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Diversity and credibility in young people's news feeds: A foundation for teaching and learning citizenship in a digital era

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- Citizen science approach to map young people's digital news feeds.
- Students predominately read hard news.
- Digital news comes primarily from established news media sites deemed credible by students.
- On social media, students mostly share news they find credible.
- Students' authentic news feeds as potentials and challenges in education and democracy.

Purpose: The credibility of digital news is presently a topic of debate, and curricula underline the importance of media literacy. However, the content and credibility of young people's news feeds have not been investigated in detail in any large-scale studies. Here we explore the nature of news featured in Swedish upper secondary school students' news feeds, how news is shared, and how credible the news is according to the students.
Approach: Using citizen science and a mixed methods approach we review 2617 news from authentic news feeds.
Findings: The students' news feeds primarily contain hard news from established news media. News is predominately found on news domains, not through social media. Soft news is less common and is perceived as less credible. Boys find more sports while girls identify more entertainment and lifestyle news. The news feeds also contain some highly biased political information.
Research limitations: The study was carried out in Sweden, and further international research on authentic news feeds is needed to view results in relation to society and educational practices.
Research and practical implications: In education, students' news feeds can be used to scrutinize credibility and help students navigate towards credible news domains to support democratic engagement.

Keywords: digital news literacy; credibility; democracy; student; citizen science

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1 Introduction

The evolution of digital media has had a considerable impact on how news is produced, shared and consumed. This is especially true for young people, who to a large extent find and share news online. Today, online news media is pivotal to stimulate conversations and active citizenry (Ekström, Olsson & Shehata, 2014; Lee, Shah & McLeod, 2013). However, new media can in many ways be described as a double edged sword; it may support democratic agency but may also pose a threat through the spread of misinformation in disconnected digital communities (Howell, 2013; Pajnik & Downing, 2008); it may support flow of information and connect people across cultural and ideological borders, but foster mistrust through speculations, rumors, and lies (Bessi et al. 2015; Soroush, Roy & Aral, 2018). Many organizations and individuals are using new media to discuss and support human rights, environmental issues and other societal matters in a balanced manner. At the same time, other actors take advantage of these channels to spread fear and prejudices through biased and faked news. On a larger scale such actors may be regimes attempting to destabilize foreign societies, political movements smearing opponents, or religious extremists recruiting members (Bjola & Pamment, 2016; Farwell, 2014; Howell, 2013; Woolley & Howard, 2017). Online forums can provide an undisturbed setting for opponents of a democratic, multicultural and egalitarian society, promoting further radicalization (Wojcieszak, 2010). News on social media may support democratic efforts in the Middle East but also fuel conflicts (Howell, 2013). Scientific findings can be shared globally in an instant, but the same goes for lies and rumors made up to generate clicks for profit (Del Vicario et al. 2016; Mosesson, 2017). In sum, citizens need the ability to identify potentials and pitfalls in new media to safely navigate the flood of information.

Today national and international guidelines emphasize the importance of education preparing students to navigate information in critical and constructive ways (EU, 2015; UNESCO, 2017; Skolverket, 2017). But to design constructive teaching and learning practices we firstly need to map out the digital landscape of news that the adolescents are facing. To understand the magnitude of the challenge, the news feeds of adolescents need to be studied in detail and at a large scale. Only then will we have a solid base upon which to build teaching initiatives and materials to guide young citizens.

The purpose of this study is to investigate what, how, and where, more and less credible information is spread among young people. We will address the following questions:

(1) What news flow in young peoples' news feeds?
(2) How is it shared?
(3) How credible is the information according to young people?
(4) How can such an evaluation of news be used in education to support democratic engagement in a digital era?

Our findings are based on the analyses of actual news feeds of 2644 upper secondary school students, age 16-19. We discuss how the results can relate to education and democratic challenges in a world saturated by digital media. Acknowledging the importance of media literacy, we focus this study on the question of access to and evaluation of information (Livingstone, 2004) to better understand what young people today face in their news feeds. This means that we will not address other aspects of what has been labeled digital competence, such as skills needed to analyze and create digital information (Livingstone, 2004; Hatlevik, Guðmundsdóttir & Loi, 2015; Skolverket, 2017).

1.1 News and citizenry in a digital world

Research and reports on news in digital media suggest that traditional news aggregators such as newspapers (in particular evening papers) still have a strong position in the Swedish media landscape (Statens Medieråd, 2015; Wadbring & Ödmark, 2014). But differences between age groups are large, young people mainly use digital media to access news (Statens Medieråd 2018) and they also use social media to access news more than other groups (Statens Medieråd, 2015; Davidsson & Thoresson, 2017). News may not be the most common type of information in Swedish youths digital communications, but between 70-80% report that they access news regularly (Statens Medieråd 2018). Some previous small scale research also indicates that young Swedes may not be aware of how much news they actually consume – and may fail to self-report their news habits. When participants in a previous study reported to not have a news reading strategy more than half of them had apps and push notifications from news sites personally installed on their phones (Jervelycke Belfrage, 2016). The importance of reading and sharing news has been noted as pivotal for civic awareness and democratic engagement, especially among young since this may be a starting point for active citizenry (Boulianne, 2016; Kruikemeier & Shehata, 2017; Shehata, Ekström & Olsson, 2015). What happens online is connected to citizenship and political engagement in various ways (Kim, Russo & Amnå, 2016; Kruikemeier & Shehata, 2017).

