Awareness of Risks Related to Algorithmic Selection in Switzerland

Report 3 from the Project: The Significance of Algorithmic Selection for Everyday Life: The Case of Switzerland

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Imprint

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General Introduction to the Project

Algorithms on the internet govern our lives and our realities (Just & Latzer, 2017). They change our perception of the world and affect our behavior by influencing our choices. Consider the selection of online information via search engines, of music and video entertainment content via recommender systems, of products in online shops, or of status messages displayed on social online networks. With their governing power, algorithms on the internet have become an important source and factor of social order in digitized societies (Latzer & Just, 2020).

The benefits of this governance *by* algorithms in everyday life are accompanied by potential risks like manipulation, bias, discrimination or threats to privacy, which call for an adequate governance *of* algorithms (Latzer et al., 2016; Saurwein, Just & Latzer, 2015).

Governance *by* and governance *of* algorithms

The project "The Significance of Algorithmic Selection for Everyday Life: The Case of Switzerland" empirically explores the significance of internet-based applications that build on automated *algorithmic* selection, essentially defined as the assignment of relevance to selected pieces of information. It provides empirical evidence for assessing the possible risks and the societal groups that may be particularly affected by them. It thereby provides the basis for a more evidence-based governance of algorithms.

Empirical project on the significance of algorithmic selection for everyday life

The project is based on a representative survey of Swiss internet users conducted between December 2018 and January 2019. It is conceptually grounded in a measurement model for the significance of algorithmic selection for everyday life based on five variables (Latzer & Festic, 2019): usage of algorithmic-selection applications, the subjective significance assigned to them, awareness of algorithmic selection, awareness of associated risks, and practices to cope with these risks (see Figure 1).

Figure 1: Measurement model for the significance of algorithmic selection for everyday life

Algorithmic-selection applications serve a variety of purposes in everyday life. To reflect these diverse ways of how daily activities are influenced by algorithmic-selection applications, this project evaluates their significance in five life domains: social and political orientation, commercial transactions, socializing, entertainment, and health (see Figure 2).

Figure 2: Five domains of everyday life
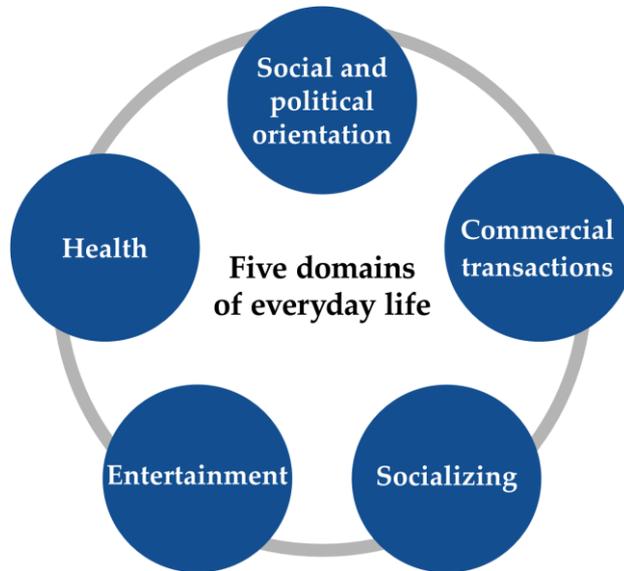
In accordance with the measurement model for the significance of algorithmic selection for everyday life, four thematic reports summarize the main results of the survey (see Figure 3):

Figure 3: Four reports on the significance of algorithmic selection for everyday life

I)	Use and Assigned Relevance of Algorithmic-Selection Applications in Switzerland.
II)	Awareness of Algorithmic Selection and Attitudes in Switzerland.
III)	Awareness of Risks Related to Algorithmic Selection in Switzerland.
IV)	Coping Practices Related to Algorithmic Selection in Switzerland.

Executive Summary – Report 3

Four out of ten internet users under 25 often think about the risk of spending too much time online

– The risks that are most thought about are spending too much time online (33%) and the danger of one-sided or distorted information on the internet (33%).

– While older internet users generally think about risks related to algorithmic selection more often, younger users think about the risk of overuse the most. Four out of ten users under 25 often think about this.

– Internet users with high educational attainment think about risks more often than users with lower levels of educational attainment do.

Half of internet users feel deceived when a bot or machine impersonates real people on the internet

– Half of internet users in Switzerland (52%) agree that they feel deceived when a machine or a program acts like a human on the internet.

– Four out of ten (41%) think that they are confronted with claims that are not true online.

– A third think that they are constantly being surveilled (35%) and that they are losing control over their data online (34%).

– Only a relatively small percentage (15%) state that their privacy has been violated on the internet.

Six out of ten would not let social media influence issues that are important to them

– Three out of ten internet users (27%) state that they generally trust online services.

– A quarter of internet users (25%) do usually not feel exposed to dangers when they are online.

– Only 14% state that they think most information on the internet is trustworthy.

– Six out of ten users (59%) would not let social media like Facebook and Instagram influence important issues if it were up to them.

