# Different Ways to Deceive

## Uncovering the Psychological Effects of the Three Dark Patterns Preselection, Confirmshaming, and Disguised Ads

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## BACKGROUND

**Dark Pattern** as deceptive design structure in the internet to influence user behavior in the interest of website providers – often contradictory to users intention (Gray et al., 2019; Narayanan et al., 2020)
→ impact on decision making process: disrupting process from action planning or intention building to actual behavior performance on multiple levels (Mathur et al., 2021)

| | PERCEPTION | EMOTION | MOTIVATION | COGNITIVE LOAD |
|---|---|---|---|---|
| **point of attack** | point of attack: visual design of web content (Hogan et al., 2022) | inducing guilt, shame, fear of missing out, need to belong (Leiser & Yang, 2022) | reduced ability to actively and attentively engage with content – use of heuristics and biases (Mathur et al., 2019) | multiple decision processes at the sime time foster automated processing (Baroni et al., 2021) |
| **dark pattern** | **Preselection**<br>*of choice options*<br>I want to register. | **Confirmshaming**<br>*emotionally coloured language to promote a choice option*<br>Yes, I cannot do without this offer.<br>No thanks, I hate saving money. | **Disguised Ad**<br>*advertisements embedded in website environment – advertising content may be processed as a news article* | **Combination of Dark Patterns**<br>*to increase deception* |

**Dark Patterns with varying mechanisms and effects on decision behavior and transaction costs (i.e., time to take a decision, negative emotions, …)**

## RESEARCH QUESTIONS

How do dark patterns influence the **decision making behavior** and **transaction costs** of users?

Are there **differences** in dark patterns deceiving mainly on a **perceptual**, **emotional** or **motivational,** or **cognitive** level?

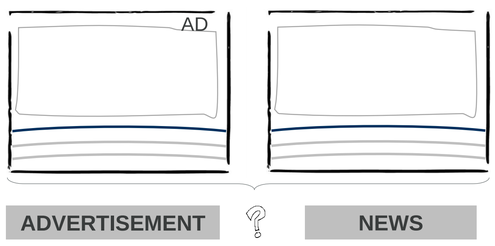
## MATERIALS AND METHOD

online experiment as 5-factor within-person design | two experimental tasks | instruction to perform as correct and fast as possible

**5 Dark Pattern conditions**
presentation in randomized order

Baseline | Preselection | Confirmshaming | Disguised Ads | All 3 Dark Patterns

**CLASSIFICATION TASK**
NEWSFEED STIMULI




**DISTRACTING DECISION TASK**
POP-UP STIMULI


Negative Emotions (PANAS)

Feeling of being manipulated

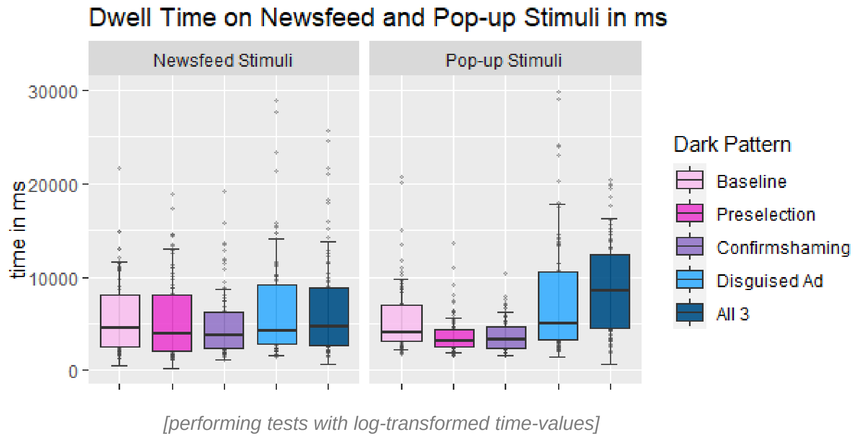
Error Rate in Classification / Decision Task

Dwell Time on stimuli

## RESULTS

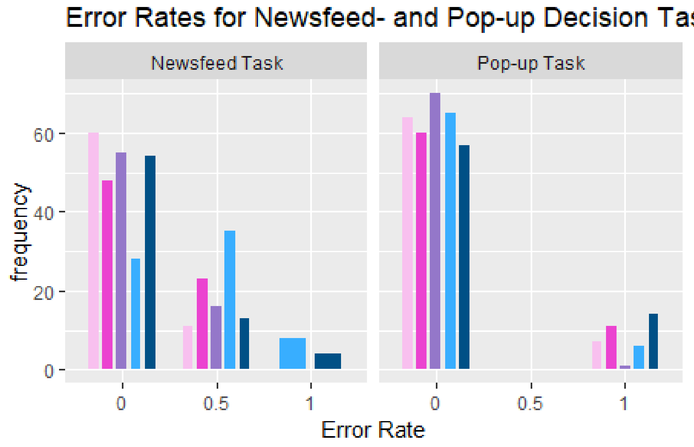
n = 79 | age: *M* = 23.75 (*SD* = 7.31) | students: 87.34 % | Analysis: Friedman test and Wilcox test for contrasts (error rate), Repeated Measure ANOVA Type III (negative emotion and time) and t-tests for contrasts, Bonferroni-Holm correction for multiple testing

