



Young people's media use and adherence to preventive measures in the "infodemic": Is it masked by political ideology?[☆]

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ABSTRACT

Background: Navigating in the COVID-19 "infodemic" and adhering to preventive measures is especially challenging for young people. The use of information sources and political ideology are empirically important factors for adherence behavior. How these two are interconnected and if political ideology on its own contributes to adherence is not yet well established in young people.

Objective: This study investigates what role political ideology and political extremism, use of information sources, trust and risk perception play for adhering to preventive measures in young people.

Methods: Cross-sectional online survey in a representative random sample of young people aged 15–34 in two German-speaking and one Italian-speaking canton of Switzerland. The hypotheses were tested with logistic regression and multivariate regression analysis.

Results: The odds for using the following information sources decreases for young people positioning themselves towards the right pole of the ideology scale: health-based sources 0.90 (CI: 0.84–0.97), news sources 0.93 (CI 0.87–0.997) and other websites 0.83 (CI: 0.75–0.92). In contrast, the odds of using broadcasting sources increases for young people positioning themselves towards the right pole of the ideology scale (OR: 1.08, CI 1.01–1.15). The odds of using social media decreases with higher political extremism (OR 0.88, CI 0.78–0.99). Political extremism was related with lower adherence to preventive measures in young people with low trust in the government, scientists, and journalists.

Conclusion: Young peoples' use of information sources is associated with their political ideology and political extremism needs to be taken in account in conjunction with low trust.

1. Introduction

In February 2020, the World Health Organization (WHO) declared the COVID-19 pandemic an "infodemic", which meant that too much correct and incorrect information was spread, making it hard for people to identify trustworthy information (World Health Organization, 2020). It is a substantial challenge for the authorities to communicate information that is easily understood and take preventive measures that are accepted by a large part of the population in the middle of an

"infodemic". For young people, the challenge of navigating the "infodemic" and understanding what they needed to do, when and why, was especially challenging, and this is mirrored by a lower adherence of young people to preventive measures (Barari et al., 2020; Park et al., 2020).

Information-seeking behavior plays an important role in affecting people's adherence to the measures (Jardine et al., 2015; Liu, 2020; Ludolph et al., 2018; Pedersen and Favero, 2020), and young people's use of information sources in a pandemic context differs from their usual

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information-seeking behavior. A cross-sectional study of Norwegian adolescents shows that young people most often used television and their families as information sources during the COVID-19 pandemic (Riiser et al., 2020). In a Swiss study on information sources on COVID-19, 52% of young people aged 15–34 years used television, 44% used the internet, 38% used radio, and 36% used social media as the main information sources on COVID-19 (Sotomo, 2020).

Considerable research has indicated that political ideology may have an impact on how the general public perceives the COVID-19 pandemic and the preventive measures and how well measures induced by the government are followed (Barbieri and Bonini, 2020; Brouard et al., 2020; Deopa and Fortunato, 2021; Grossman et al., 2020; Makridis and Rothwell, 2020; Painter and Qiu, 2020). However, it is less clear whether political ideology and COVID-19 information-seeking are linked to determine the adherence behavior in young people.

While Geana et al. (2021) argued that political ideology should become a standard health determinant in studies on health behavior, few European studies are available on the role of ideology in adherence to governmental COVID-19 measures for young people. Oosterhoff and Palmer (2020) found that social responsibility and self-interest were primarily associated with social distancing, news monitoring, and hoarding behavior among U.S. adolescents. Social responsibility and self-interest correlated with political ideology, but political ideology showed no independent effect. Other important factors for adherence to measures by young people are trust in the government (Mathews et al., 2021; Nivette et al., 2020), the media (Rieger, 2020), and risk perceptions (Oosterhoff and Palmer, 2020; Rayani et al., 2021). These factors change over time. For example, during the lockdown in spring 2020, many people in Switzerland favored the government's prevention measures and expressed a high level of trust in the government (Bosshard et al., 2020). However, little is known about how risk perceptions and trust are related to political ideology and adherence behavior among young people.

This paper addresses these gaps by analyzing survey data about the COVID-19 pandemic from a random representative sample of young people aged 15–34 years living in three Swiss cantons.

1.1. Information-seeking behavior and political ideology

Political ideology has been defined as a “set of beliefs about the proper order of society and how it can be achieved” (Erikson and Tedin, 2000, p. 70), whereas political extremism is “the extent to which regular citizens are polarized into, and strongly identify with, generic left- or right-wing ideological outlooks on society” (van Prooijen and Krouwel, 2019, p. 159). In Western Europe, right-wing orientation is associated with conservatism and the acceptance of inequality, while left-wing orientation is associated with openness to experience (Thorisdottir et al., 2007).

Recent research suggests that political ideology could act as a mediating factor in people's media consumption in pandemic situations. As noted by Bavel et al. (2020), political polarization may trigger differing perceptions about the pandemic as people select their news sources according to their political ideology. People's networks are becoming increasingly homophilic, which means that people increasingly connect with like-minded people and are less willing to experience differing viewpoints (McPherson et al., 2001). The selective exposure effect postulates that people prefer information that aligns with their beliefs, while information deviating from their beliefs is not completely avoided (Valentino and Nardis, 2013).

Outside the pandemic context, Eurobarometer data reveal evidence that the slant of media outlets that people consume interacts with their political ideological views and impacts their perceived trust in the government. Consuming media not in favor of the government has a strong impact and decreases trust in the government for those who have ideological positions that are not congruent with the government (Ceron and Memoli, 2015). In terms of the causal direction of the relationship,

Stroud (2010) suggested that media exposure increases political polarization. In a web-tracking study, people with populist attitudes use less news from the legacy media and more hyper-partisan news (Stier et al., 2020). Thus, political ideology may influence which media people use to inform themselves in general and for COVID-19, in particular, as demonstrated by Romer and Jamieson (2021): conservative people use more conservative media and less mainstream news and believe more in pandemic conspiracy theories.