– A majority would welcome a good way to keep an eye on how social media (66%) and Google Search (61%) work.

– Only a few internet users agree that they would feel comfortable assigning important tasks to Google Search, YouTube and social media.

– Trust in Google Search, YouTube and social media is lower among older users and users with high educational attainment.

1 Awareness of Risks Related to Algorithmic Selection

Using algorithmic-selection applications has been associated with many risks in public and academic debates. This report aims to analyze the extent to which internet users are aware of such risks. The survey therefore asked respondents how often they think about risks like privacy threats, bias, manipulation, surveillance, overuse and deception. Figure 4 shows how often Swiss internet users report thinking about each of these risks:

Figure 4: Awareness of risks related to algorithmic selection in Switzerland
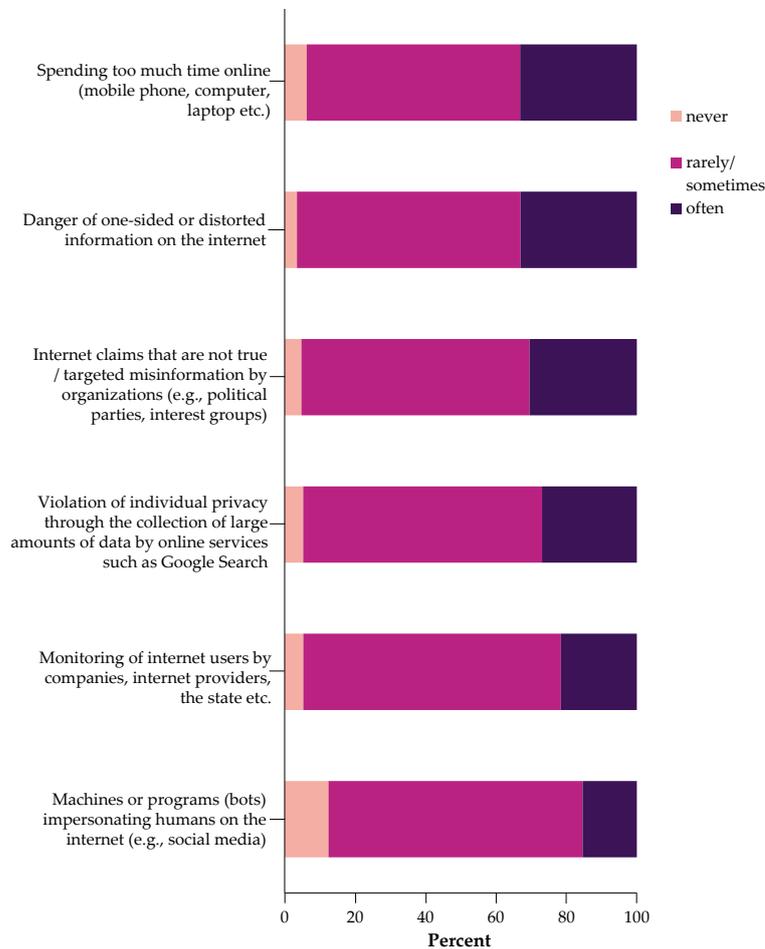
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

- Spending too much time online is one of the risks that internet users think about the most: a third of Swiss internet users (33%) often think about the risk of overuse, while six out of ten (61%) rarely or sometimes think about this risk. Only 6% never do.

- Equally widespread are thoughts about the danger of one-sided or distorted information on the internet: a third of Swiss internet users (33%) often think about it. Also, more than half of internet users (60%)

A third of Swiss internet users often think about the risk of spending too much time online

rarely or sometimes think about the risk of such biased information, and only 4% never think about it.

– Three out of ten Swiss internet users (30%) often think about risks of internet claims that are not true or targeted misinformation by organizations such as political parties or interest groups. Two thirds (65%) rarely or sometimes think about this risk and only 5% never do.

– Over a quarter (27%) of internet users indicate that they often think about violations of individual privacy through the collection of large amounts of data by services such as Google Search. Seven out of ten Swiss internet (68%) users rarely or sometimes think about privacy threats, while only 5% never think about this risk.

– Even though only a fifth (22%) of Swiss internet users often think about the monitoring of their online activities by companies, internet providers or states, the majority (73%) sometimes or rarely think about this risk. Only 5% of Swiss internet users state that they never think about the risk of online surveillance.

– Being deceived by machines or bots impersonating humans is a risk that users are comparatively not as worried about: only 15% of internet users often think about it. 72% think about this risk rarely or sometimes and one out of ten users (13%) state that they never think about the risk of bots impersonating humans. These results are in line with the finding that a third of Swiss internet users (35%) are unaware or unsure about whether companies make use of bots to communicate with their customers (see Report 2).