The young generation has been described as "the networked young citizen" (Loader, Vromer & Xenos, 2014) with potential orientations towards engagement in a participatory culture but also a risk of turning their backs on mainstream politics and citizenry based upon duty. For "networked young citizens" in Sweden news consumption has been noted as central for their public engagement – and vice versa (Ekström, Olsson & Shehata, 2014; Kruikemeier & Shehata, 2017). And mobilization of political interest rather than media malaise seems to be the effect on young people reading news in Sweden (Kruikemeier & Shehata, 2017). Thus, engagement with news plays a pivotal part of democracy, not least among a generation of future active citizens and decision makers.

1.2 Digital news, echo-chambers and filter bubbles

Usually the most shared news is very simplistic and striking (Wadbring & Ödmark, 2014). In online environments news that is close in time and space seems to be shared more than news from other countries and cultures (Wadbring & Ödmark, 2014). International research has shown that new media and modern journalism in different ways can facilitate the spread of exaggerations and lies. This implies new requirements for both readers and society (Silverman, 2015; Wineburg & McGrew, 2019). Today mainstream and non-mainstream news are mixed and shared in social media, making it difficult to assess credibility (Fletcher & Park, 2017). Finding nuanced information may be further complicated by hidden algorithms and seductive presentations of information in social media and search engines (Gillespie, Boczkowski & Foot, 2014). Technology is never neutral in that it always promotes some behaviors and suppresses other (Verbeek, 2005). Social media may, for instance, support social connections between friends of similar backgrounds and opinions, but suppress more diverse communications, creating so called "echo chambers" (Sunstein, 2007). Search engines, social media and news aggregators may also support "filter bubbles" as algorithms are coded to personalize and make it "easy" for us to find what we are looking for based upon our previous online presence and behavior (Pariser, 2011).

Problems with echo-chambers have been confirmed in empirical research on freely available data from US Facebook users (Bessi et al. 2015; Del Vicario et al. 2016; Schmidt et al., 2017). The results show how misinformation and scientific information is spread in segregated networks where "users mostly tend to select and share content according to a specific narrative and to ignore the rest" (Del Vicario et al. 2016, p. 557). Teenagers, according to Danah Boyd (2014), seem to act in similar ways online.

Research funded by Facebook has also confirmed the problem with echo-chambers but this research, with Facebook authors, also found cross-cutting communication between users of different ideologies (Bakshy, Messing & Adamic, 2015). A study of Bing search engine users, with a Microsoft co-author, found empirical support for the existence of filter bubbles and echo-chambers, but also how opposing views may reach users in chambers and bubbles (Flaxman, Goel & Rao, 2016). They also suggest that news shared in social media can be more ideologically colored than news on news sites. It needs mentioning that the usefulness of industry-supported research on a questionable sample of users is of course limited (Hargittai, 2015; Sandvig, 2015).

Other research has suggested that news online may not be as problematic as advocates of "echo-chambers" and "filter bubbles" set forth. People's daily neighborhood conversations and offline news reading may be more ideologically segregated than online news habits (Gentzkow & Shapiro 2011). Some research, funded by Facebook, also suggests that users share true rumors and counter misinformation on Facebook (Friggeri et al. 2014). It has also been noted how social media can help individuals sort out relevant information and to navigate an abundance of news (Pentina, & Tarafdar, 2014). A contemporary paradox is that the abundance of news also makes it hard to find accurate and credible information.

Findings also indicate news habits much in line with offline news consumption with a lot of news being primarily descriptive (Flaxman, Goel & Rao, 2016; Gentzkow & Shapiro 2011). News was not a major feature on Facebook among the Bing users studied by Flaxman, Goel & Rao (2016); only one in 300 clicks on Facebook took the user to a news site. Instead individuals would primarily go directly to the news site of their choice (Flaxman, Goel & Rao, 2016). Established news media with similar and primarily descriptive news coverage has been seen to hold a strong position even in a world of echo-chambers (Budak, Goel & Rao, 2016). But young Swedes have been described as not very interested in quality news (Bennett, 2015; Sternvik, 2010).

1.3 News and education in a digital divide

Researchers and companies like Facebook, Twitter and Google have started new initiatives to prevent the spread of disinformation (Ciampaglia et al. 2015; Dong et al., 2015; Gupta et al., 2014). And software designed to counter filter bubbles are designed to provide democratic support (Bozdag & van den Hoven, 2015). But automated fact checking cannot today hinder the spread of biased and false information (Babakar & Moy, 2016, p. 3; Simonite, 2017). It takes active and informed citizens to safeguard balanced democratic conversations.

Studies of young people's online activities highlight the influence of socio-economic background on the use of digital media. Digital mastery and financially productive ways of using digital media seem to mirror societal inequalities related to for example gender and class (Boyd, 2014; Correa, 2010; Gui & Argentin, 2011; Hatlevik & Christophersen, 2013; Helsper, 2012; Hargittai, 2010; Scheerder, van Deursen & van Dijk, 2017). In the Netherlands, for instance, low education levels can be linked to time spent on online entertainment and low informational skills (van Deursen and van Dijk 2014). A similar divide has been noted in

Norway (Hatlevik & Christophersen, 2013; Hatlevik, Guðmundsdóttir & Loi, 2015). What Hargittai (2001) called "the second digital divide" between people with good and poor online skills may widen the "opportunity gap" (Putnam, 2015) between children with different socioeconomic status. In education it is therefore important to map out constructive ways for all to navigate a digital news world.

From an educational perspective it is central to study what content and contexts students need to understand and navigate to stay informed. From a pragmatic perspective we must connect teaching and learning to students' everyday lives and interests (Biesta & Lawy, 2006; Dewey, 2004; Englund, 2005). John Dewey (2004, p. 4) stated that humans "live in a community in virtue of the things which they have in common; and communication is the way in which they come to possess things in common." In line with this statement, teaching and learning in a democracy must support an understanding of our common community and support constructive dialogue. In classrooms, news may be used to promote knowledge, skills and attitudes in line with international and national guidelines. For instance, news may be used to stimulate knowledge on political, economic and social issues, to raise moral issues and discuss contemporary politics (Olsson, 2016).