Following the assumptions of selective exposure, it can be expected that young people consult their preferred information channels, which are consistent with their political ideology:

Hypothesis 1. Young people use different information sources to acquire information about COVID-19, depending on their perceived political ideology or political extremity.

1.2. Adherence to preventive measures

1.2.1. Political ideology

Politically ideological views are already established in young people's attitudes. In eight European countries, Hooghe and Wilkenfeld (2008) found that attitudes toward immigrant rights are already pronounced for adolescents aged 14 years old, whereas intention to vote and voting behavior are less stable at this age. Young people may also react to threats to the social system with a conservative shift and may develop a preference for order and structure (van der Toorn et al., 2017). The preventive measures against COVID-19 could evoke fears that the strong liberal values in Switzerland, such as personal freedom, are in danger. Bavel et al. (2020) stated that political polarization influences behavioral change in the pandemic. In particular, affective polarization, which is characterized as aversion to political opponents, can lead to decreasing trust and the spread of misinformation (Bavel et al., 2020). Although Switzerland's political system is characterized by a consensus democracy, there is a tendency for increased polarization of Swiss political parties (Vatter, 2016). Thus, we hypothesize that extreme political orientation is associated with less adherence to preventive measures.

Hypothesis 2. Young people with a more self-perceived political orientation at the extreme follow the recommended preventive COVID-19 measures less than people with a less self-perceived political orientation at the extreme.

1.2.2. Risk perception and political ideology

Risk perception is seen as an important element in several health behavior theories, such as the health belief model, protection motivation theory, and the health action process approach (Gaube et al., 2019). For instance, in the health belief model, perceived susceptibility towards a condition and expected serious personal consequences drive the individual to act preventively against that condition when several other prerequisites such as perceived benefits of the preventive behavior are met (Rosenstock, 1966). Political leaders or the media downplaying the dangers of a COVID-19 infection affect people's own risk perception and behavior toward preventive measures. The same facts about the pandemic, such as case numbers, can therefore generate different risk perceptions depending on the political lens under which they are seen (Barrios and Hochberg, 2020). Thus, we examined whether political extremity interacts with risk perception to predict adherence to preventive measures.

Hypothesis 3. Young people with a self-perceived political orientation at the extremes are less likely to follow the recommended preventive COVID-19 measures when they perceive a low COVID-19 risk than when they perceive a high risk.

1.2.3. Trust and political ideology

Research in the Netherlands shows that extreme left and extreme right positions are associated with greater distrust in politics (Kutiyski

et al., 2020). During the COVID-19 pandemic, populist discourses spread about distrusting elites and experts, such as scientists (Barbieri and Bonini, 2020; Kavakli, 2020; Nivette et al., 2020). The perception that the media exaggerate the severity of COVID-19 reflects an example of this general distrust (Calvillo et al., 2020). Therefore, we examined whether political ideology interacts with trust in the government, media, and scientists to predict adherence to preventive measures.

Hypothesis 4. Young people with a self-perceived political orientation at the extreme are less likely to follow the recommended preventive COVID-19 measures when they have low trust in government, media, and scientists than when they have high trust.

2. Data and methods

2.1. Study sample

This paper analyzes data from the COVIDisc project—discussion with young people about the COVID-19 pandemic. COVIDisc investigates how young people aged 15–34 years perceive the discussion during the COVID-19 pandemic, including the messages that reached them, the media they used to inform themselves, and the experience they had of the situation. To this end, the perspective of young people was surveyed. The data set and analysis scripts used for this publication are available (Juvalta et al., 2022). A representative random sample of persons aged 15–34 living in the cantons of Zurich, Thurgau, or Ticino was included. The selection of cantons was based on the COVID-19 cases in the first wave of the pandemic. The Canton Ticino was profoundly hit by COVID-19 in the first wave, and the Canton of Zurich had the highest infection rates for the German-speaking part of Switzerland, but on a much lower level than Ticino. In contrast, the Canton Thurgau had very few cases during the first wave. The Federal Statistical Office (FSO) drew a random sample of people aged 15–34 years on January 1, 2020, and living in the cantons of Zurich, Thurgau, or Ticino ($N = 3597$; 1812 from Thurgau and Zurich and 1785 from Ticino). For our analyses, we aimed for a power of 0.8 and a level of significance of 0.05. To detect a difference of 10% in media use or following preventive measures between the language regions, a sample size of a minimum of 500 participants was needed (two-sided z-test). We aimed for 600 participants in each language region, overall 1200 participants to provide us with sufficient power to detect meaningful differences in both information use and behavior.

2.2. Survey instrument

The questions for the online survey (see Supplement 1) were developed for the project by the multidisciplinary project team consisting of scientists of health communication, sociology, psychology, public health, and health behavior. Whenever available, validated items were used. The survey comprised 44 items covering the use of information sources on COVID-19, trust in information sources, COVID-19 specific health literacy, perception of media coverage, knowledge about COVID-19, perceived worries, COVID-19 symptoms, and COVID-19 adherence behavior. Additionally, sociodemographic characteristics, life satisfaction, and health problems were assessed. The original English version was translated by professional translators into German and Italian and programmed in the Qualtrics survey tool. The online survey was pre-tested by five young people in each of the three languages.

2.3. Data collection

On November 10, 2020, the people selected by the FSO ($n = 3597$) were sent an invitation letter by post informing them of the study and inviting them to take part. In the letter, participants received a link and QR code for the online survey and an individual study code that they had to enter to start the survey. On November 28, the invitees, who had not

taken part in the survey ($n = 3021$) received a reminder letter. A second reminder letter to non-responders was sent on December 15 ($n = 2725$). It included the survey link and a short 15-item version of the survey on paper. The long and short survey continued till January 5, 2021. The analysis for this paper covers only the long survey, as the short survey did not include political ideology.