There are some noteworthy differences across age groups regarding the awareness of risks related to using algorithmic-selection applications:

A third often think about the danger of one-sided information online

Three quarters of internet users do not often think about the risk of bots online

Figure 5: Awareness of risks related to algorithmic selection by age
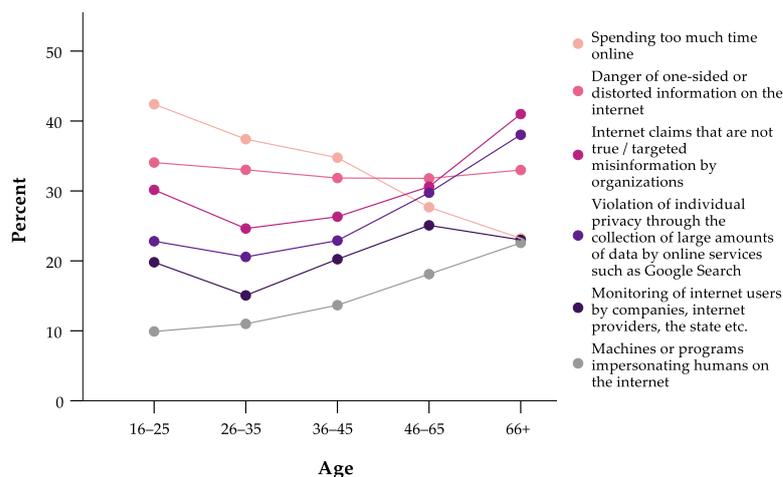
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– Older internet users think about the risk of spending too much time online less than younger users do. While 43% of those between the ages of 16 and 25 often think about the risk of overuse, only 27% of those aged between 46 and 65 do so.

– When it comes to targeted misinformation by political organizations, the oldest group aged 66 and over think about this issue most often (42%). Only a quarter (25%) of users between 26 and 35 often think about this risk.

– The possibility of being monitored by companies is an issue which is not very salient across all age groups, as both young and older users do not often think about this risk. Only 15% of users between 26 and 35 often think about this risk. At the same time, slightly less than a quarter of the oldest group (23%) do so.

– Users aged 66 and over think about the risk of violation of individual privacy through the collection of large amounts of data most often (38%). Only 21% of those aged between 26 and 35 often think about this risk.

– Only one out of ten of the youngest group aged between 16 and 25 (10%) often thinks about the risk of being deceived by machines or bots pretending to be humans. Meanwhile, a quarter of the oldest group aged 66 and over (23%) attest to the same.

Internet users with different levels of educational attainment do not equally often think about risks associated with using algorithmic-selection applications:

Figure 6: Awareness of risks related to algorithmic selection by educational attainment
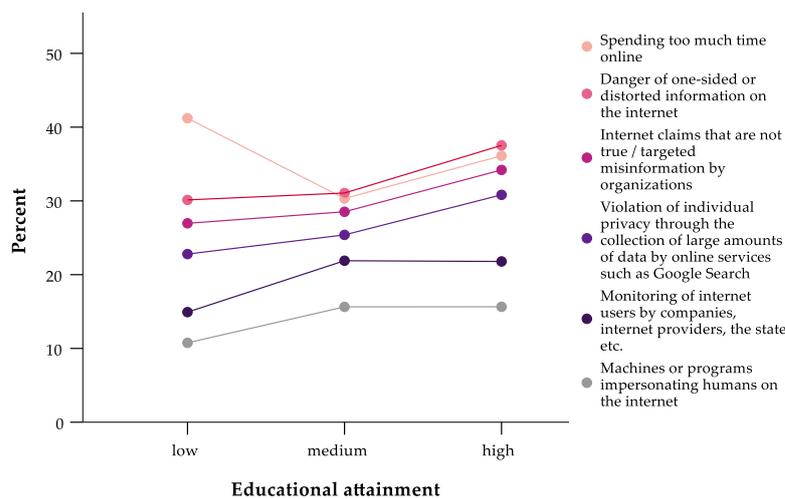
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– Internet users with high educational attainment think about the various risks slightly more often, but the differences are small. For instance, while a quarter of those with low educational attainment (24%) often think about the risk of violation of individual privacy, 31% of the highly-educated do so.

Younger internet users think about the risk of digital overuse more often

Older internet users generally think about risks related to algorithmic selection more often

High-educated internet users think about risks associated with algorithmic selection slightly more often

– While 15% of users with low levels of educational attainment often think about monitoring by companies and organizations, 22% of users with medium levels of educational attainment do so.

– However, more internet users with low levels of educational attainment (42%) often think about the risk of spending too much time online. A third of the highly-educated internet users (36%) express the same sentiment.

Thinking about the risk of overuse is widespread among young users and users with a low educational attainment. Many young internet users have not completed their education yet, which is why they are assigned a low level of educational attainment. Therefore, age and educational differences cannot always be clearly distinguished in this case.

The awareness of risks related to algorithmic selection differs between male and female internet users in Switzerland:

– Slightly more women (36%) than men (30%) often worry about spending too much time on the internet.

– However, while 26% of women often think about internet claims that are not true or targeted misinformation by political organizations, 35% of men do so.

– Similarly, 17% of women often think about the risk of being monitored by companies, internet providers or the state, while more than a quarter (26%) of men do so.

