalism and Communication, University of Hamburg, Germany
[2] Department of Informatics, University of Zurich, Switzerland
[3] Digital Society Initiative, University of Zurich, Switzerland
[4] Department of Communication and Media Research, University of Zurich, Switzerland
[5] Stanford University, USA

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News recommenders could
a) create self-reinforcing biases that damage public debates (Milano et al., 2020)
b) powerful tools to shape public opinion and serve as a foundation for public cohesion (Bernstein et al., 2021)

# Background

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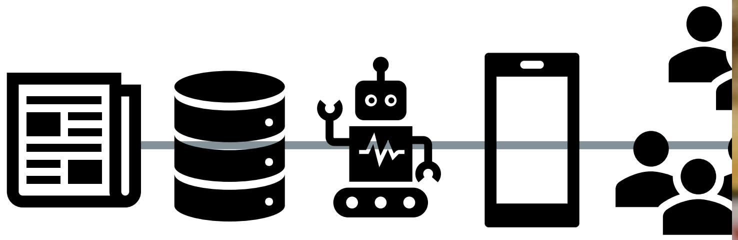
# Experimental design

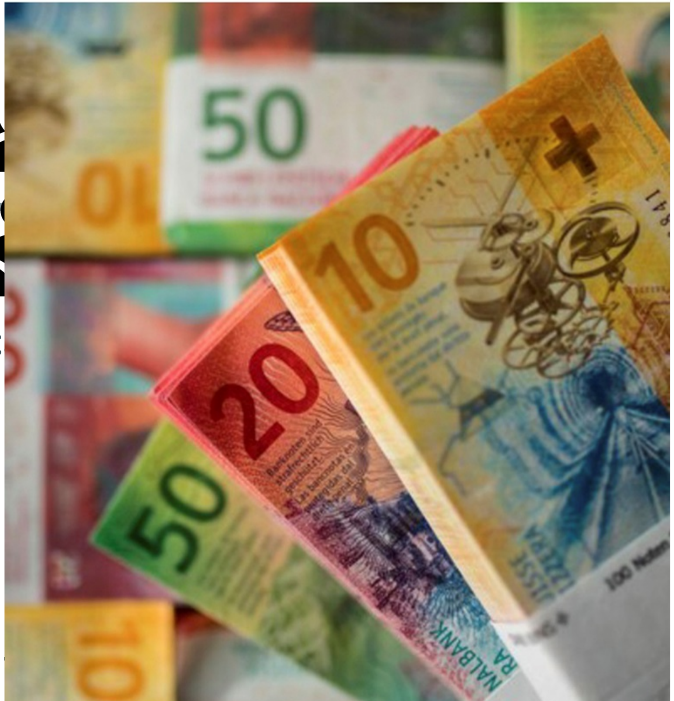


Politic

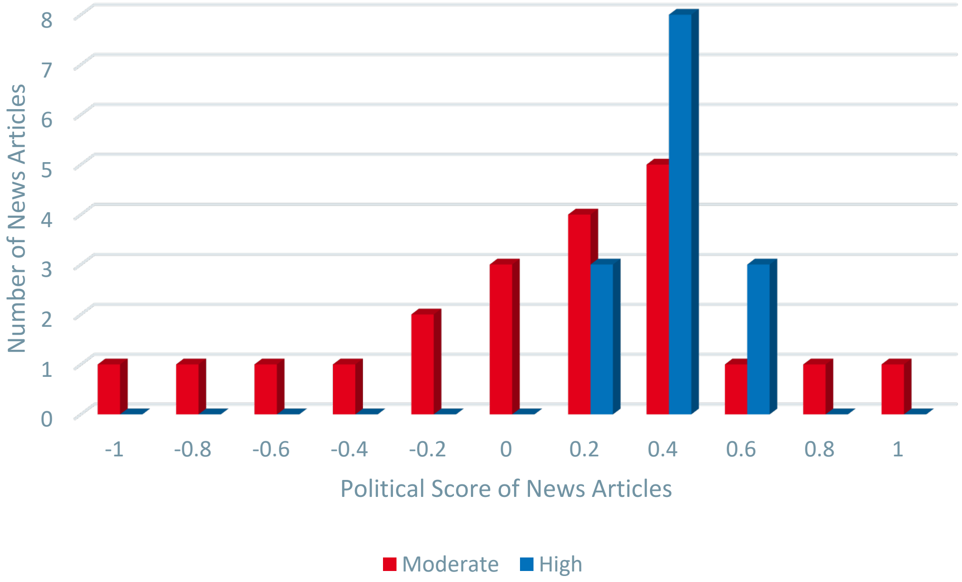
## Kanadier haben die Schönste: Neues 200er-Nötli war chancenlos

