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Adaptive Signposts out of the Echo Chamber: Enhancing Argumentation in Social Networks

Raluca Judele, Armin Weinberger*

Abstract

Social networks such as Facebook allow for participation in debates on socially and politically relevant issues. Facebook is a strong agenda setting medium, making participators both consumers and distributors of information and opinions. Considering the strong effect of Facebook on the reinforcement of one's own (political and social) attitudes and beliefs, how can we facilitate deliberate argumentation in social media? Could we help developing informed and active debaters through scaffolding their argumentation with scripts that are tailored to participators' personality traits? Here, we discuss the need and ways to support argumentation with adaptive scripts in social networks to foster critical, argumentative discourse. For this purpose, we present a new approach to individually facilitate and analyze sound argumentation in the wild by help of a Facebook app, enriching the personal experience of social media as a medium for critical participation rather than affirmation of held views.

Keywords: *social media; CSCL; adaptive scripting; personality traits.*

1. The use of social media in opinion formation and debate

Social media are persuasive examples of how information and communication technologies (ICT) shape the way we build opinions and knowledge as well as how we present ourselves and participate in society. With access to massive amounts of information and possibilities of sharing arguments that build on fact and reason rather than on status and power, hopes rose of advancing discourse on a global scale. Given the fact that information is tailored to users in non-transparent ways, however, social media appear to develop echo chambers or filter bubbles, which perpetuate and enforce stances beyond sound, fact-oriented argumentation. Approaches to profile people for targeted advertisement have recently been discussed to sway political processes (Grassegger & Krogerus, 2016). Instead of personalizing information, we want to discuss here how we can personalize support for

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online argumentation for enabling critical and deliberate debate on social media and critical assessment of given information and their sources.

1.1 The use of social media in opinion formation and debate

Globalization and "balkanization" (Rosen *et al.*, 2011) are trends that appear to proliferate simultaneously through online communication. Public perception and debate of these trends deviate from evidence. Earlier research can be illustrative for how media are being perceived and actually used. For instance, with the advent of television, theories and fears emerged about how civic participation and the feelings of community would change by people being isolated in their homes watching TV instead of participating in the outside world and connecting with each other, describing a so-called bowling alone phenomenon (Putnam, 1995). Similarly, critical views of isolated consumers emerged concerning the adoption of Internet, collecting evidence of growing social disconnection and indisposition (e.g., Kraut *et al.*, 1998). With the introduction and growing of Web 2.0 since the late 2000's, this field has risen anew as arena of social connection and social, informal learning (Ellison *et al.*, 2011). Being far from only offering a possibility to post pictures of private life, social networking sites (SNS) are also widely used for political information. Especially for young participants, SNS are reportedly more important than newspapers or television for getting informed on various news (Marchi, 2012). Additionally, social media are used for sharing information about political and personal development. On Election Day 2012, more than nine million Facebook users clicked an 'I voted' button, to let their friends and possibly the world know they had participated in the US election (Bakshy, 2012). More than a third of Americans who use SNS report using them to like or promote materials related to politics and social issues, with 34% posting or commenting on these topics (Rainie *et al.*, 2012).

1.2 Civic participation on social media

Now, are social media a public space for reaching out to others and connecting with diverse ideas throughout the world or a backroom for reaffirming similar and invariable views? It has been presumed that social media could lead to a decline in civic participation and deliberate practice, as it —being part of a potentially isolating network of the Internet—constrains from taking part in diverse debates happening in real life between people, limiting social capital of users (Shah *et al.*, 2009). But taking it more as an enrichment than a limitation, social media provide spaces for various debates and communicative practices, which could lead to an increase of civic participation. Here, civic participation involves behavior aimed at resolving problems of the community (Zukin *et al.*, 2006). There is evidence that social media are being used in different and very directed ways for prosocial and civic participatory purposes. For instance, MySpace

profiles were used to organize politically motivated marches (Costanza-Chock, 2008) or online sites have been reported to be used for searching for campaign volunteers. For the Obama election campaign in 2008, Facebook groups have been built to recruit campaign helpers, with reported success. Taking part in collecting social media clicks and likes has shown to be an effective strategy for election campaigns (Barbaro, 2015; Confessore & Yourish, 2016; Stein, 2016).

1.3 Motivation for using social media

One important factor fostering usage of social media for civic and political participation seems to be the motivation of people (Shah *et al.*, 2009). What are the intentions and expectations of using social media? People could process and aim to portray reality in a fact-oriented manner, eventually accommodating their views. Then again, people may tend to select their online niche and assimilate information for strengthening and consolidating their already existing world view. This approach may lead to the echo chamber or filter bubble effect, which denotes people's tendency to stick to information that fits their already existing world view.