2.4. Ethics

The study was conducted in line with the Swiss Human Research Act. As the study did not include personal health data and the collected data were anonymized for the analysis, the ethics committee of Zurich judged the study as being exempt from full ethics review (number Req-2020-01081). The participants received a study information letter together with the study invitation regarding the aims of the study and the confidentiality of the data. All participants provided informed consent at the beginning of the survey. Data were pseudo-anonymized, and the individual study code and the addresses from the FSO were kept in separate secure folders with restricted access.

2.5. Dependent variable: adherence score

Preventive behavior was assessed in the survey by asking participants to what extent they adhered to the recommended protective measures. The scale ranges from 1 „Never” to 4 „Always”. The respective recommended measures were listed for four phases of the pandemic (pre-lockdown: January–early March 2020, lockdown: March–May 2020, summer: June–August 2020, and now, i.e. to the timepoint of the study). In total, participants rated 17 protective measures. Two protective measures were excluded from the calculation of the adherence score due to a high number of missing values (“Quarantine when coming back from places at high risk of Covid-19” and “Use the SwissCovid app”). The values for the remaining 15 measures were summed and divided by the number of non-missing measures.

2.6. Independent variables

2.6.1. Political ideology

Political ideology was measured with an adapted scale from the standard Eurobarometer study (Klingemann, 1997): “In political matters, people talk of ‘the left’ and ‘the right.’ How would you place your views on this scale?” Klingemann (1997) reported that answers to this question show a unimodal distribution—with most respondents in the middle categories and diminishing frequencies toward the extremes of the scale. Following the evidence that an 11-point scale with a middle point performs better than a 10-point scale without a middle point (Kroh, 2007; Zuell and Scholz, 2016), we adapted the original scale and added a middle point (11-point scale; 0 = left, 5 = center, 10 = right). Based on the adapted political ideology scale, a political extremism score was created, calculating the distance to the midpoint of the left-right scale for every participant, yielding a score from 0 (no distance to midpoint, no extremism) to 5 (highest distance to midpoint, high extremism) (Stier et al., 2020).

2.6.2. Information sources

Participants were asked about the information sources they primarily used to inform themselves about the COVID-19 pandemic, using a question from a COVID-19 study conducted in the Netherlands, Germany, and Italy (Meier et al., 2020) and adapted to Swiss information sources. They could select 3 out of 10 listed sources and could optionally add other, non-mentioned sources. The information sources’ variables were analyzed in seven categories: “broadcast” (television or radio or both), “health-based” (“official health hotlines,” “official health websites,” and “healthcare professionals”), “news sources,” “social media sources,” “people I speak to on a daily basis,” “other websites,” and “not actively looking for information.”

2.6.3. Trust

Respondents were asked about their trust in different sources: 1) the federal government (Federal Council), 2) the cantonal government, 3) journalists, and 4) scientists. The items were rated with five response options from “no trust at all” to “a great deal.” For the analysis, the mean value was calculated from these four items ranging from 1 (low trust) to 5 (high trust).

2.6.4. Risk perception

Risk perception was measured with an item battery asking participants about their worries about the current pandemic situation. Participants were asked how worried they were about being infected and how worried they were about transmitting the virus to others. The five response options ranged from “not at all” to “extremely.” For the analysis, categories were combined into “low worry,” “middle worry,” and “high worry.”

2.7. Covariates

2.7.1. Sociodemographics

Participants entered an individual study code in the survey, allowing the research team to link survey data with sociodemographic data provided by the FSO: age of respondent on January 1, 2020, household size (ranging from 1 to 16), and canton of residence (Zurich, Thurgau, or Ticino). The variables on gender, employment, education, and origin (born and raised in Switzerland: yes or no) were taken from the online survey. For the analysis, a dummy variable was created for employment (combining part- and full-time employment vs. no employment) and three categories for the highest education (elementary school and middle school = low education; high school and vocational school = middle education; bachelor's, master's, and postgraduate = high education).

Additionally, the following three other variables from the survey were included as covariates to adjust for possible confounding effects. We expected these variables to influence our dependent as well as independent variables. Health literacy has been linked to both adherence (Silva and Santos, 2021) and trust (De Gani et al., 2022). We expected COVID-19 infections among family members or friends to influence both young people's adherence to preventive behavior (Elhadi et al., 2020) and their risk perception. Finally, peer-group pressure may affect political extremism on the one hand and adherence to preventive behavior (Andrews et al., 2020) on the other hand.

2.7.2. Health literacy

Health literacy was assessed with the five items of the appraisal subscale of the coronavirus-related health literacy measure (HLS-COVID-Q22) developed by Okan et al. (2020), with a five-point scale ranging from 1 (very difficult) to 5 (very easy). The five items were summed up to a score ranging from 5 (low health literacy) to 25 (high health literacy).

2.7.3. Family/friends infected with Covid-19

Respondents were asked if persons around them (family/friends) were infected with COVID-19 (yes/no).

2.7.4. Pressure to adhere/not to adhere

For all of the above-mentioned preventive measures (see section 2.5), whether participants felt social pressure to comply or not was assessed. The scale ranged from “heavy pressure to not comply” to “heavy pressure to comply.” The 15 pressure items were summed up and divided by the number of non-missing pressure items, yielding the mean value.

2.8. Statistical analysis

The main study variables were explored using descriptive analysis. To assess Hypothesis 1, we ran logistic regressions with each of the

information sources as the dependent variable and political ideology and political extremism as independent variables, adjusted for age and gender. Missing values were checked with Little's missing completely at random (MCAR) test (Li, 2013).