Yet, a more detailed and empirically based understanding of the new media situation of adolescents is needed to design teaching and learning for current and future citizenry. For education it is also central to understand the world of students to meet their needs. Knowledge about what kind of information and perspectives students hold enables teachers to link learning to preconceptions in constructive ways.

Lee, Shah and McLeod (2013) emphasize the importance of encountering contrasting perspectives to develop opinions and an active citizenry. They find that their longitudinal study "confirms the contributions of deliberative activities in schools, democratic peer norms, news consumption, and citizen communication to the development of active citizens" (p. 686). From this perspective it is evident how news may stimulate conversations and support nuanced judgements, in school and society. Knowing how to access useful news information makes a fundamental part of active citizenry, empowering both individuals and society (Carlsson, 2014; Marchionini, 1999; Rheingold, 2012; Sundin & Carlsson, 2016).

Thus, it is important to improve our understanding of where students find credible news and also map out what media and sites that pose the greatest challenges. Starting in their digital news feeds, as we do in this study, can identify what, where and how useful and biased information is accessed and shared.

2 Methodological considerations

2.1 Citizen science in data collection

To explore what news flow in young peoples' news feeds, how it is shared and how credible it is, we needed to collect large amounts of quantitative and qualitative data on both content and *perceptions* of the content. A mixed methods approach provided us with a pluralism of data, processing and interpretations (Johnson & Onwuegbuzie, 2004). Citizen science was a natural choice of method for the data collection phase; to receive authentic data on young peoples' newsfeeds, we needed to actively involve young people in the process. Moreover, by participating, teachers and students would have the opportunity to practice and learn research-based methods for reviewing the credibility of online news. When such methods have been used in previous research on ideologically biased news, results show that students

and paid services (Amazon Mechanical Turk) may provide useful data and categorization for further analyses (Baum & Groeling, 2008; Budak, Goel & Rao, 2016; Ho & Quinn, 2008).

The current project can be categorized as a *curriculum-based* citizen science project, which includes an active involvement of teachers, further promoting learning outcomes of participation (Bonney et al., 2015). Having students engage with credibility issues in their own digital media environments has been recommended for teaching and learning by numerous scholars (Benett, 2008; Flanagin & Metzger, 2008; Jenkins, 2009; Metzger & Flanagin, 2008). As in all citizen science projects, a number of steps needed to be taken to safeguard the quality of the reported data: we developed data collection protocols and forms in close collaboration with interaction design experts in an iterative process involving end users (teachers and students); throughout the project teachers and students had access to instant technical and scientific support via Facebook, telephone and email. Guided by a specially developed digital tool, 2,748 students aged 15 to 19 helped collect and categorize data from their own, authentic news feeds.

2.2 Piloting manual, tool and protocol

Today humans with an internet connection are far better at handling paraphrases, recognizing new false claims, and checking a wider set of claims (Babakar & Moy, 2016; Simonite, 2017). But doing this in a scientific way may be a challenge (Metzger & Flanagin, 2015). To support students in their categorization and review of information we developed a digital tool and a teacher's manual. Both manual and tool were developed in close collaboration between researchers, teachers and interaction design experts, and were based on current findings about how fact checkers navigate the internet to evaluate information (Wineburg & McGrew, 2019). The manual supported the teachers in scaffolding students, and scaffolds were also built into the digital tool, in line with research highlighting the importance of soft and hard scaffolding, not least when conducting research with a large crowd (Brush & Saye, 2002; Sharma & Hannafin, 2007; Pea, 2004; Wolfenstein, 2016).

The tool guided the users through the evaluation process, encouraging them to read laterally and focus on three factors found to support digital literacy skills: (1) awareness of source bias, (2) assessment of the use of evidence, and (3) corroborating information by checking alternate sources (McGrew et al., 2018; Wineburg & McGrew, 2019). "Reading laterally" means using the internet to investigate the credibility of the domain and corroborating the news with other online sources. A first design of the research protocol and the tool was piloted in 5 classrooms by 162 students and 10 teachers. The design included a PowerPoint presentation for the teacher to introduce the research and the news categorization process to the students. After the introduction, students selected news from their own news feeds to evaluate in groups of three, using the tool.

During the pilot we made classroom observations, recorded students' use of the tool by capturing their on-screen navigation and collected user feedback from teachers and students in online questionnaires before and after the pilot. The questionnaires and the news data reported to the database were used to update the protocol, manual and the design of the tool. For instance, we needed to further define what we meant by "news" and "source" in a digital news feed. We also found that the students' review process took longer than expected. Initial technical problems included some difficulties when submitting news containing special characters, and teachers mixing up links to a trial vs the live version of the tool. The collected data from the pilot also informed new ways to design visualizations and user feedback.

2.3 The main study

The data collection process for the main study consisted of the following six steps: (1) teacher uses a provided PowerPoint presentation to introduce the study and how to collect data in a scientific way; (2) all students individually fill out an online questionnaire; (3) all students retrieve the last item in their personal newsfeeds (instructions told students to find "news in your regular newsfeed in the phone e.g. Facebook, Twitter, Snapchat, Instagram, blogs, news sites"); (4) students work in groups of three, using the tool to investigate and submit information on the news; (5) teacher guides the class through the follow-up discussion using statistics from the study; (6) all students fill out an individual online evaluation questionnaire.