Jahr für Jahr werden die schönsten Banknoten der Welt prämiert. Für einmal musste sich die Schweiz geschlagen geben.

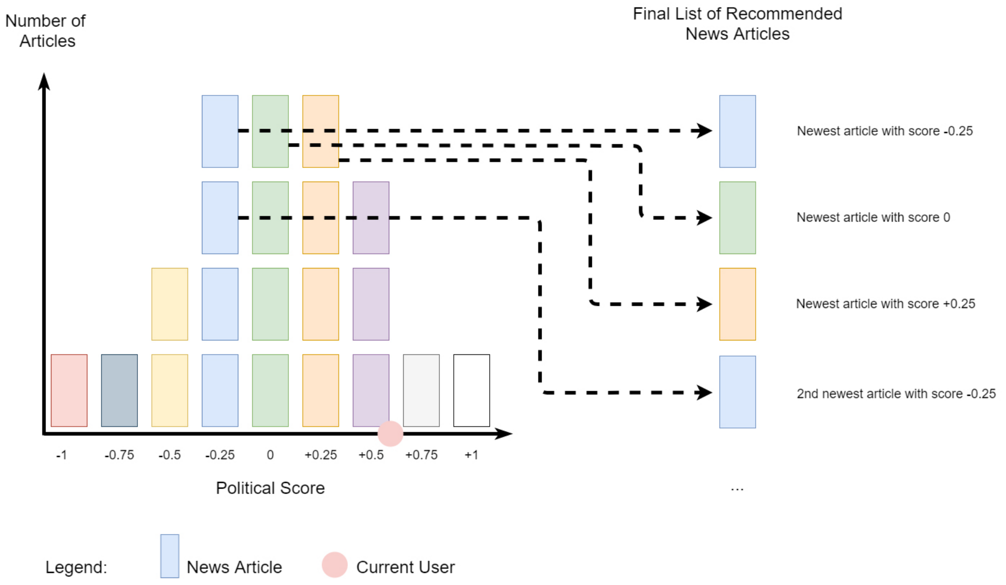
Heute, 18:30 Uhr