Hypotheses 2–4 were tested with multivariate regression analyses. For Hypothesis 2 (assessing the association between political extremism and the adherence score), a stepwise procedure was applied. Model 1 included political extremism, information sources, trust, and risk perception. In the next step, covariates (sociodemographic variables, family members tested positively, health literacy, and perceived pressure to adhere) were added (Model 2). For the final models examining hypotheses 3 and 4 (Models 3 and 4), the interaction terms of political extremism with trust and risk perception were added. For all analyses, we used a p value of >0.05 as the threshold of significance, and for the multivariate regression, robust standard errors were applied to avoid bias due to heteroskedasticity. Analyses were performed using Stata 17 (StataCorp, 2017).

3. Results

3.1. Missing data

Nine variables contained missing data. Forty participants did not provide an answer to the political ideology item and 41 to the adherence score. Little's MCAR test for the dependent and independent variables and the test for covariate-dependent missingness indicate that data are missing completely at random. Therefore, the listwise deletion of missing data was applied.

3.2. Sociodemographics

In the online survey, a total of 1043 participants took part. Of them, 128 participants were excluded for the following reasons: missing study code and/or completely missing data (n = 121) and missing sociodemographics (n = 7). The remaining 915 participants corresponded to a response rate of 26%. For this specific analysis, respondents with missing key questions on information sources used were excluded (n = 22), resulting in an analytical sample of 893 participants.

Among participants, 52% were females, 50.5% were with middle education, 75.1% were employed full-time or part-time, and 81.9% were born and raised in Switzerland (Table 1). The mean age of the

Table 1
Characteristics of study participants.

| Parameters | Total <N = 893 |
|--|----------------|
| Gender, n (%) | |
| Male | 423 (47.3) |
| Female | 464 (52.0) |
| Other/preferred not to answer | 6 (0.7) |
| Age, mean (SD) | 22.8 (5.8) |
| Education, n (%) | |
| Low education | 157 (17.6) |
| Middle education | 451 (50.5) |
| High education | 284 (31.8) |
| Missing | 1 (0.1) |
| Employment, n (%) | |
| Full-time or part-time | 671 (75.1) |
| No employment | 222 (24.9) |
| Household size, mean (SD) | 3.4 (1.3) |
| Born and raised in Switzerland, n (%) | |
| No | 162 (18.1) |
| Yes | 731 (81.9) |
| Canton, n (%) | |
| German-speaking (Zurich and Thurgau) | 381 (42.7) |
| Italian-speaking (Ticino) | 512 (57.3) |
| Family/friends infected with COVID-19, n (%) | |
| No | 359 (40.2) |
| Yes | 500 (56.0) |
| Missing | 34 (3.8) |

participants was 22.8 years (SD: 5.8), with 30% in the age group of 15–19, 33.7% in the age group of 20–25 years, and 36.3% belonged to the age group of 26–34 years. The mean household size was 3.4 persons (SD: 1.3). In addition, at the point of the selection for the study, 57.3% of the participants were residents of the Canton of Ticino, 22.2% of the Canton of Zurich, and 20.5% of the Canton Thurgau.

3.3. Political ideology and political extremism

The mean value on the ideology scale was 4.59 (SD 2.14), and on the political extremism scale it was 1.64 (SD 1.43). As shown in Fig. 1, of all participants answering this item, 248 (29%) placed themselves in the middle of the left-right ideology scale and, thus, showed no political extremism; 42.8% indicated a low political extremism with a distance of 1 or 2 points to the midpoint of the ideology scale; and over a quarter of the participants showed high political extremism: 17.9% (153 persons) with a distance of 3 points, 5.7% (49 persons) with a distance of 4 points, and 4.5% (38 persons) with a distance of 5 points.

3.4. Adherence to preventive behavior

The data regarding the number of young people who followed the recommended measures in the four phases of pre-lockdown, lockdown, summer, and in the current situation are shown in Table 2. Regarding adherence to measures, the majority of young people followed them most of the time or always. The lowest adherence (55.3%) was reported to social distancing in summertime, and the highest (92.6%) was reported to wearing a mask in public transport and public places in the current situation. The calculated adherence score over all time points, ranging from 1 to 4, yielded a mean value of 3.2 (SD: 0.48) and a median of 3.4.

3.5. Information sources

Table 3 shows the three information sources that respondents used most often to inform themselves about COVID-19. The most often used sources were health-based sources (61.3%), broadcast sources (59.5%), and news sources (newspapers and online news, 52.9%). Personal contacts were used by almost a third (31.5%) of respondents as an information source, and around a fifth (21.3%) used social media. Not frequently used sources were other websites (12%) and 3.5% responded that they did not actively look for information. Participants further specified the news and social media sources they used (see Supplement 2).

3.6. Information sources and political ideology/extremism

Significant logistic regressions adjusted for age and gender indicate

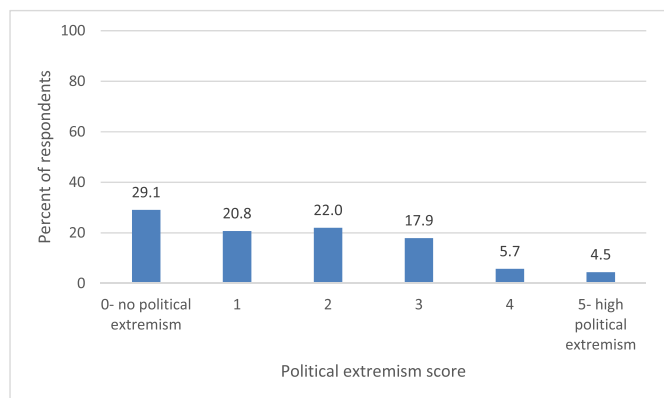


Fig. 1. Frequency of political extremism score.

