German internet users watch less online porn on Christmas Eve and during the World Cup, and online pornography use happens in dedicated browsing sessions.

Prudish Germany? Internet pornography usage patterns in a German web-tracking panel

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Introduction

Until now, research on the use of online pornography has largely relied on self-report data. Given the sensitive nature of this topic, the use of self-report data has clear limitations. In addition, several studies have shown that self-reports of media use in general tend to be unreliable (Araujo, Wonneberger, Neijens, & de Vreese, 2017; Scharkow, 2016). For our study, we use web tracking data to explore the use of online pornography in Germany. Our theoretical framework is the Differential Susceptibility to Media Effects Model (DSMM) (Valkenburg & Peter, 2013). The DSMM generally assumes that media use and effects are transactional, and that recipients' traits, states (developmental, social, dispositional), and response states are predictors and/or moderators of media usage behavior. With regard to transactional effects, some research suggests that online pornography use is related to other types of media use, such as playing computer games (Castro-Calvo, Ballester-Arnal, Potenza, King, & Billieux, 2018).

Research Questions

RQ 1 (Predictor): How is online pornography usage affected by sociodemographic variables, such as education, age, family status, and gender?

RQ 2 (Response States): Is pornography usage behavior affected by temporal trends like weekdays, season of the year, or major societal events?

RQ 3 (Transactional): Do internet users display certain usage patterns that predict pornography usage?

Methods

We used data from a commercial web tracking panel. The panel has ~ 2000 participants per month (sample is refreshed if participants drop out). The web tracking data we have is on the domain level (e.g., youporn.com), and each domain is classified into one or more website categories by the company that collects the data. In addition to the web tracking data, we also have basic demographic information about the panelists. Our data spans the time from **June 2018 to May 2019** and includes **~ 94 million website visits** from ***N* = 3100 individuals** (50.58% female, age range: 14 to 65, *M* = 41.01, *SD* = 13.73).

Results

Sociodemographic predictors (RQ 1)

Table 1: Zero-inflated negative binomial regression model for visits to porn sites

	Negative Binomial Component			Logistic Component		
	Incident risk ratio (IRR)[1]	95%-CI	p-value	Odds ratio (OR)[2]	95%-CI	p-value
Age	1.03	1.02, 1.04	<0.001	1.05	1.04, 1.07	<0.001
Female vs. male	0.16	0.12, 0.19	<0.001	16.19	7.86, 33.32	<0.001
Education low	1.03	0.75, 1.41	0.863	0.52	0.32, 0.84	0.007
Education medium	0.71	0.56, 0.9	0.005	0.60	0.42, 0.86	0.005
In relationship	0.80	0.62, 1.02	0.071	1.18	0.85, 1.62	0.327
Has child(ren)	0.83	0.65, 1.06	0.145	1.12	0.8, 1.57	0.497

Note:
High education is the reference category for education. Vuong test of zero-inflated vs. standard negative binomial model: $z = 7.62$, $p < .001$.
[1] IRR is the ratio of mean visits when the predictor is [x+1] to mean visits when the predictor is x (holding all other variables constant). For categorical variables, the IRR is the ratio of mean visits for that category compared to the baseline category.
[2] OR is the increase or decrease in odds of never visiting a porn website when the predictor increases one unit. For categorical variables, the OR is the increase/decrease in odds compared to the reference category

Temporal trends and impact of external events (RQ 2)