In total, 2748 upper secondary students, age 15 to 19, participated in the project. 104 of the 2748 students opted to not allow their data to be used in research. Hence, the results in this paper are based on 2644 students' reviews of news in their own news feeds. The students attend schools all over Sweden. 1231 were year 10 students, 896 year 11 and 517 year 12. The students were enrolled at 19 different programs, but almost 80% studied the national programs of Social studies (30%), Science (19%), Business (19%) or Arts (12%). 57% were female, 39% male and 3% non-binary gender. Students were guaranteed anonymity in all stages of the research process (responses to questionnaires and news submitted cannot be traced back to individuals). All participation was voluntary in line with ethical guidelines (Vetenskapsrådet, 2011). Students could also participate and not allow their data to be used for research.

In all, 2703 reviews were submitted by the students. All reviews were manually processed by researchers to safeguard reliability in the technical functionality of the tool and validity in the evaluations. 87 items were identified as non-valid. About 40 % of the non-valid items were incomplete and 60 % were duplicate entries. Thus, the results are based on the analyses of 2617 reviews.

In order to assess the inter-rater reliability (IRR) between the students' ratings and adult individuals with extensive professional experience of digital source criticism, we randomly sampled 103 news of which two upper secondary school teachers and three researchers, authors of this papers, with backgrounds in journalism and education each assessed 19-21 news items (see Table 1). These ratings were then compared with the students' evaluations of the respective news, resulting in 25 independent IRR assessments (see Table 1). We report Cohens kappa κ) for News type, which is categorical, and for the remaining variables, which are on an ordinal scale, we report ICC (intra class correlations). The ICC was computed using a two-way consistency ICC to assess the degree that raters provided consistency in their ratings of credibility of author, proof, comparison, and general credibility.

The small number of significant ICCs is mainly explained by the students' higher credibility ratings. Comparing student news categorisations with those by researchers and teachers we find that the classification of *type of news* was the same or very similar in 88% of the reviews. Researchers and teachers deemed *the source* to be less credible than students in 38% of the reviews. The same held true for the *evidence* in 48 % of the reviews, and for *comparisons* in 25% of the reviews.

Only 8% of the students' credibility ratings of the *source* were lower than those of researchers and teachers, as were 12% regarding *evidence* and 21% for *comparisons*. The overall credibility rankings of the *source*, *evidence* and *comparison* were the same in 49% of the reviews.

Table 1: Inter-rater reliability between students' ratings and five adult individuals with extensive professional experience of digital source criticism.

	Variable				
Rater	News type (κ)	Credibility source	Credibility evidence	Credibility comparison	Credibility general
Researcher /Journalist	.721 ***	.435 *	.155 *ns*	.267 *ns*	.243 *ns*
Researcher /Journalist	.659 ***	.346 †	.321 *	.101 *ns*	.507 **
Teacher	.557 ***	.178 *ns*	.186 *ns*	.218 *ns*	.179 *ns*
Teacher	.567 ***	.440 *	.236 *ns*	.421 *	.397 *
Researcher /Teacher	.651 ***	.608 ***	- .0273 *ns*	.15 *ns*	.257 *ns*

† $p < .01$ * $p < .05$ ** $p < .01$ *** $p < .001$ *ns = not significant*

Note: F-values and confidence intervals for the ICCs values are available in Appendix A, Table A1. We used irr R package for all IRR analyses (Gamer, Lemon, & Fellows Puspendra Singh, 2012)

In sum, the students' reviews can be regarded as more reliable regarding the *content* of the news feeds (i.e. featured news types) than the *deemed credibility* of the news, where the inter-rater reliability tests and overall comparisons suggest that students' may be less critical than seasoned fact-checkers. However, the present findings shed light on students' perceptions of credibility in a school setting when supported by a digital tool for source criticism.

3 Results

3.1 News consumption

According to the pre-study questionnaire, the students commonly find their news in their cell phones (91%), on TV (59%) or on the computer (50%). The reading of print newspapers was less common (24 %) as was listening to the radio (13%), as noted in previous reports on young Swedes' news habits (Statens Medieråd, 2017, 2018). On the internet the students find news in social media (70%), online tabloids (48%) and via public service TV (34%) and commercial TV (30%). Online, 24% read a national morning newspaper, 19% a local morning newspaper and 14% use international news sites. Half of the students claimed to find news shared in their feeds on a daily basis, 18% weekly, 12 % monthly and 9% every hour. On a scale from 1 to 10 the overall credibility of news was seen as a 5. News perceived as not credible was encountered in their feeds a few times per week by 48% of the students, 31% found such news on a daily basis, 18% rarely and 2% never.

3.2 What news flow in young peoples' news feeds?

When asked to use what they most often use to find news (what is here referred to as *news feeds*) most students went directly to a news site. With a prompt telling them to find the last news in the phone from "e.g. Facebook, Twitter, Snapchat, Instagram, blogs, news sites" about 60 % of the reported news was found on news sites. A majority of the domains were established tabloids, public service and national media sites. Most of the news were classified as reports on *politics, economics and social issues* (Table 2). Almost as common were *accidents and crime*. These two categories, often referred to as "hard news", are dominant in the students' news feeds: 66% of the 2617 news items are hard news (see Table 2). Soft news (*sports*, *entertainment* and *lifestyle*) are much less common (28%).