Regardless of an echo chamber effect, the quality of shared information and arguments online tends to be rather low, superficial and sometimes information are even incorrect. So, different examples and data is pointing at the dilemma of political debate devoid of sound argumentation. In SNS, discussions tend to have a very emotional and low-quality style. What could we do to enhance quality of argumentation? Classic approaches of learning to argue refer to formal approaches of logic and discuss argumentation fallacies: in the area of Computer-supported Collaborative Learning (CSCL) research, learners are to engage in joint elaboration of a problem space using computers, enhancing both their argumentation skills as well as their fact knowledge. This approach could therefore be an answer to the question of how to enhance elaboration and quality of online discussions.

2. Argumentative Knowledge Construction (AKC)

In CSCL research, Argumentative Knowledge Construction (AKC) encompasses 'arguing to learn' and 'learning to argue'. Whereas 'learning to argue' focuses on how argumentation practices and skills can be developed and trained, 'arguing to learn' acknowledges both argumentation as a scientific practice of creating, sharing, and reviewing knowledge as well as a learning practice of elaborating learning material by constructing arguments. When arguing about a certain topic, learners need to know and use different arguments and evaluate their quality, direction and validity. AKC has been investigated in the context of CSCL due to its theorized added value for individual, but also group level learning outcomes in line with social theories of learning. AKC is the deliberate practice of elabo-

rating learning material by constructing formally and semantically sound arguments with the goal of gaining argumentative and domain knowledge: the more learners elaborate a problem space, the more learners explore said problem space, activate prior knowledge, and build new knowledge (Weinberger & Fischer, 2006). Learning in this scenario can be explained by the fact that learners jointly elaborate a topic or problem by taking and finding evidence for multiple perspectives (Andriessen *et al.*, 2013). Argumentation involves justification of claims and rebuttals, anticipating counter-arguments, and co-constructing syntheses.

2.1 Argumentation scripts

AKC can be enhanced by argumentation scripts, which are among the most prominent approaches to foster AKC in CSCL environments (Noroozi *et al.*, 2013; Scheuer *et al.*, 2010). Scripts specify, sequence, and distribute roles and activities among learners. There are different script families that may support different types of interaction patterns: a peer review script schema, for instance, foresees opposing roles leading learners to critically discuss divergent viewpoints (Weinberger *et al.*, 2005). Scripts can also promote individual activities to provide learners with time for individual preparation and reflection on different perspectives, they can define opposing roles for learners to critically evaluate different viewpoints or promote extra time for different activities (e.g., Asterhan & Schwarz, 2007; Baker, 2009; van Boxtel *et al.*, 2000; van Dijk *et al.*, 2014; Weinberger *et al.*, 2005). Scripts can also prompt learners, for instance, to provide support or counterarguments for their claims, which is often realized by sentence openers in the text boxes through which learners communicate. This can help learners elaborate the argument, consider multiple perspectives, and gain argumentative knowledge (Weinberger *et al.*, 2010). Successful collaboration, often supported by scripts, leads to knowledge co-construction through argument elaboration (e.g. Baker & Lund, 1997; Stegmann *et al.*, 2012; Weinberger *et al.*, 2010). Knowledge co-construction as the result of AKC has been shown through measures of knowledge convergence, indicating the degree of overlap in knowledge gained between learning partners (Weinberger *et al.*, 2007). Argumentation scripts can be implemented with relatively simple means: prompts, like sentence openers, to provide support and evidence or counterarguments for claims can help learners elaborate their arguments, consider multiple perspectives, gain argumentative knowledge (Weinberger *et al.*, 2010) and resolve conflicts productively (Baker, 2003; Belland *et al.*, 2008). By guiding learners with argumentative scripts, a lack of argumentative knowledge can be ameliorated and the quality of discourse enhanced, which can have positive effects on learning (Weinberger *et al.*, 2010). Argumentation scripts could also be applied in individual learning scenarios (*Ibidem*), although with less success as in collaborative scenarios, possibly because scripts reduce collaborative process losses, but may also interfere with individual internal scripts (Fischer *et al.*,

2013; Weinberger, 2011). This interference may be counterbalanced with adaptive scripts, tailored to discussants' needs.

2.2 Scripting deliberate argumentation in social media

With SNS communication being associated with non-critical talk and superficial social self-presentation, scripts that facilitate learners' reflection and focus on the task could have large effects on learning in SNS like Facebook. However, there is little understanding of how scripts could be designed for SNS and how scripts would foster reflection of individual learners when constructing arguments in Facebook. Scripts may vary in how much and how detailed a structure they provide and how many degrees of freedom they foresee. Hence, script acceptance may vary, too, and scripts may need to be adapted to individual learners and their respective needs.

But why do we even need scripts, is argumentation something we must learn? Indeed, a growing body of research has shown that attaining high levels of argumentation is difficult across the life-span and not many persons achieve those levels not even as adults (Erduran & Jiménez-Aleixandre, 2008; Garcia-Mila *et al.*, 2013; Kuhn, 1991; Osborne *et al.*, 2004;), which leads to the question whether it is a competency harder to accomplish than others. Argumentation can be ameliorated through training and the usage of, e.g., scripts. This training normally takes long time to be effective, and enhancing argumentation skills may not automatically foster factual knowledge, but underlying skills of general understanding, autonomy, emancipation in building and arguing about the world. Crucial part of deliberate argumentation in this approach is challenging one's opinions. Deliberately taking into account various views other than one's own enables a change of opinion.