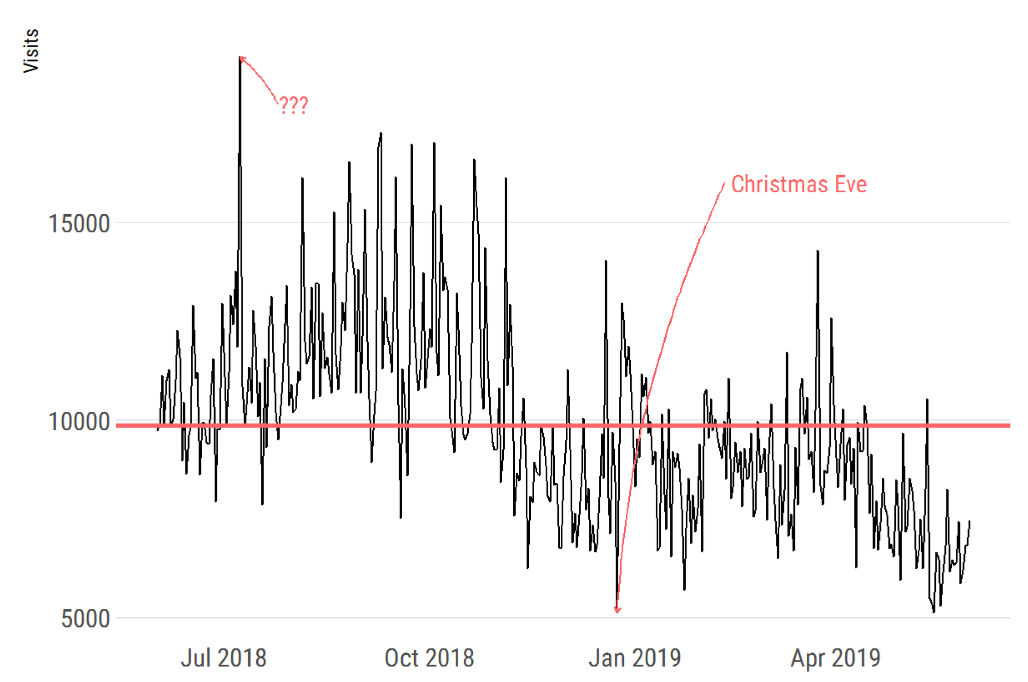

Figure 1: Total number of visits to porn websites per day June 2018 - May 2019

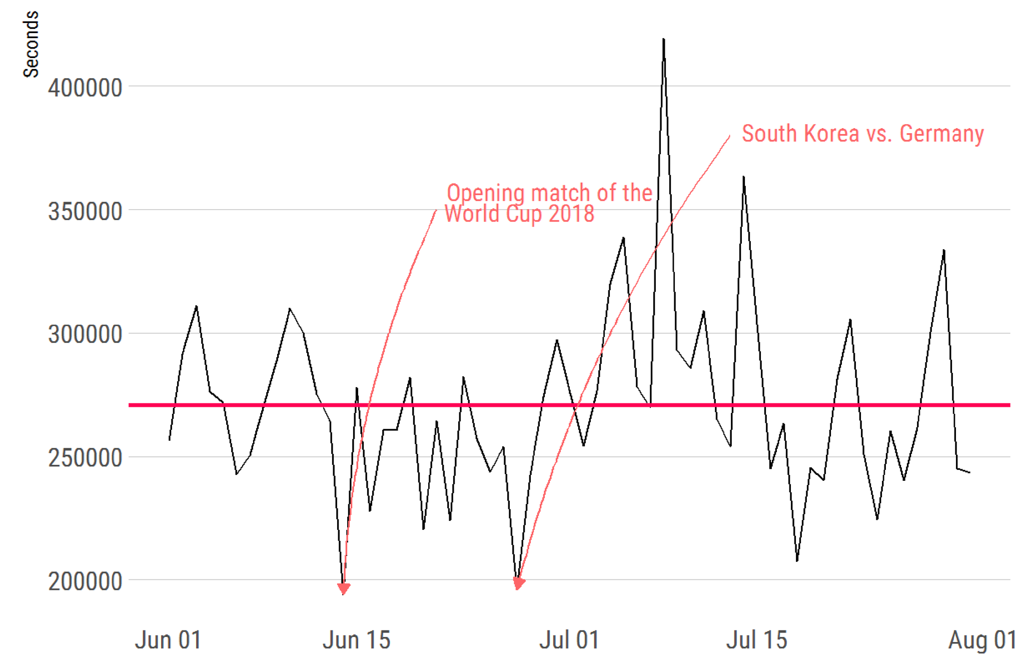

Figure 2: Total time spent on porn websites per day in June & July 2018

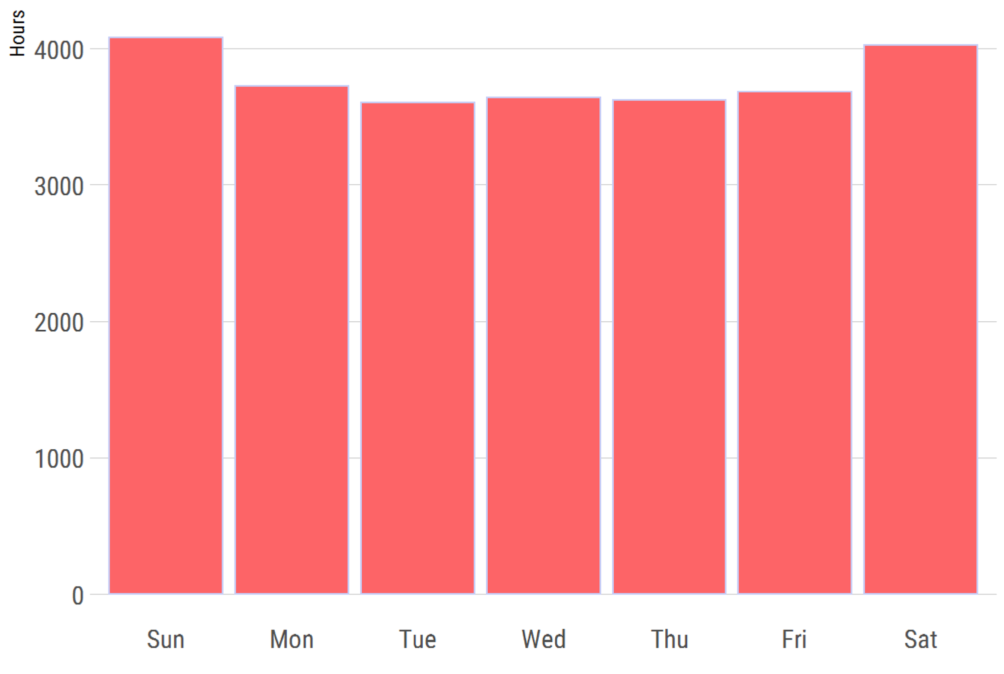

Figure 3: Total time spent on porn websites per weekday June 2018 - May 2019

Usage patterns (RQ 3)

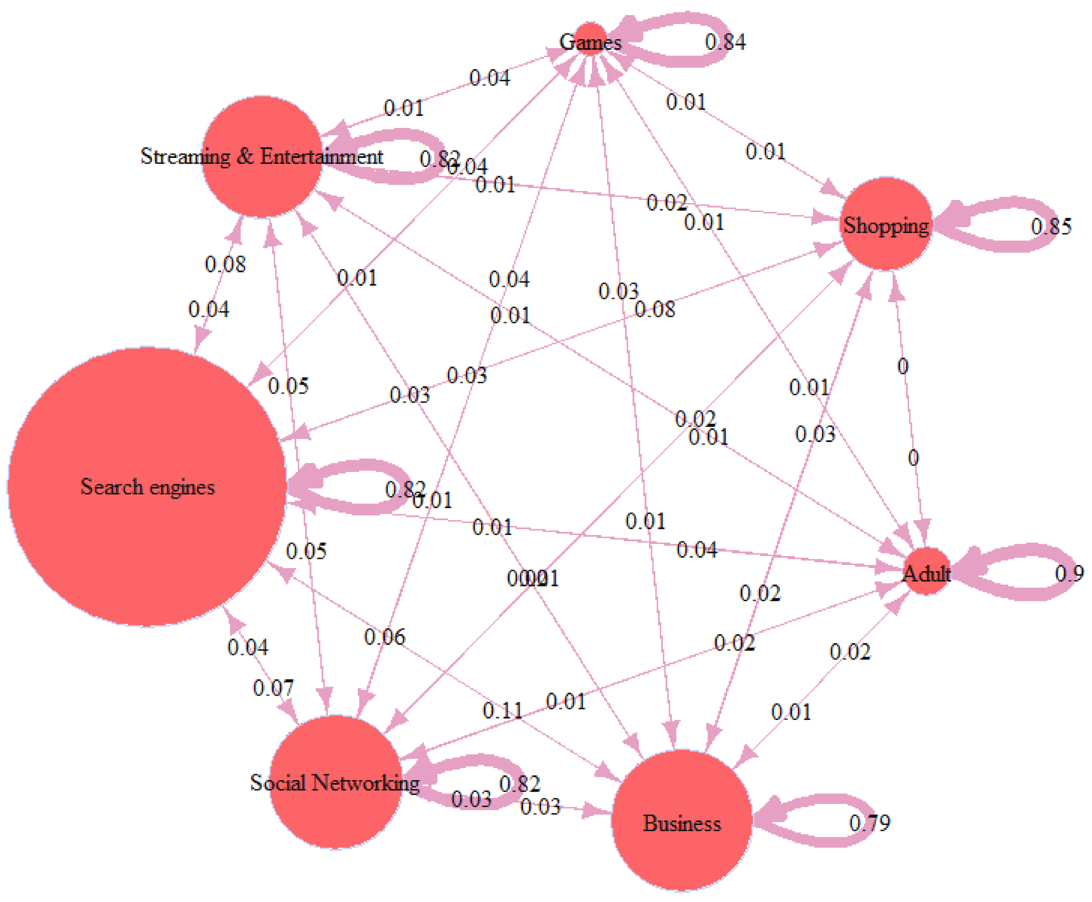

Figure 4: Transition probabilities between top website categories within browsing sessions. Data from September 2018. Node sizes reflect total number of visits.

Discussion & Outlook

Being a man is, by far, the strongest sociodemographic predictor of online pornography usage. There seem to be clear temporal patterns in online pornography use in Germany, with more use on the weekends and in the second half of the year (with the exception of December). Online pornography use is also affected by specific holidays (Christmas) and events like the World Cup. Within browsing sessions, transitions between porn websites and other types of websites are very rare, suggesting that the use of online pornography mostly happens in dedicated browsing sessions. In our next analyses steps, we want to a) include further predictors from an online survey (e.g., religiosity, sexism, moral beliefs), b) categorize porn websites (to create website & user typologies), and c) further analyze temporal patterns (both within and across sessions).

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