Table 2: Categories of news in newsfeeds

Genre	N	%
Politics/Economics/Social issues	881	34
Crime/Accidents	832	32
Art/Entertainment	376	14
Sport	184	7
Lifestyle/Food/Health/Medicine	187	7
Other	157	6
Total	2617	100

Separating hard from soft news may of course be problematic, due to blurred lines between categories. However, a closer look at a sample of items coded as *politics, economy and social issues* revealed only news with significant social and political content, for instance: the referendum for independence in the Kurdish part of Iraq; an immigrant clan leader in Gothenburg helping the police reduce violence; a politician from the Swedish right wing party (Swedish Democrats) taking a time out after accusations of sexually assaulting a colleague; Trump at war with Facebook; and a local court overruling a police decision to allow a Nazi demonstration in Gothenburg. A closer investigation of news classified as *crime and accidents* displayed, for instance, the same news on the Swedish Democrat politician, this being news on both *politics* and of *crime*. In both cases the report was coded as hard news. Other examples of *accidents and crime* items were news regarding suspects in a lethal shooting in Las Vegas, and a mosque burning in Örebro.

Looking at soft news, news on *arts and entertainment* included, for instance, stories on: Kylie Jenner becoming pregnant, a new children's book and a singer enraged by questions in an interview on national TV. News on *sports* covered a Norwegian threat to boycott the Olympics in cross country skiing, a soccer star being injured in a car crash, and the selection of the national soccer team. News on *lifestyle, food, health or medicine* included: how showering may damage your hair, a father crying because his son is depressed and how lack of sleep may shorten your life.

3.3 Gendered news feeds?

Working in groups of three during the data collection, the students reported whether theirs was a group of boys, girls or a mixed group. This enabled us to explore gender-based differences in the news feeds. Hard news (politics/economics/social issues and accidents/crime) was dominant in the news feeds of boys and girls in all age groups (Table 3). Some minor differences can be observed regarding hard news, where especially all-boys groups in ages 15-16 (Yr 10) and 16-17 (Yr 11) found more news on accidents and crime than all-girls groups did. In all age groups, girls had more news on entertainment and lifestyle in their feeds than boys. In contrast, boys had more news on sports.

Table 3: Type of news in different groups based on age and gender

		Type of news (%)				
		Politics	**Accidents**	**Entertainment**	**Sport**	**Lifestyle**
YR10	**Boys**	34,8	36,9	8,1	10,6	2,5
	Girls	30,4	27,8	25,3	3,1	8,5
	Mixed	34,9	34,1	12,0	7,4	6,3
	Total	33,7	32,8	15,0	6,7	6,3
YR11	**Boys**	30,4	34,8	7,5	14,9	5,6
	Girls	33,2	31,2	15,8	4,4	9,7
	Mixed	34,7	33,9	12,2	5,7	7,0
	Total	33,4	33,1	12,5	7,0	7,7
YR12	**Boys**	31,3	29,2	11,5	19,8	3,1
	Girls	29,0	24,5	22,0	2,5	12,0
	Mixed	41,2	27,5	11,5	7,7	7,1
	Total	34,1	26,6	15,9	7,9	8,4

The major result from the gender analysis show that digital soft news is distributed in different ways between sexes, with girls showing a considerable interest in entertainment news and almost neglecting sports and boys giving entertainment some consideration but focusing more interest on sport. But overall, girls and boys in all age groups primarily encounter hard news (politics/economy/social issues and crime/accidents) in their newsfeeds.

3.4 Type of news accessed via social media?

As mentioned earlier, most students went directly to a news site to retrieve the latest news (Table 4). News in social media was thus only a part of the students' news feeds. Hard news made up the majority of items from news sites (76%). It was also a major part of news shared on Facebook, the most popular social media for sharing and reading news (50%, see Table 4).

Table 4: Type of news in social media and on other sites

News feed	N	%	Pol./Ec./Soc.	Cr./Ac.	Arts/Ent.	Sports	L./F./H./M.	Credibility
Not social media	1523	58%	38%	38%	9%	5%	4%	7.1
Facebook	760	29%	25%	25%	20%	9%	13%	6.5
Instagram	144	6%	19%	20%	31%	18%	8%	6.3
Twitter	118	5%	54%	19%	13%	6%	6%	7.3
Snapchat	67	3%	15%	24%	36%	6%	8%	6.0

Note: Abbreviations: Politics/Economics/Social issues (Pol./ec./soc), Crime/Accidents (Cr./Ac.), Arts/Entertainment (Arts/Ent.), Lifestyle/Food/Health/Medicine (L./F./H/M). Uncategorized news and five news found in Tumblr are excluded. All percentages have been rounded to full percentages.

On Twitter, hard news was also the dominant category. Especially news on politics, economics and social issues were prominent in Twitter feeds. Soft news was more frequently found on Instagram and Snapchat, where stories on entertainment, sports and lifestyle, made up 57% and 50%, respectively, as compared to 43% on Facebook (Table 4).

3.5 Credible news?

For every news item, the students used the tool to evaluate the three components *source*, *evidence* and *corroborating the information in another independent source*. Each component was classified as *credible*, *neutral* or *not credible*. In total, students found 10% of reported items to be *not credible* with regards to at least one of the three components (see Table 5). 67% had at least one component classified as credible while 23% received a neutral score. When grading the news on an overall credibility scale from 1-10, students gave their news an average grade of 6.8.

In Table 5 we find that hard news was deemed to consist of, for the most part, credible components. Looking at the individual components, about 70% of hard news received a *credible* (C) score for each component. The corresponding figure for the *not credible* (NC) score for hard news is around 7 percent. However, slightly less than half of the hard news (48% and 49%, respectively) received a C score for *all* components. Conversely, a small minority of hard news received a NC score for *all* components (11% and 3%, respectively).