Table 2

Adherence to preventive behavior always or most of the time.

| Preventive behaviors | n (%) of measures followed always or most of the time | n (%) missing |
|--|---|---------------|
| <i>Pre-lockdown (January–early March 2020)</i> | | |
| Hygiene measures | 631 (70.7) | 41 (4.6) |
| <i>Lockdown (March–May 2020)</i> | | |
| Hygiene measures | 805 (90.1) | 41 (4.6) |
| Social distance measures | 686 (76.8) | 41 (4.6) |
| Wearing mask when distance is not possible | 630 (70.6) | 41 (4.6) |
| Staying at home | 683 (76.5) | 42 (4.7) |
| Respecting ban on gatherings >5 people | 742 (83.1) | 42 (4.7) |
| <i>Summertime (June–August 2020)</i> | | |
| Hygiene measures | 686 (74.8) | 46 (5.2) |
| Social distance measures | 494 (55.3) | 47 (5.3) |
| Wearing mask in public transport | 720 (80.6) | 68 (7.6) |
| Wearing mask when distance is not possible | 553 (61.9) | 45 (5.0) |
| <i>Now (November 2020–January 2021)</i> | | |
| Hygiene measures | 808 (90.5) | 47 (5.3) |
| Social distance measures | 735 (82.3) | 48 (4.5) |
| Wearing mask when distance is not possible | 768 (86.0) | 51 (5.7) |
| Wearing mask in public transport and public places | 827 (92.6) | 48 (5.4) |
| Respecting ban on gatherings >10 people | 762 (85.3) | 62 (6.9) |

that the odds of using health-based sources, news sources, and other sources decrease for every unit of the political ideology scale, i.e., when moving to the right pole of the scale (see Table 3). The odds for using health-based sources were 0.90 (CI: 0.84–0.97), for news sources 0.93 (CI 0.87–0.997), and for other websites 0.83 (CI: 0.75–0.92). In contrast, the odds of using broadcasting sources increased when moving to the right pole of the ideology scale (OR: 1.08, CI 1.01–1.15). The same analysis was done with political extremism. The odds of using social media decreased with higher political extremism (OR 0.88, CI 0.78–0.99). Further analyses on social media adjusted for age and gender show that the odds of using Instagram decrease when moving to the right pole of the ideology scale (OR 0.79, CI 0.64–0.97), while for Facebook, there is a tendency of increased odds of using it when moving to the right pole of the ideology scale (OR 1.19, CI 0.98–1.45). These results support Hypothesis 1. Political ideology and—to a lesser extent—political extremism are associated with information-seeking behavior about COVID-19 for some of the indicated sources of the young people.

3.7. Political extremism predicting preventive behavior

The association between political extremism and adherence to preventive behavior was not significant in Model 1 ($p = 0.067$) (see Table 4), whereas the other independent variables trust ($p = <0.001$), worry about infection with COVID-19 (middle worry: $p = 0.001$, high worry: $p = <0.001$), and worry about transmitting COVID-19 (middle worry: $p = 0.018$, high worry: $p = <0.001$) were all highly significant. Higher trust, middle, or high worry about getting infected or transmitting the virus were associated with higher adherence to preventive measures. From the information sources, social media use was negatively associated with adherence behavior ($p = 0.005$). In Model 2, the additional covariates, health literacy ($p = 0.006$) and perceived pressure for or against adherence ($p = <0.001$) were significant, but not family/friends tested positive for COVID-19 ($p = 0.387$). Higher perceived pressure to adhere to measures and higher health literacy were associated with higher adherence to preventive measures. In both models, residence in the Canton Ticino, a higher age, and female gender were associated with an increase in the adherence score. In contrast, being born and raised in Switzerland was associated with a decrease in the

Table 3
Information sources used by political ideology and political extremism.

| Information sources | Political ideology | | Political extremism | | N (%) |
|--------------------------------------|--------------------|-------------------------------|---------------------|-------------------------------|------------|
| | mean (SD) | OR [95% CI] ¹ | mean (SD) | OR [95% CI] ^a | |
| Health-based sources | | 0.90 [0.84–0.97]** | | 1.06 [0.95–1.17] | |
| No | 4.88 (0.12) | | 1.57 (0.08) | | 346 (38.8) |
| Yes | 4.42 (0.09) | | 1.68 (0.06) | | 547 (61.3) |
| Broadcasting sources | | 1.08 [1.01–1.15]* | | 0.96 [0.87–1.06] | |
| No | 4.45 (0.12) | | 1.68 (0.08) | | 362 (40.5) |
| Yes | 4.68 (0.10) | | 1.61 (0.06) | | 531 (59.5) |
| News sources | | 0.93 [0.87–0.99]* | | 1.08 [0.98–1.19] | |
| No | 4.73 (0.11) | | 1.56 (0.07) | | 421 (47.1) |
| Yes | 4.47 (0.10) | | 1.71 (0.07) | | 472 (52.9) |
| People I speak to on a daily basis | | 0.99 [0.92–1.06] | | 0.91 [0.82–1.01] [†] | |
| No | 4.60 (0.10) | | 1.69 (0.06) | | 612 (68.5) |
| Yes | 4.51 (0.13) | | 1.53 (0.09) | | 281 (31.5) |
| Social media sources | | 1.07 [0.99–1.16] [†] | | 0.88 [0.78–0.99]* | |
| No | 4.53 (0.08) | | 1.69 (0.06) | | 703 (78.2) |
| Yes | 4.81 (0.15) | | 1.46 (0.11) | | 190 (21.3) |
| Other websites | | 0.83 [0.75–0.92]*** | | 1.15 [0.99–1.33] [†] | |
| No | 4.63 (0.09) | | 1.61 (0.05) | | 789 (88.0) |
| Yes | 4.10 (0.21) | | 1.87 (0.14) | | 88 (12.0) |
| Not actively looking for information | | 1.21 [1.0–1.46] [†] | | 1.02 [0.77–1.34] | |
| No | 4.56 (0.07) | | 1.63 (0.05) | | 896 (96.5) |
| Yes | 5.50 (0.44) | | 1.65 (0.31) | | 31 (3.5) |

Note. OR = odds ratio, CI = confidence interval. ***p < 0.001, **p < 0.01, *p < 0.05, [†]p < 0.1. ^a Logistic regression adjusted for age and gender using robust standard errors.

score. No significant association was seen between employment, education, and household size and the score.