More men than women often think about most risks associated with algorithmic selection

Additionally, higher knowledge of algorithmic selection and better understanding of related terms (see Report 2) significantly correlates with thinking about risks related to algorithmic-selection more often.

Risk awareness increases with higher awareness of algorithmic selection

While this section dealt with how often Swiss internet users think about risk associated with using algorithmic-selection applications, the respondents were then also asked whether they have actually made such negative risk-related experiences during their daily internet use. The next section addresses these questions.

2 Negative Experiences with Risks Related to Algorithmic Selection

The respondents were then asked whether they have actually had such negative experiences. Figure 7 shows the percentage of Swiss internet users who agree or strongly agree with these statements:

Figure 7: Negative experiences with risks related to algorithmic selection in Switzerland
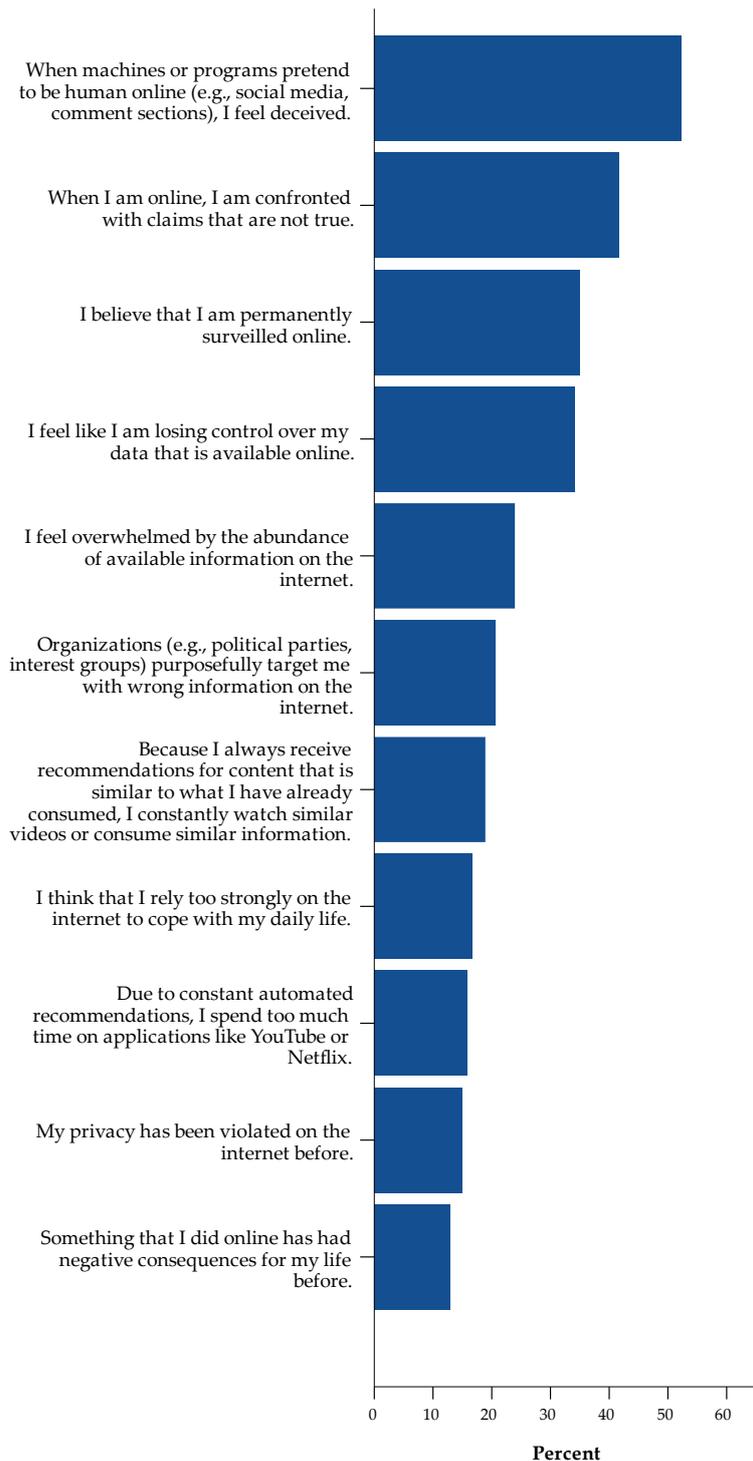
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– The most common negative experience related to algorithmic selection among internet users is feeling deceived when machines and programs pretend to be human: half of Swiss internet users (52%) have experienced this. At the same time, only 15% of internet users often think about this type of risk (see Figure 4). In addition, a third (36%) are unsure about how and when bots are used (see Report 2).

– Four out of ten (41%) Swiss internet users think they are confronted with claims that are not true online.

– Furthermore, a third of internet users (35%) believe that they are permanently surveilled online. The vast majority of them (87%) think that they are being monitored by applications such as Google Search and Facebook or by their internet providers. A quarter (25%) think they are being surveilled by the state or intelligence agencies and a fifth (20%) perceive surveillance by other people on the internet (multiple responses were allowed).

– A third of Swiss internet users (34%) feel like they are losing control over their own data that is available online.