A closer look into this proportion of not credible politics news reveal items on immigration and right-wing conspiracies from sites such as Infowars, Nya Tider and anonymous internet forums like Flashback. The remainder of the politics news receiving NC scores for all components consisted of reports and op ed pieces from the news site Nyheter 24 ("News 24"), satire items or hoaxes from sites like World News Daily, Rochdale Herald and 9gag reposted as news on social media, news on climate change from popular science magazine Illustrerad Vetenskap [Science Illustrated] and reports about the end of the world from the viral site lajkat.se.

Table 5: Type of news and credibility

			Avg. credibility	Source (%)			Evidence (%)			Corroboration (%)			All NC (%)	All C (%)
Genre	**N**	**%**	**(1-10)**	**NC**	**N**	**C**	**NC**	**N**	**C**	**NC**	**N**	**C**		
Politics/ Economics/ Social issues	881	34	6.9	8	23	70	8	22	70	7	22	70	11	48
Crime/ Accidents	832	32	7.0	9	17	74	6	23	71	8	22	70	3	49
Art/Enter-tainment	376	14	6.4	17	27	56	18	22	60	17	27	56	8	37
Sport	184	7	8.0	3	17	80	7	20	73	4	17	78	2	60
Lifestyle/ Food/Health Medicine	187	7	5.7	19	30	51	19	30	51	18	31	51	6	5
Other	157	6	6.7	14	22	64	13	17	70	11	25	64	4	45
Total	2617	100	6.8	10	22	68	10	23	67	10	23	67	4	44

Note: Type of news classified as not credible (NC), neutral (N) or credible (C). Two rightmost columns show percentage of news with all three components classified as credible or not credible.

A number of not credible news reports on *crime and accidents* came from Nyheter 24. In the students' comments, the popular site was identified as a clickbait site posting misleading headlines, publishing poorly written news items, lacking in evidence, by unskilled reporters. Negative comments also mentioned ads looking like hard news, so called *native advertising*. The students found a similar site, Newsner, to base its news on established international news sites but making the facts come out wrong. Immigrants and crime was described on Fria Tider

and in reposts on Twitter from a German right wing Party (AfD). Reports on killer clowns were published on sites like lajvo.se and Nyheter 24. Some items from the established national tabloids Aftonbladet and Expressen were also among the not credible news. It is noteworthy how news classified as NC with regards to one component (source, evidence or corroboration), could still receive C's for other components. For instance, of the 20 % of reports on accidents and crime that were classified as NC in the corroboration component, 16 % had a C rating for evidence. This phenomenon is also evident from Table 5, where the two rightmost columns display percentage of news with all three components classified as C and NC, respectively. Regarding soft news, sports news was deemed to be more credible than the two categories arts/entertainment and lifestyle/food/health/medicine. Only 3% of the news on sports were found to be coming from not credible sources as compared to 17 % and 19 %, respectively, for entertainment and lifestyle (see Table 5). Sports news had the highest percentage of items with all C components (60%), and the lowest percentage of all NC components (2%) among all news categories. Furthermore, sports news scored an average of 8.0 on the credibility scale from 1-10 while entertainment scored 6.4 and lifestyle 5.7. The sports news seen as lacking in evidence or corroboration were mostly related to speculations regarding player transfers.

Entertainment news identified as not credible included speculations on the assumed pregnancy of reality TV star Kylie Jenner. Circa 16 % of the news categorized as entertainment covered this particular story, reported by CNN and celebrity news sites like toofab.com and hant.se. Focus on celebrity relationships and emotions was a common denominator for NC entertainment news.

News on lifestyle, food, health and medicine is a mix of hard news reporting on scientific discoveries and soft news about for instance travel and leisure. News in this category had the lowest average credibility (5.7) and was given below average credibility scores on all three components. As can be seen in Table 5, lifestyle has an exceptionally low percentage of news graded C for all components; and the only category to have a higher percentage of news graded NC than C for all components (6% vs 5%).

Examining the domains of all the 2617 news reviews, we see that the top five domains are Aftonbladet (national tabloid; credibility rating 7.9 out of 10), Expressen (national tabloid; 7.7), Nyheter24 (viral news website; 5.7), Dagens Nyheter and Svenska Dagbladet (national morning papers; 8.3) and public service TV and radio (8.7). News on *politics, economy and society* mainly came from established mass media. 52 % of news in this category came from sources classified as credible. Here public service TV and Dagens Nyheter have a strong position along with Aftonbladet and Expressen. News covering *crime and accidents* were also primarily found in the domains of established media. The tabloids were slightly more prominent in this category, as was Nyheter24.

Credible sports news generally came from above-mentioned tabloids, but also from new media outlets based in media and journalism – Fotbollskanalen ("The Football Channel") and Hippson (a horse magazine). The students classified Hippson as a credible source in eight out of ten of its news, and Fotbollskanalen was noted as a credible source in all its reported news (n=10). Boys-only groups classified 75% (n=67) of sports news to come from credible sources; the corresponding figure for girls-only groups was 85% (n=58) and for mixed groups 84% (n=96).

In contrast, news on *lifestyle, food, health and medicine* primarily came from Nyheter24 – a source classified as not credible in 38% of the reviews. A mix of soft and hard news was published by tabloids and public service TV, but also by expressnytt.se – a viral news site. The site was deemed as a not credible source in 50% of the reviews.

Arts and entertainment news primarily came from the tabloids and Nyheter24. Such news also came from the entertainment website hänt.se (a gossip magazine), deemed to be a not credible source in circa 40% of the reviews. Girl groups classified far more news on entertainment (n=182) and lifestyle (n=83) from their feeds than boys (n=40 and n=18, respectively).