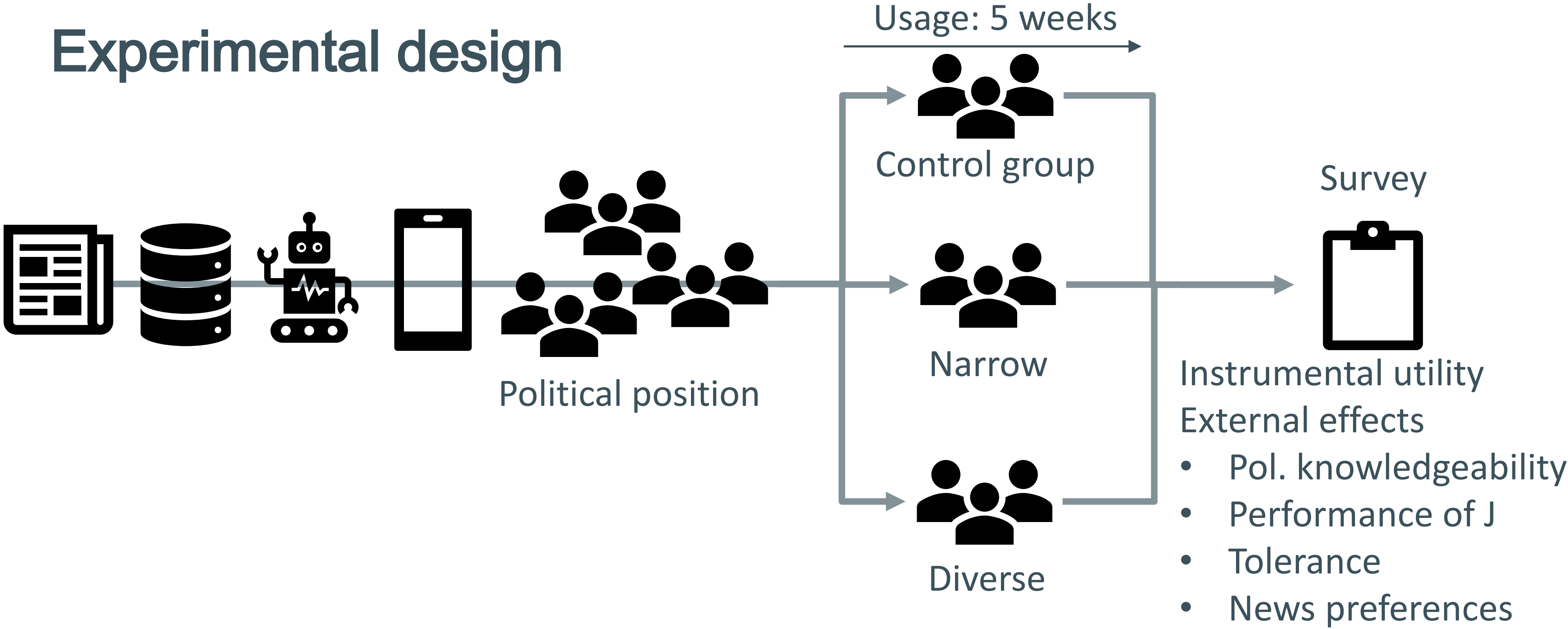
# Narrow vs. diverserecommendations for a 0.4 user



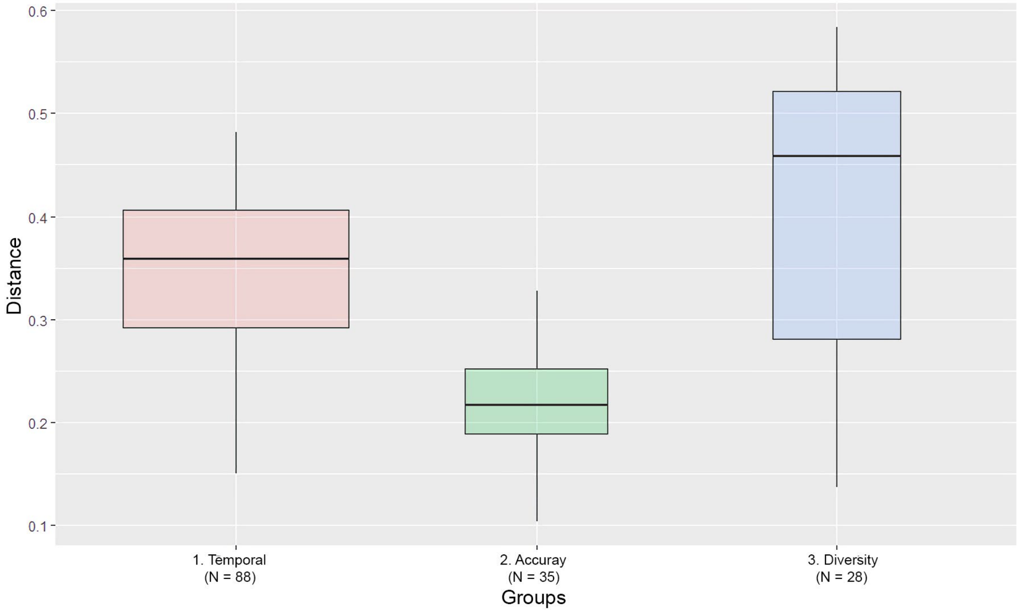
# From article distribution to recommendation list