– A quarter (23%) also feel overwhelmed by the abundance of available information online.

– Two out of ten users (20%) feel that organizations such as political parties or interest groups purposefully target them with wrong information on the internet.

– Equally as many (18%) think that they constantly watch similar videos or consume similar information because they always receive recommendations for content that is similar to what they have already consumed.

– Only 16% of Swiss internet users think that they rely too strongly on the internet to cope with their daily lives.

– Also, only 16% of users of Netflix and YouTube think that they spend too much time on these applications due to constant automated recommendations. At the same time, a third of internet users (33%) state that they often think about the risk of spending too much time online (see Figure 4).

– Only 15% of internet users say that their privacy has been violated on the internet before.

– One out of ten (13%) have experienced negative consequences for their lives because of something they did online. Half of them have suffered from financial and economic consequences such as losing money or other things that have affected their job or career (48%), or from social consequences such as being bullied (47%).

There are some differences across age and educational groups with regard to these negative experiences related to using algorithmic-selection applications. Figure 8 contains all experiences for which age differences were found:

Half of Swiss internet users feel deceived when machines or programs pretend to be human

A fifth of Swiss internet users feel targeted with wrong information online

Figure 8: Negative experiences with risks related to algorithmic selection by age

When machines or programs pretend to be human online, I feel deceived.

When I am online, I am confronted with claims that are not true.

I feel like I am losing control over my data that is available online.

Because I always receive recommendations for content that is similar to what I have already consumed, I constantly watch similar videos or consume similar information.

Due to constant automated recommendations, I spend too much time on applications like YouTube or Netflix.

My privacy has been violated on the internet before.

Something that I did online has had negative consequences for my life before.

Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– In many cases, the oldest age group has had the fewest risk-associated negative experiences. At the same time, however, older users think about the different risks related to algorithmic selection most often.

– For example, while a third of internet users aged between 16 and 25 (34%) think that they constantly watch similar videos or consume similar information because they always receive recommendations for content that is similar to what they have already consumed, only 9% of those aged 66 and over agree.

– Spending too much time on applications like YouTube or Netflix due to constant automated recommendations is also an issue that mostly concerns the youngest group, 16–25 (30%). Older users are less affected: only 9% of internet users aged 46 and over experience this.

– A third of the youngest internet user group (35%) indicate relying on the internet too much to cope with their daily lives. Only 3% of the oldest group aged 66 and over agree that this is the case for them.

– While a third of the youngest group (33%) feel like they are under permanent surveillance online, half (50%) of internet users between 26 and 35 feel the same.

– Losing control over one's data that is available online is a negative experience that internet users between the ages of 26 and 35 agree with most (40%; 35% for ages 16–25).

– The 36–45 age group feel their privacy is violated the most (21%). Only 11% of the oldest group (66+) and 16% of the youngest group (16–25) state the same.

– There is one exception to this trend concerning age: Among all age groups, the oldest, aged 66 and over, feel most deceived to the largest extent by bots and programs pretending to be human (57%). In comparison, 46% of the youngest age group of 16–25 feel the same way.

Young users have more negative experiences related to algorithmic selection on the internet but think about risks less

Feeling deceived by bots pretending to be human is more common among older users

Swiss internet users with different levels of educational attainment also differ in their negative experiences with algorithmic selection. Figure 9 contains all experiences for which differences were found:

Figure 9: Negative experiences with risks related to algorithmic selection by educational attainment
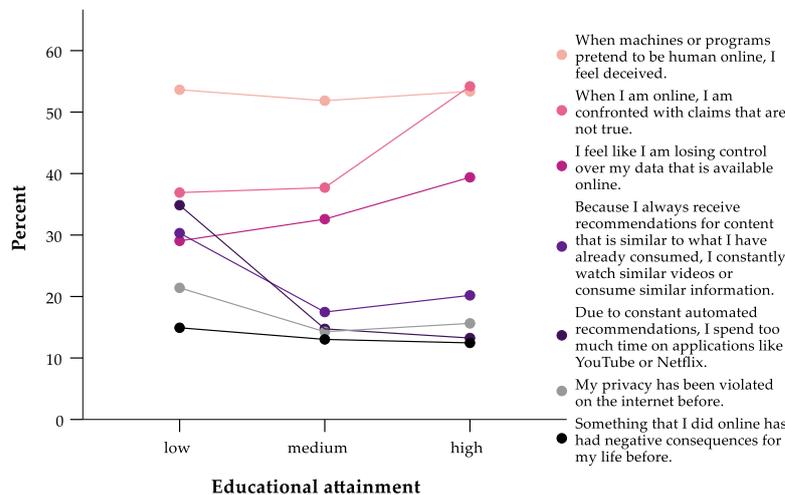
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– Internet users with high educational attainment have had some of these negative experiences more often. For example, while 37% of internet users with low educational attainment state that they have been confronted with untrue claims on the internet, more than half of the highly-educated ones (54%) say the same.

– The same trend can be observed regarding loss of control over one's data that is available online. Users with high levels of educational attainment (40%) have experienced this more than users with low levels of educational attainment (29%).