In regression models 3 and 4, the interaction terms (political extremism/worry of getting infected and political extremism/trust) were added (see Table 5). The interaction term political extremism/worry of getting infected was not significant (middle worry: p = 0.882 and high worry: p = 0.156), while the interaction term political extremism/trust was significant (p = 0.047) as well as the main effect of political extremism (p = 0.041). The interaction is displayed in Fig. 2. The respondents with no political extremism showed constant predicted adherence values for different levels of trust. In contrast, respondents with an extremism of 3 or 5 had lower predicted adherence values when they perceived low trust and higher adherence levels when they perceived high trust. This is most pronounced for persons with a political extremism of 5. In Model 4, the use of social media turned significant (p = 0.034): social media users' adherence score was lower compared to non-users' score (B: -0.05).

Table 4
Models with political extremism to predict preventive behavior—multivariate regression.

| Variables | Model 1 | | Model 2 | |
|---|---------------------|------------------|---------------------|------------------|
| | B | 95% CI | B | 95% CI |
| Political extremism | -0.021 [†] | [-0.04–0.00] | -0.013 | [-0.03–0.00] |
| Broadcasting sources [ref.no] | -0.008 | [-0.08–0.07] | 0.013 | [-0.06–0.08] |
| News sources [ref. no] | -0.015 | [-0.08–0.05] | -0.009 | [-0.07–0.06] |
| Health-based sources [ref.no] | 0.038 | [-0.04–0.12] | 0.023 | [-0.05–0.10] |
| Social media sources [ref.no] | -0.125** | [-0.21 to -0.04] | -0.081 [†] | [-0.17–0.00] |
| Other websites [ref. no] | -0.019 | [-0.13–0.09] | -0.022 | [-0.13–0.08] |
| People I speak to on a daily basis [ref.no] | -0.075 [†] | [-0.15–0.00] | -0.034 | [-0.11–0.04] |
| Not actively looking for information [ref.no] | -0.145 | [-0.49–0.20] | -0.107 | [-0.42–0.20] |
| Trust | 0.098*** | [0.05–0.15] | 0.101*** | [0.05–0.15] |
| Worry getting infection | | | | |
| Middle worry | 0.110** | [0.04–0.18] | 0.083* | [0.02–0.15] |
| High worry | 0.247*** | [0.17–0.33] | 0.196*** | [0.12–0.28] |
| Worry transmitting virus | | | | |
| Middle worry | 0.125* | [0.02–0.23] | 0.121* | [0.02–0.22] |
| High worry | 0.209*** | [0.11–0.31] | 0.179*** | [0.09–0.27] |
| Canton [ref. German-speaking] | | | 0.171*** | [0.11–0.24] |
| Age | | | 0.015*** | [0.01–0.02] |
| Gender [ref. male] | | | 0.113*** | [0.05–0.18] |
| Employment [ref. no] | | | 0.037 | [-0.03–0.11] |
| Education [ref. low education] | | | | |
| Middle education | - | | -0.057 | [-0.15–0.04] |
| High education | | | -0.026 | [-0.14–0.09] |
| Household size | | | 0.004 | [-0.02–0.03] |
| Born and raised in Switzerland [ref. no] | | | -0.135** | [-0.22 to -0.05] |
| Pressure to adhere/not to adhere | | | 0.085*** | [0.04–0.13] |
| Family/friends tested positive [ref.no] | | | 0.022 | [-0.04–0.08] |
| Health literacy constant | 2.861 | [2.63–3.09] | 1.894 | [1.48–2.31] |
| N | 813 | | 806 | |
| R ² | 0.18 | | 0.29 | |
| Effect size Cohen's f ² | 0.20 | | 0.41 | |

Note. CI = Confidence interval. Unstandardized coefficients and robust standard errors were used.

***p < 0.001, **p < 0.01, *p < 0.05, [†]p < 0.1.

In line with Hypothesis 4, political extremism interacted with trust to impact adherence behavior. Hypothesis 3, which postulated an interaction of political extremism with worry about getting infected to predict adherence, could not be supported.

4. Discussion

This paper adds evidence on how young people in the German-speaking and Italian-speaking parts of Switzerland inform themselves about COVID-19, and what role political extremism, use of information sources, trust, and risk perception play in adhering to preventive measures.