Dwell Time on Newsfeed and Pop-up Stimuli in ms

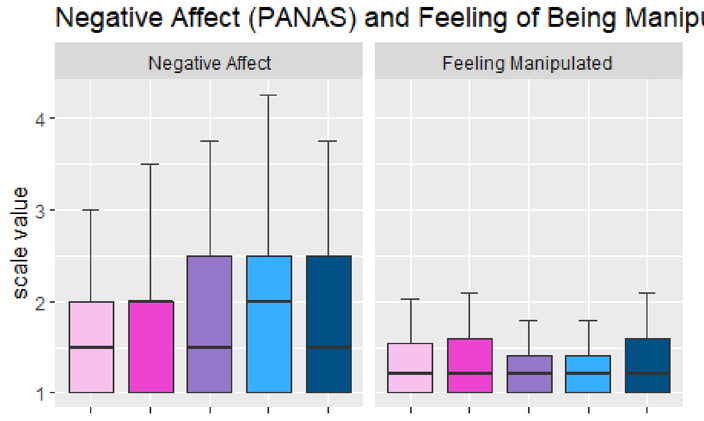



*[performing tests with log-transformed time-values]*

Error Rates for Newsfeed- and Pop-up Decision Task




Negative Affect (PANAS) and Feeling of Being Manipulated




*DISGUISED AD*
$F(3.15, 245.8) = 9.81$, $p < .001$, $\eta^2_p = 0.11$

post-hoc analysis revealed significant differences between…
All 3 vs. Baseline ($p < .01$, $d = -0.12$)
All 3 vs. Preselection ($p < .001$, $d = -0.23$)
All 3 vs. Confirmshaming ($p < .001$, $d = 0.20$)

*POP UP*
$F(3.14, 245.23) = 28.38$, $p < .001$, $\eta^2_p = 0.27$
post-hoc analysis revealed significant differences between…
Baseline vs. All 3 ($p < .001$, $d = 0.58$)
Baseline vs. Confirmshaming ($p < .001$, $d = 0.43$)
Baseline vs. Preselection ($p < .01$, $d = 0.42$)
Preselection vs. All 3 ($p < .001$, $d = -0.99$)
Preselection vs. Disguised Ad ($p < .001$, $d = -0.77$)
Confirmshaming vs. All 3 ($p < .001$, $d = 1.10$)
Confirmshaming vs. Disguised Ad ($p < .001$, $d = -0.78$)

*NEWSFEED TASK*
$\chi^2(4) = 42.574$, $p < .001$, $w = 0.15$
post-hoc analysis revealed significant differences between…
Disguised Ad vs. Baseline
($\chi^2(4) = 87.5$, $p < .001$, $w = 0.474$)
Disguised Ad vs. Confirmshaming
($\chi^2(4) = 48$, $p < .001$, $w = 0.403$)
Disguised Ad vs. All 3
($\chi^2(4) = 140$, $p < .001$, $w = 0.354$)

*POP-UP TASK*
$\chi^2(4) = 13.915$, $p < .01$, $w = 0.045$
post-hoc analysis revealed significant differences between…
Confirmshaming vs. All 3
($p < .01$, $w = 0.297$)
Confirmshaming vs. Preselection
($p < .05$, $w = 0.252$)

*NEGATIVE AFFECT*
$F(3.43, 239.77) = 1.5$, $p = 0.210$, $\eta^2_p = 0.02$

*FEELING OF BEING MANIPULATED*
$F(3.41, 265.91) = 1.78$, $p = 0.143$; $\eta^2_p = 0.02$

## DISCUSSION

- decision behavior and transaction costs (time) change, no differences in negative emotions
→ implication: more elaborated analysis of interaction between decision behavior vs. costs, more sensitive measures for emotional state necessary

- different modalities: Preselection affects decision behavior, disguised ads and combined use of the 3 dark patterns decision behavior and time effort, confirmshaming nothing at all
→ implication: considering habituation or adjustment effects to dark patterns and counteracting enhancement vs. attenuation of different patterns on behavior effects

- increased dwell time on pop-ups even in condition with no pop-up related dark patterns, slightly increased error rate
→ transfer effects of dark patterns – dark pattern in situation A can also influence behavior in situation B? More experimental studies needed

## References

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