4 Concluding discussion

Access to credible news has been highlighted as a fundamental condition for democracy, and informed citizens are pivotal for a constructive societal debate and decision-making. Seeing young people's news engagement as a cornerstone for current and future societal engagement, we explore the mortar of that cornerstone – their news feeds.

Through our collaboration with students we have found that news on *politics, economics, and societal issues* is common in their news feeds, as are reports on *crime and accidents*. In other words, so called *hard news*, make up the lion's share of their feeds. *Soft news* (sports, arts and entertainment, lifestyle, health and food) is less common. Comparing boys-only and girls-only groups, we see that both genders primarily encounter hard news in their news feeds. The main difference between genders can be found within the arena of soft news. Boys find more news on sports while girls find more news on arts and entertainment, lifestyle, health, food and medicine. This indicates a gender-based distinction in how Swedish upper secondary school students engage with news.

The samples that we analyzed more in detail showed that hard news items were sometimes classified in different hard categories by different groups (e.g. a politician accused of sexual assault, classified as politics/crime). In this aspect, the lifestyle category is more complicated as it mixes hard news (e.g. of research) with soft news (e.g. on leisure and individual narratives). To address this complexity we need to further develop the assessment protocol of news *content* and news *form* in the digital tool, dividing them into two different variables to be classified by the user.

Looking at sources, the nature of the news feeds varies between different social media channels and news found outside social media. There seems to be a correlation between types of news and the credibility of the sources. For instance, the students' low overall credibility ratings of lifestyle and entertainment news is partly a result of low *source* credibility reviews for certain social media channels. Instagram and Snapchat hosted a considerable share of such soft news and are deemed to be less credible sources than Twitter and Facebook, who carry more hard news (see Table 5). It is also evident that news found *outside* social media feeds are somewhat more credible than news shared via social media. There seems to be a link between source and content that has an effect on how credibility is perceived.

4.1 Sources and credibility

The fact that a minority of news reported in the present study stem from social media feeds, could indicate that young people's news to a large extent is *found* rather than *shared*. The circa 42% of news shared via social media, predominately come from Facebook. The results also show that different social media is used to share somewhat different types of news. Instagram and Snapchat is used for entertainment and sports while Twitter is for reading and sharing news on politics. Facebook holds more soft news compared to common news sites. Thus, social media, in general, seem to be used for sharing soft news rather than hard news.

News reported by young people in this study was to a large extent classified as quite credible. Only one out of ten news items was identified by students as not credible when scrutinizing the three components *source*, *evidence* and *corroboration with an independent source*. And the 2617 news received an average credibility score of 6.8 (scale 1-10, Table 5). As we note in the inter-subjective reading, students tend to be more trusting towards news reports than researchers and teachers. Thus the actual credibility of the news feeds may be slightly lower than what the reports suggest. However, it is clear that what students read and share in the present study has often been vetted by journalists. As most news comes from established media sites, the results are in line with previous research, even if we need to bear in mind the limitations of this study regarding students as research assistants (Budak, Goel & Rao, 2016).

When comparing these findings with results from our pre-study questionnaire, we see that the two convey slightly different pictures. In the questionnaire, 70 % of students reported finding news via social media, 48 % in online tabloids and 34 % via public service websites. The overall credibility of the news was a 5 (on a scale from 1-10), and not credible news were encountered daily by 31%, a few times per week by 48% and rarely by 18%.

A possible reason for this discrepancy could be that students are not always aware of their news habits when they self-report (Jervelycke Belfrage, 2016). The group setting could also have an influence, as students may have been inclined to pick or exclude certain kinds of news from their feeds for their group discussion. Thus, it cannot be excluded that the actual newsfeeds of the participating students may differ from our results, in reality holding a higher percentage of news shared via social media, and of slightly lower credibility. A different study design is needed to capture this question, for example including more items from each student's newsfeed, in a consecutive list. And it is evident that students' knowledge and media habits need to be addressed in empirical studies not just by self-reports.

The credibility concept could also be addressed with more attention to detail and complexity. We tap into dimensions of credibility focusing on the source, the media text (its content and form) and the context of the media text. Studies of credibility have focused on sources, content and the media used, and adopt more objective or subjective perspectives to the assessment of credibility (Metzger and Flanagan, 2008). Of importance is also if credibility is approached on a general level or on a more detailed level and with specific aspects of credibility in focus. As we have seen here, credibility in news can be attributed to a media type (TV, radio, web), a specific media organization (SVT, SR, Dagens Nyheter or Nyheter24) or a specific news item selected for evaluation.

Studies of young people's perception of credibility of web news media also pave the way for studies on how this affects their trust in the news and in media. Both credibility and trust need to be clarified to deliver new knowledge on how the politics, the mediated communication and pedagogics of digital media credibility operate and should be addressed.

4.2 A democratic challenge

Our finding that students in upper secondary schools read news on politics, economy and societal issues from established media sites may be seen as a contrast to often discussed polarizing online information consumption (Bessi et al. 2015; Del Vicario et al. 2016; Sunstein, 2007). Rather than sharing biased news from extremist sites, this study records young people following societal issues through established news media. The impact of filter bubbles (Pariser, 2011) on adolescents may be important, but our results indicate that they tend to go directly

to news sites, thus sidestepping more narrowly selected and biased news in social media feeds (Flaxman, Goel & Rao, 2016). In their digital worlds, the students will primarily encounter news reviewed by professional journalists.