A majority of young people placed themselves at the center of the ideology scale or 1–2 points aside. Compared to the data of the European Social Survey for Switzerland for adults (4.87, SD 1.87) (Thorisdottir et al., 2007), this study sample yielded a lower mean, indicating more placements toward the left pole. This is consistent with the tendency of younger people's political attitudes to be more extreme and stabilize

Table 5
Models with political extremism to predict preventive behavior—multivariate regression with interaction terms.

| Variables | Model 3 | | Model 4 | |
|---|---------------------|------------------|----------|------------------|
| | B | 95% CI | B | 95% CI |
| Political extremism | -0.009 | [-0.04- 0.02] | -0.124* | [-0.24-0.01] |
| Broadcasting sources [ref:no] | 0.009 | [-0.06-0.08] | 0.011 | [-0.06-0.08] |
| News sources [ref: no] | -0.011 | [-0.08-0.054] | -0.017 | [-0.08-0.05] |
| Health-based sources [ref:no] | 0.022 | [-0.06-0.10] | 0.017 | [-0.06-0.09] |
| Social media sources [ref:no] | -0.086 [†] | [-0.17-0.00] | -0.087* | [-0.17 to -0.00] |
| Other websites [ref: no] | -0.022 | [-0.13-0.08] | -0.028 | [-0.13-0.08] |
| People I speak to on a daily basis [ref: no] | -0.034 | [-0.11-0.04] | -0.044 | [-0.12-0.03] |
| Not actively looking for information [ref:no] | -0.109 | [-0.42-0.20] | -0.114 | [-0.42-0.19] |
| Trust | 0.102*** | [0.05-0.15] | 0.043 | [-0.03-0.12] |
| Worry getting infection | | | | |
| Middle worry | 0.086 [†] | [-0.01-0.18] | 0.081* | [0.02-0.15] |
| High worry | 0.228*** | [0.11-0.34] | 0.198*** | [0.12-0.28] |
| Worry transmitting virus | | | | |
| Middle worry | 0.117* | [0.02-0.22] | 0.107* | [0.01-0.21] |
| High worry | 0.174*** | [0.08-0.27] | 0.169*** | [0.08-0.26] |
| Canton [ref: German-speaking] | 0.176*** | [0.12-0.24] | 0.178*** | [0.12-0.24] |
| Age | 0.015*** | [0.01-0.02] | 0.015*** | [0.01-0.02] |
| Gender [ref. male] | 0.113*** | [0.05-0.18] | 0.110*** | [0.05-0.17] |
| Employment [ref: no] | 0.039 | [-0.03-0.11] | 0.040 | [-0.03-0.11] |
| Education [ref: low education] | | | | |
| Middle education | -0.057 | [-0.15-0.04] | -0.066 | [-0.16-0.03] |
| High education | -0.027 | [-0.14-0.09] | -0.032 | [-0.14-0.08] |
| Household size | 0.004 | [-0.02-0.03] | 0.004 | [-0.02-0.03] |
| Born and raised in Switzerland [ref. no] | -0.135** | [-0.22 to -0.05] | -0.134** | [-0.21-0.05] |
| Pressure to adhere/not to adhere | 0.085*** | [0.04-0.13] | 0.089*** | [0.05-0.13] |
| Family/friends tested positive [ref:no] | | | | |
| Health literacy | 0.012** | [0.00-0.02] | 0.012** | [0.00-0.02] |
| Political extremism#Trust | | | 0.035* | [0.00-0.07] |
| Political extremism#Worry getting infection | | | | |
| Middle worry | -0.002 | [-0.05-0.05] | | |
| High worry | -0.019 | [-0.07-0.03] | | |
| constant | 1.916 | [1.51-2.32] | 2.110 | [1.68-2.54] |
| N | 808 | | 808 | |
| R ² | 0.29 | | 0.30 | |
| Effect size Cohen's f ² | 0.41 | | 0.43 | |

Note. CI = Confidence interval. Unstandardized coefficients and robust standard errors were used.

***p < 0.001, **p < 0.01, *p < 0.05, [†]p < 0.1.

with increasing age (Rekker et al., 2015; Watts, 1996). Further, it mirrors the voting behavior of young people in Switzerland. In the recent Swiss federal elections in 2019, young people favored environment-friendly parties, such as the Greens and the Social Democrats at the left pole and the centrist Green Liberals. Compared to the other age groups, young people voted less for the right-wing Swiss People's Party and the Liberals (Bernhard, 2020).

Most young people adhered to the preventive measures to a high degree—except for social distancing. This is in line with results found in a sample of students at the Zurich University of Applied Sciences (Zysset et al., 2021) and in a cohort study in Zurich with young people aged 22 years (Nivette et al., 2020). Various hypotheses were tested relating to political ideology and extremism and their association with a number of

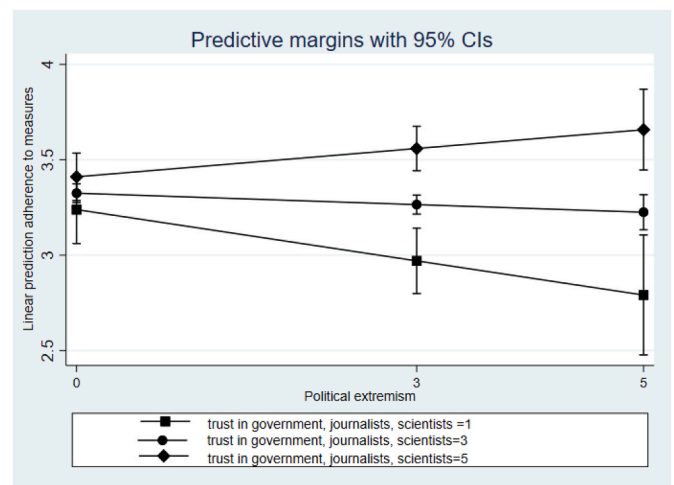


Fig. 2. Interaction of political extremism and trust to predict preventive behavior.

protective behaviors and containment measures.