– More low-educated users have had negative experiences related to internet overuse. For instance, those with low educational attainment (35%) feel to a larger extent that they spend too much time on applications such as Netflix or YouTube due to automatized recommendations than those with medium (15%) or high educational attainment (13%).

– Internet users with low educational attainment (28%) also agree that they depend too heavily on the internet to cope with their daily lives most. Only 16% of the highly-educated internet users attest to the same.

Generally, there are no substantial differences between men and women in having negative risk-related experiences.

– For instance, 17% of men and 16% of women feel that they depend too heavily on the internet to cope with their daily lives. Women (26%) and men (22%) also agree to a similar degree that they are overwhelmed by the abundance of information on the internet.

– However, while only 15% of women think that organizations purposefully target them with false information, 26% of men think so.

Negative experiences related to digital overuse are more common among low-educated users

Men experience purposeful misinformation online more

3 Trust in the Internet and Algorithmic-Selection Applications

Besides analyzing the extent to which internet users are aware of risks related to algorithmic selection and to what degree they have actually had such negative experiences, this report aims at investigating trust in online content and services, including algorithmic-selection applications. Figure 10 shows the percentage of Swiss internet users who agree or strongly agree with the different statements on trust in the internet in general:

Figure 10: General trust in the internet in Switzerland
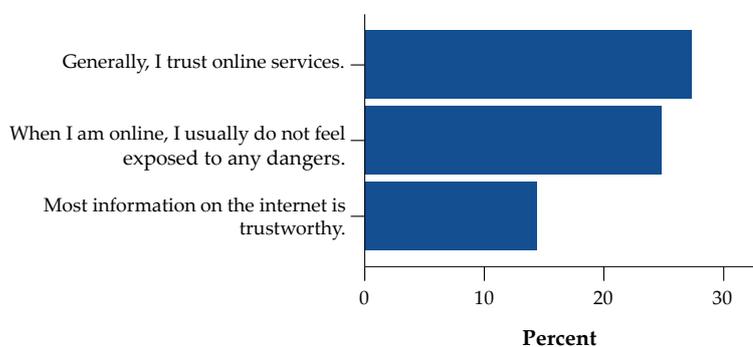
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– Generally, trust in the internet seems to be very low among Swiss internet users.

– Only a quarter of Swiss internet users generally trust online services (27%) and do not feel exposed to any dangers when they are online (25%).

– Even fewer (14%) agree that most information on the internet is trustworthy.

Trust in the internet varies between different societal groups:

– General trust in online services is the lowest among members of the oldest age group aged 66 and over (23%) and the highest for internet users between 26 and 35 (33%).

– While only a fifth (19%) of those aged between 46 and 65 usually do not feel exposed to any dangers online, a third (33%) of users between 16 and 25 feel the same.

– Internet users across all age groups are equally skeptical about the trustworthiness of online information (e.g., 16–25: 16%, 46–65: 15%).

– Trust in online information is lower among internet users with high educational attainment: whereas two out of ten (20%) users with low educational attainment think online information is trustworthy, only 12% of the highly-educated do.

Only one out of ten thinks most information on the internet is trustworthy

Trust in the internet is lower among older internet users

**Highly-educated users trust online information less**

–Internet users with low (30%), medium (24%) and high educational attainment (27%) do not usually feel exposed to any dangers on the internet to a similar degree.

–Men trust online services (30%) and online information (16%) slightly more than women do (24% and 12%, respectively). Both men (26%) and women (23%) mostly do not feel exposed to any dangers on the internet.

Trust in online services and information on the internet is lower among women

After having examined general trust in online services and information online, this report provides a more detailed analysis of how trust varies across online applications that are based on algorithmic selection. The following section differentiates between trust in YouTube, Google Search and social media platforms such as Facebook and Instagram. The respondents were asked a variety of questions regarding their levels of trust in these three online applications, regardless of whether they use the application or not.[1] Figure 11 shows the percentage of Swiss internet users who agree or strongly agree with different statements concerning trust:

[1] These questions were adapted from Mayer & Davis (1999).