Our findings imply that young Swedes primarily navigate online tabloids with free access. This may be interpreted that they are not very interested in quality news, in line with previous research (Bennett, 2015; Sternvik, 2010). On the other hand, it may also be a reflection of an interest in news from established media sites with reasonable quality and credibility, without paywalls. Newspapers deemed to be more credible in this study have paywalls, making them only accessible to students with a subscriber's account. This is a democratic challenge, considering the importance of all citizens having equal access to quality news. Currently there is a digital media divide between young people with and without access to a large portion of the most credible news, which may very well add to other digital divides due to social situation (Hargittai, 2010; van Deursen and van Dijk 2014). Furthermore, as news may play a central role in political engagement, it is problematic that access to news is a matter of socio-economic status (Kruikemeier & Shehata, 2017). Countering this digital news divide is online public service news, being highly credible and accessible to many young. However, the lack of free and equal access to the most credible newspapers still remains a problem.

Though most credible hard news in the present study came from credible sources, the students also submitted a number of politically biased news on migration issues and crime. Sources for this news were online extreme right-wing journals and internet forums, but also social media. These news items present a racist view on society, describe foreign religions as cultural threats, and tell stories of conspiracies behind war on terrorism. The number of reported items with this kind of content is very limited, but we need to bear in mind that the study design, with collaborative investigations in classrooms, may not capture feeds young people wish to keep secret from their classmates.

Furthermore, while students in this study classify news with politically biased content as not credible, they may not have the skills and experience to do this without the scientific and technical scaffolds provided in this setup. In light of theories of media literacy (Livingstone, 2004) we primarily investigate the *access* to and *content* of digital news media, and not the *ability* to evaluate credibility, but through the students' assessment of the credibility we also address their *evaluation* of the media.

In the context of democratic challenges, our finding that biased news primarily seems to be found among soft news may be seen as reassuring. But biased soft news can be problematic for many other reasons, such as manipulating self-esteem and economic priorities. The perceived low credibility of news on health and medicine may impact decisions related to personal health. Also, news on climate change was noted as not credible, highlighting the importance of promoting a scientific worldview.

In sum, and in contrast to previous research, this study suggests that young people read and share predominately news that may be considered credible. Hard news comes from established media while soft news is retrieved from less credible sites. This might indicate that young people select hard news more carefully than information for amusement, but it might also be interpreted that they make use of prior perceptions of credibility in making the selection. Further research is needed to verify the results and to investigate young people's ability to evaluate the credibility of digital news and how that evaluation might impact their selection of news. Case studies on certain high-profile media coverage events – such as general elections – could also provide valuable insight into how young people are exposed to, and interact with, hard news of varying credibility.

4.3 Implications for teaching and learning

The result that students find and read news from established media outside of their social media feeds can be regarded as a constructive habit that education should encourage. This may counter segregated networks described in previous research (Del Vicario et al 2016; Schmidt et al., 2017; Boyd, 2014). If we wish to support communication across socio-economic and socio-cultural borders then balanced news may be a way to support democratic communication. Not least since we, in line with previous research (Budak, Goel & Rao, 2016), find that news in established media is usually not very biased. Discussing news from students' own news feeds may benefit teaching practices and provide a productive way to connect formal education to roles as democratic agents outside the classroom (Biesta & Lawy, 2006; Olsson, 2016). Constructive teaching practices may benefit from an updated connect to students news feeds (Olsson, 2016). Thus, from a pragmatic point of view we find a lot of credible news in the feeds which certainly may be constructive to connect to in education.

It is possible that education may stimulate "the networked young citizen" to play an active role in society even if he/she is skeptical to conventional politics (Loader, Vromer & Xenos, 2014). Scaffolding students to access credible news may be a way to push their democratic conversation towards a more informed starting point (Ekström, Olsson & Shehata, 2014; Lee, Shah & McLeod, 2013). This is a central task for education, not least since it has been noted how a socio-economic divide may be fueled by different news habits. The ability to find credible information in an age of information overload is vital, and to bridge this part of the second digital divide (Hargittai, 2010; van Deursen & van Dijk 2014) school needs to make sure that all students know where and how they can access credible news.

At a concrete level, teachers can help students map out useful apps and sites with credible news available online. This is of course not an easy task. A tentative starting point can be that tabloids seem to be the main source of hard news, for young Swedes. In school this needs to be addressed, in critical and constructive ways. Education can stimulate democratic discussions starting in credible information. But students also need to pay attention to biases. Teachers may ask students to critically evaluate their own news feeds – as in this study – based on the three components *source*, *evidence* and *corroborate information*, and reading laterally like professional fact-checkers do (Wineburg & McGrew, 2019). The impact of this method of teaching and learning needs to be further investigated, but based upon our current knowledge it seems constructive. In future research it is central to better understand students' challenges when navigating online news and how education may support constructive habits of mind (Litt, 2013; McGrew et al, 2018).

In teaching it is important to address the biases of different types of news. Thus, commercially biased information also needs to be considered critically in education. Also in this case it is central to consider the credibility of information in informed ways and also discuss ethical problems with manipulation to make people feel bad about themselves to make them more willing consumers. Bearing in mind gender differences identified in this study, it may be important to highlight the credibility of entertainment and lifestyle news for girls. Our findings indicate that it may be useful to be a bit more skeptical to news shared via social media than found on sites; even if we trust our friends.

In teaching and learning it may certainly be a challenge to navigate false or unscientific claims, but previous research indicates that a constructive way to counter false information is to focus on the facts (Jolley & Douglas, 2014; van der Linden et al., 2017). Presently, this is of high relevance, as certain actors accuse established media for systematically producing fake

information. Our study suggests that Swedish 16-19 year-olds have a lot in common in their reading and sharing of news, but also with regards to their view of this news' credibility. Supporting habits to access credible news and to evaluate their credibility seems like a constructive way for education to take on the democratic challenges of new media – and many students seem to do this already.

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