# Experimental design



# Article use and article distances



# Surveyresults (1/2)

| | Instrumental utility | | | Political interest | | | Political participation | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | $p$ | $\eta_p^2$ | $\beta$ | $p$ | $\eta_p^2$ | $\beta$ | $p$ | $\eta_p^2$ |
| Constant | 3.668 | 0.000 | 0.468 | 1.227 | 0.004 | 0.057 | 2.242 | 0.000 | 0.233 |
| Diversity Group | 0.284 | 0.495 | 0.003 | 0.573 | 0.279 | 0.008 | -0.136 | 0.754 | 0.001 |
| Narrow Group | 0.391 | 0.254 | 0.009 | 0.662 | 0.128 | 0.017 | -0.144 | 0.686 | 0.001 |
| Political position | 0.037 | 0.900 | 0.000 | 0.270 | 0.476 | 0.004 | -0.034 | 0.912 | 0.000 |
| App usage (hrs) | 0.020 | 0.009 | 0.048 | -0.004 | 0.670 | 0.001 | 0.013 | 0.113 | 0.018 |
| Ext. news usage | 0.014 | 0.047 | 0.028 | 0.020 | 0.024 | 0.036 | 0.023 | 0.002 | 0.069 |
| Gender (f = 1; m = 2) | -0.035 | 0.783 | 0.001 | 0.702 | 0.000 | 0.123 | 0.370 | 0.005 | 0.055 |
| Age (y) | -0.005 | 0.241 | 0.010 | -0.001 | 0.898 | 0.000 | 0.000 | 0.976 | 0.000 |
| Education | -0.047 | 0.068 | 0.024 | 0.020 | 0.530 | 0.003 | 0.077 | 0.005 | 0.057 |
| Diversity x Pol. pos. | -0.424 | 0.537 | 0.003 | -0.855 | 0.329 | 0.007 | -0.016 | 0.982 | 0.000 |
| Narrow x Pol. pos. | -0.845 | 0.123 | 0.017 | -0.558 | 0.421 | 0.005 | 0.185 | 0.745 | 0.001 |
| $F$ ($p$) | 1.862 (.055) | | | 4.467 (.000) | | | 5.483 (.000) | | |
| Adj. $R^2$ | .055 | | | .189 | | | .231 | | |
| df | 139, 10 | | | 139, 10 | | | 139, 10 | | |

# Surveyresults (2/2)

| | Social performance of journalism | | | Tolerance for opposing views | | | News preferences for opposing views | | | News preferences for majority views | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $\beta$ | $p$ | $\eta_p^2$ | $\beta$ | $p$ | $\eta_p^2$ | $\beta$ | $p$ | $\eta_p^2$ | $\beta$ | $p$ | $\eta_p^2$ |
| Cons. | 1.465 | 0.000 | 0.087 | 2.869 | 0.000 | 0.401 | 2.937 | 0.002 | 0.068 | 3.770 | 0.000 | 0.090 |
| Div. | 1.098 | 0.032 | 0.033 | 1.443 | 0.000 | 0.097 | 0.903 | 0.054 | 0.026 | 0.748 | 0.159 | 0.014 |
| Nar. | 0.883 | 0.035 | 0.032 | 0.577 | 0.061 | 0.025 | 0.487 | 0.204 | 0.012 | 0.955 | 0.025 | 0.036 |
| Pol. pos. | 0.731 | 0.046 | 0.029 | 0.850 | 0.002 | 0.068 | 0.373 | 0.265 | 0.009 | 0.554 | 0.134 | 0.016 |
| App use | 0.012 | 0.195 | 0.012 | 0.013 | 0.062 | 0.025 | 0.022 | 0.009 | 0.049 | 0.017 | 0.060 | 0.025 |
| Ext. news | 0.009 | 0.263 | 0.009 | 0.018 | 0.005 | 0.055 | 0.026 | 0.000 | 0.088 | 0.013 | 0.095 | 0.020 |
| Gender | 0.140 | 0.361 | 0.006 | -0.059 | 0.603 | 0.002 | -0.065 | 0.647 | 0.002 | -0.144 | 0.359 | 0.006 |
| Age (y) | -0.003 | 0.574 | 0.002 | -0.011 | 0.005 | 0.056 | -0.553 | 0.506 | 0.003 | -0.708 | 0.441 | 0.004 |
| Edu. | 0.100 | 0.002 | 0.070 | 0.068 | 0.004 | 0.059 | 0.008 | 0.768 | 0.001 | -0.043 | 0.173 | 0.013 |
| Div.xPos. | -1.628 | 0.053 | 0.027 | -2.567 | 0.000 | 0.111 | -1.200 | 0.122 | 0.017 | -0.598 | 0.492 | 0.003 |
| Nar.xPos. | -1.052 | 0.115 | 0.018 | -0.813 | 0.098 | 0.020 | -0.687 | 0.263 | 0.009 | -1.289 | 0.058 | 0.026 |
| $F$ ($p$) | 2.978 (.002) | | | 4.971 (.000) | | | 2.755 (.004) | | | 1.635 (.103) | | |
| Adj. $R^2$ | .119 | | | .210 | | | .105 | | | .041 | | |
| df | 137, 10 | | | 139, 10 | | | 139, 10 | | | 139, 10 | | |