Figure 11: Trust in algorithmic-selection applications in Switzerland
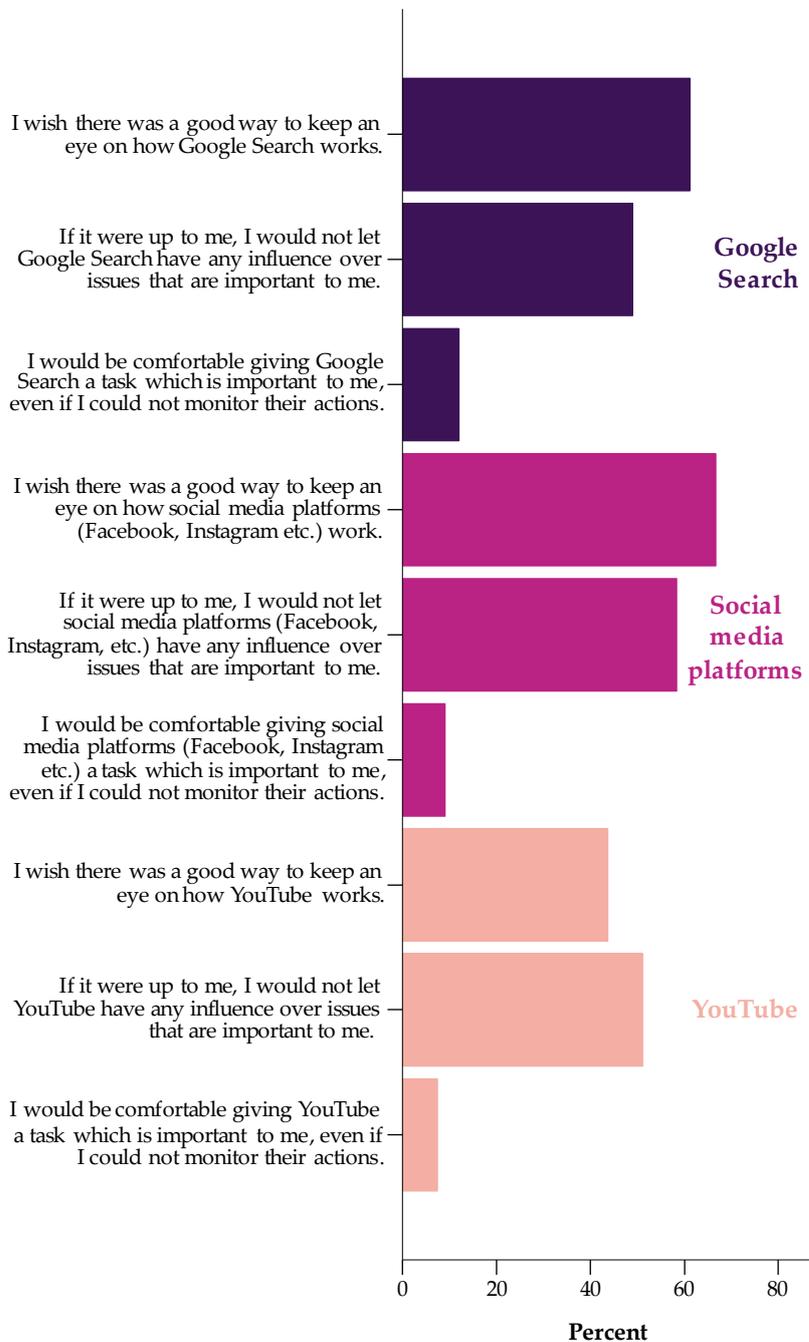
Data basis: n=1202, Swiss internet users aged 16 and over, 2019.

– With regard to Google Search, six out of ten internet users (61%) wish that there was a good way to keep an eye on how it works. Half of Swiss internet users (49%) would not let Google Search have any influence over issues that are important to them if it were up to them. Only one out of ten (12%) would feel comfortable giving Google Search a task which is important to them without being able to monitor their actions.

Six out of ten internet users wish there was a good way to keep an eye on how Google Search works

– Two thirds of Swiss internet users (66%) wish they were able to keep an eye on how social media work. Six out of ten Swiss internet users (59%) would not let social media have any influence over issues that are important to them if it were up to them. Only one out of ten (10%) would give tasks that are important to them to social media, knowing that they are not able to monitor their actions. [2]

– Fewer internet users (43%) are interested in keeping an eye on how YouTube works than is the case for Google Search and social media. Half of Swiss internet users (51%) would not let YouTube have any influence over issues that are important to them. Furthermore, only 7% are willing to give YouTube a task that is important to them, knowing they could not monitor YouTube's actions.

There are some differences regarding trust in algorithmic-selection applications with regard to age, educational attainment and gender:

– Trust in Google Search is lower among older internet users. For example, more users aged 66 and over (62%) wish that Google Search had no influence over issues that are important to them than users aged 16 to 25 (37%).

– Similarly, trust in social media is lower among older internet users. For example, the desire to monitor how social media work is highest among those aged 46 and over (72–74%) and lowest among those up to 35 (60%).

– Trust in YouTube is also lower among older users. For instance, the willingness to give important tasks to YouTube is lower among older users (e.g., 66+: 7%) than among young users (e.g., 16–25: 14%).

– Internet users with high educational attainment trust Google Search, YouTube and social media less. For instance, while six out of ten Swiss internet users with low educational attainment (59%) would like to be able to keep an eye on how social media platforms work, among the highly-educated, seven out of ten (72%) would like to do so.

– There are no major differences between women and men with regard to trust in Google Search, YouTube and social media. For example, 57% of women and 60% of men would not let social media have any influence over issues that are important to them.

Six out of ten would not let social media have any influence over issues that are important to them

Trust in algorithmic-selection applications is greater among young and low-educated users

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[2] Internet users' wish for more control over algorithmic-selection applications like Google Search or social media has also been found in Germany as well as in the EU in general (Fischer & Petersen, 2018; Grzymek, & Puntschuh, 2019).