With regard to information behavior, Hypothesis 1 political ideology was associated with the use of health-based sources, broadcasting sources, news sources, and other websites, while for political extremism, there was only a negative association with social media use: the higher the extremism, the less use of social media (Hypothesis 1). In our sample, political extremism was not associated with adherence to preventive measures, as postulated in our Hypothesis 2. However, in support of Hypothesis 4, political extremism was associated when the interaction between political extremism and trust in the government, scientists, and journalists was considered. This finding is in line with the findings of Koetke et al. (2021), who observed that higher levels of trust in science influenced social distancing intentions differently for conservatives and liberals. This is also supported by Ruisch et al. (2021), who argue that ideological differences in the U.S. are mainly rooted in trust in science and trust in Donald Trump. In contrast, in another U.S. study, trust was found to be a mediator between political ideology and risk perception (Shao and Hao, 2020). For Switzerland, the result is plausible in light of Nachtwey et al.'s (2020) preliminary conclusion of an empirical investigation of protests against COVID-19 measures in Switzerland and Germany stating that the movement is rooted in a deep mistrust of democratic institutions, such as politics, parties, science, and media. We found no interaction between political extremism and worry about getting infected regarding adherence, as postulated in Hypothesis 3. Thus, surprisingly, risk perception did not moderate the association between political extremism and adherence, as reported in other studies (Barrios and Hochberg, 2020; Shao and Hao, 2020). Future analyses may want to focus more on the mediating role of risk perception in detail.

In light of the “infodemic,” we further investigated the relevance of information sources on adherence. The use of specific information sources was not associated with adherence to preventive behavior, except for social media in the model not adjusted for the covariates. The model including the interaction term between trust and political extremism, yielded a lower adherence as well in social media users. This result is in contrast to other findings suggesting a supportive role of social media in adherence via increased risk perception of social media users (Oh et al., 2020). The most obvious explanation is misinformation spread on social media (Gabarron et al., 2021), which can hamper adherence to preventive measures (Roozenbeek et al., 2020). In addition, on a more subtle level, the characteristics of social media impair the quality of information: low-quality news content on social media has been associated with more user engagement than high-quality news (Hauptli et al., 2020). Another aspect is that social media may restrict

traditional elites from communicating policy measures. The debate on face masks on Twitter in Switzerland was found to be driven by individual politicians and the public, whereas parties and newspapers picked up Twitter debates (Gilardi et al., 2021). Non-expert voices on social media that emerged after the crisis phase of the pandemic decreased the public's trust in institutions (van Dijck and Alinejad, 2020). It seems plausible that the lower adherence of social media users was most pronounced when the interaction of political extremism and trust was considered. Problematic information on social media may have the greatest impact on people with low trust in institutions (Roozenbeek et al., 2020) and extreme political positions.

Among the covariates, we included some of the sociodemographic variables that were highly associated with adherence to preventive behaviors, including age, canton of residence, and being a native Swiss. In other studies, similar associations were found; for example, (young) women were more likely to adhere to preventive behaviors (Brouard et al., 2020; Nivette et al., 2020; Zysset et al., 2021), and higher adherence was also positively associated with age (Berg-Beckhoff et al., 2021; Brouard et al., 2020). With respect to the language regions, residents of Italian-speaking Ticino were more likely to follow the measures than residents of German-speaking Zurich or Thurgau. This may be explained by the higher number of cases in the Canton Ticino during the first wave of the pandemic, resulting in a long-lasting impression. People born and raised in Switzerland were less likely to follow the measures compared than those not native to Switzerland, a finding also reported by Nivette et al. (2020). From the other covariates, health literacy was associated with increased adherence. This is of importance for the context of the "infodemic," since enhancing critical health literacy in the population has been viewed as crucial for being able to identify reliable information and critically assess them (Abel and McQueen, 2020; Okan et al., 2020). The pressure to adhere or not to adhere was also a significant covariate confirming a substantial effect of subjective norms on health behavior, as postulated by the theory of planned behavior (Ajzen, 1991). We found no influence from family or friends infected with COVID-19.

There are some limitations to consider in this study. First, although the political ideology scale is widely used to explain voting behavior and party identification, research has shown that people associate rather different meanings to the concepts of "left" and "right" (Bauer et al., 2017; Zuell and Scholz, 2016). This impairs intraindividual and especially cross-cultural comparability. Another limitation is that the extent of adhering to preventive measures may have been subject to social desirability, since not adhering to preventive measures was socially and legally not opportune. While the survey was conducted anonymously, the study code assigned to every participant may have been considered suspicious by some young people. Furthermore, the results must be considered with caution with respect to other response biases due to the self-report nature of our data. Due to the multiple testing of our data, the detection of statistically significant differences is more likely. With respect to causality, we do not know which mechanisms are behind the associations we found. We cannot exclude a selection bias with the higher participation of more adherent or less politically extreme persons. Thus, generalizability is limited.

5. Conclusion

Political ideology is associated with young people's use of information sources about COVID-19 and may, therefore, represent an orientation point in their navigation through the "infodemic" and pandemic. Public authorities need to consider the information sources of different political groups and use diverse channels for official COVID-19 communication. Political extremism is also related to lower adherence to preventive measures in young people with low trust in the government, scientists, and journalists. More research is required on the needs and characteristics of this specific group to be better prepared for future crisis situations. The involvement of respective communities in crisis

planning may be a first trust-building measure.

Credit statement

Sibylle Juvalta: Data curation, Validation, Formal analysis, Writing – original draft, Writing – review & editing. Camilla Speranza: Data curation, Writing – review & editing. Dominik Robin: Conceptualization, Writing – review & editing. Yassmeen Elmaohub: Data curation, Writing – review & editing. Philipp Dreesen: Funding acquisition, Conceptualization, Methodology, Supervision, Project administration, Writing – review & editing. Julia Dratva: Funding acquisition, Conceptualization, Methodology, Formal analysis, Writing – review & editing. Suzanne Suggs: Funding acquisition, Conceptualization, Methodology, Writing – review & editing.

Data availability

The data and the code used for this publication are available at <https://doi.org/10.5281/zenodo.5801890>.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2022.115596>.

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