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# Conclusion

1. Audiences find diverse news just as useful
2. Diverse news may induce tolerance, especially for conservative users
3. Diverse news can nudge users to prefer diverse news diet

→ Diverse recommendations may have a de-polarizing capacity

# From article distribution to recommendation list

**Algorithm 1:** Translation Algorithm

**Input** : $score_u, art\_distribution$ `//` $art\_distribution$ `defined as list of tuples` $score_a, n_a$

**Output** : $desired\_distribution$

$max = maxScore(art\_distribution)$ `// find largest value of` $n_a$ `among all tuples`

$desired\_distribution = []$ `// initialize recommendation list`

**while** $maxScore(art\_distribution) > 1$ **do**

  $tuples_{filter} = filterTuples(art\_distribution, max)$ `// get tuples of` $art\_distribution$ `where` $n_a = max$

  $tuple_{max} = maxDistance(tuples_{filter}, score_u)$ `// get tuple where` $|score_a - userScore|$ `is maximal`

  $appendScore(tuple_{max}, desired\_distribution)$ `// add` $score_a$ `of` $tuple_{max}$ `to` $desired\_distribution$

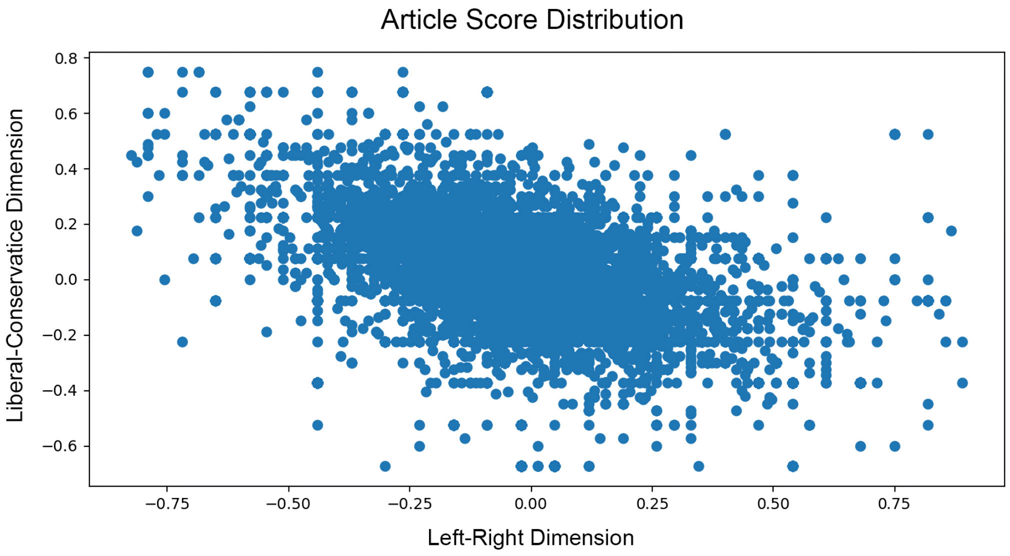
  $reduceCount(tupel_{max})$ `// decrement` $n_a$ `of` $tuple_{max}$ `by 1`

  **if** $maxScore(art\_distribution) \neq max$ **then**

    $max = max - 1$

**return** $desired\_distribution$

# Article scoredistribution



1.
2.
3.

# Outlook

# Thank you!