Methods

This study is based on a representative online survey of Swiss internet users. The sample of 1202 people is representative of Swiss internet users aged 16 and over by age, gender, language region, household size, and employment status. The data was collected by an independent market-research company, the LINK Institute, between 27 November 2018 and 23 January 2019 in three languages (German, French and Italian).

Representative survey of Swiss internet users

The participants were recruited from an existing internet panel (LINK internet panel) and received a small pecuniary incentive for their participation.

Online survey with panel sample

The sample was composed slightly disproportionately in order to enable separate analyses for smaller population groups. To balance this disproportion compared to the general population, the data was weighted with regard to age, gender, language region, household size, and employment status.

The survey lasted 30 minutes on average. The response rate was 76%.

Online surveys in absolute numbers:

Age	Total	German-speaking	French-speaking	Italian-speaking
16–25	211	146	58	7
26–35	225	169	49	7
36–45	210	142	57	11
46–65	422	308	97	17
66–85	134	100	28	6
	1202	865	289	48

Further Literature

Araujo, T., de Vreese, C., Helberger, N., Kruikemeier, S., van Weert, J., Bol, N., … Taylor, L. (2018). Automated Decision-Making Fairness in an AI-driven World: Public Perceptions, Hopes and Concerns. Digital Communication Methods Lab. https://pure.uva.nl/ws/files/29049625/20180925_AD-MbyAI.pdf

Fischer, S. & Petersen, T. (2018). Was Deutschland über Algorithmen weiss und denkt. Ergebnisse einer repräsentativen Bevölkerungsumfrage. Bertelsmann Stiftung. https://doi.org/10.11586/2018022

Grzymek, V. & Puntschuh, M. (2019). Was Europa über Algorithmen weiss und denkt. Ergebnisse einer repräsentativen Bevölkerungsumfrage. Bertelsmann Stiftung. https://doi.org/10.11586/2019006

Just, N. & Latzer, M. (2017). Governance by algorithms: reality construction by algorithmic selection on the Internet. *Media, Culture & Society, 39 (2)*, 238-258. https://doi.org/10.1177%2F0163443716643157

Latzer, M., Büchi, M., & Festic, N. (2019). Internetverbreitung und digitale Bruchlinien in der Schweiz 2019. Themenbericht aus dem World Internet Project – Switzerland 2019. Zürich: Universität Zürich. http://mediachange.ch/research/wip-ch-2019

Latzer, M. & Festic, N. (2019). A guideline for understanding and measuring algorithmic governance in everyday life. *Internet Policy Review, 8(2)*. https://doi.org/10.14763/2019.2.1415

Latzer, M., Festic, N., & Kappeler, K. (2020). Awareness of Algorithmic Selection and Attitudes in Switzerland. Report 2 from the Project: The Significance of Algorithmic Selection for Everyday Life: The Case of Switzerland. Zurich: University of Zurich. http://mediachange.ch/research/algosig

Latzer, M., Festic, N., & Kappeler, K. (2020). Awareness of Risks Related to Algorithmic Selection in Switzerland. Report 3 from the Project: The Significance of Algorithmic Selection for Everyday Life: The Case of Switzerland. Zurich: University of Zurich. http://mediachange.ch/research/algosig

Latzer, M., Festic, N., & Kappeler, K. (2020). Coping Practices Related to Algorithmic Selection in Switzerland. Report 4 from the Project: The Significance of Algorithmic Selection for Everyday Life: The Case of Switzerland. Zurich: University of Zurich. http://mediachange.ch/research/algosig

Latzer, M., Hollnbuchner, K., Just, N. & Saurwein, F. (2016). The economics of algorithmic selection on the Internet. In: Bauer, J. and Latzer, M. (Eds.), *Handbook on the Economics of the Internet*. Cheltenham, Northampton: Edward Elgar, 395-425.

Latzer, M. & Just, N. (2020). Governance by and of algorithms on the internet: impact and consequences. In: *Oxford Research Encyclopedia of Communication.* Oxford: Oxford University Press. https://doi.org/10.1093/acrefore/9780190228613.013.904

Mayer, R. & Davis, J. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment. *Journal of Applied Psychology, 84* (1), 123–136.

Perrin, A. & Anderson, M. (2019). Share of U.S. adults using social media, including Facebook, is mostly unchanged since 2018. Pew Research Center. https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/

Saurwein, F., Just, N. & Latzer, M. (2015). Governance of algorithms: options and limitations. *info, 17 (6)*, 35-49. https://ssrn.com/abstract=2710400

Schmidt, J.-H., Merten, L., Hasebrink, U., Petrich, I., & Rolfs, A. (2019). How do intermediaries shape news-related media repertoires and practices? Findings from a qualitative study. *International Journal of Communication, 13*, 853–873. https://ijoc.org/index.php/ijoc/article/view/9080

Urech, M. (2018). Wer sich bewegt zahlt weniger Prämien. Netzwoche. https://www.netzwoche.ch/storys/2018-09-18/wer-sich-bewegt-zahlt-weniger-praemien