Opinion change is a complex phenomenon and an often gradual process that is not easily induced and also has to be differentiated from acquisition of knowledge: there is not one single correct answer when talking about opinions in contrast to facts. Opinions are not to be corrected or rejected, but they can be expressed in a more or less qualitatively high way or can be elaborated more or less. By elaborating arguments, people reconsider and think deeper about a subject without being forced to uptake a certain strategy. Argumentative scripts can be applied in SNS, but script effects on opinion change may vary and depend on how learners are guided to challenge their views (Tsovaltzi *et al.*, 2015). Furthermore, while script effects appear to be relatively robust in restricted lab and training contexts, users of social media may feel disturbed and their autonomy being threatened in otherwise informal learning contexts. With users typically not seeking to change their opinion or to learn about good argumentation, consumption of public and private social information and self-representation are in the foreground. Awareness for argumentation and its impact on themselves and others may be low. Therefore, users may need to develop argumentative awareness to facilitate reflective and productive discourse taking into

account multiple perspectives. So, the question arises if in SNS—compared to standard CSCL settings with a specific learning goal—there need to be different, subtler approaches, which do not aim at blatantly enhancing knowledge or skills of persons but rather at subtly reframing the social experience in SNS for deliberately discussing and sharing opinions with others, while constantly reshaping opinions according to new information, critically reviewing arguments, and thus, broadening their own viewpoints. Scripts in this way need to be gentle nudges, reframing users' approach on what they post. This serves to maintain users' agency and interests, yet facilitates reflection on their own and others' arguments.

3. A call for novel forms of analyzing and subtly enhancing argumentation in social media

Social media may fuel both, deliberation of users as well as selective exposure to reaffirming stances (Colleoni *et al.*, 2014). SNS such as Facebook enable high levels of interactivity and allow for diffused and real-time discussions independent of social status and position (Rafaeli & Sudweeks, 1997). Hence, SNS could strongly contribute to 'viral' diffusion of information, favoring any standpoint coming along first.

3.1 Psychological mechanisms of echo chambers

There are various psychological mechanisms at work supporting a scenario of echo chambers. Classic psychological findings can be consulted about why people choose—willingly or not—to dismiss potentially important information, for instance, building on theories about cognitive dissonance, confirmation bias or group think phenomena.

The theory of cognitive dissonance (Festinger, 1962) is able to illustrate how people feel cognitively dissonant when encountering inconsistent information to their own opinion and point of view, and try to dissolve this emotionally disturbing dissonance by different strategies, e.g., deciding to not take these inconsistent pieces of information into account or discarding them as futile. Applying this basic human cognition theory to the world of Internet use and uptake of political information and deliberation, people may focus only on news and discussions that fit their own point of view.

The general urge of people to consume information that confirm their original opinion more than contradictory ones can be explained by the confirmation bias (Wason & Johnson-Laird, 1972). Considering the fact that Facebook as well as Google use algorithms to detect and contribute to interests of users and select pieces of information upon that interests, these SNS contribute to building an echo chamber. It has been shown that inducing counter-preferred information in individuals can lead to a decrease in confirmation bias (Schwind *et al.*, 2012), however, the exact opposite is happening with the big engines as Facebook or Google offering the pre-

ferred information and hence increasing the ratification of a confirmation bias.

This process could lead to a situation where people increasingly read more from and discuss with peers that have a similar opinion, creating a wide-spread group which only fortifies this given opinion, possibly leading to groupthink processes and behavior, which is defined as a "deterioration of mental efficiency, reality testing, and moral judgment that results from in-group pressures" (Janis, 1982: 9)—only that now the group represents the wholeness of users applauding and building on the own opinion. These psychological phenomena, to name only a few, can ultimately strengthen an 'echo chamber' effect. Users' interests mainly attract similar peer statements. These statements complement, but do not contradict their own opinion. Hence, held opinions echo back to users, while new input challenging held or creating new viewpoints is restrained (Kushin & Kitchener, 2009; Stroud, 2010). New approaches may need to be called upon for helping users of social media to assess information in a critical and comprehensive way.

3.2 Analyzing behavior traces on social media

Understanding the important factors for enhancing user experience on Facebook requires inspecting existing influences on user opinion and behavior. So far, there have been various approaches to analyze and describe what is going on in social media concerning discussions and liking of pages and profiles and how to influence user behavior and beliefs. Collecting user data in SNS for scientific purposes and more so, for economic reasons is common practice. Terms like data mining, big data, and search and information algorithms are well-known today as all user information are tagged, collected and mirrored for purposes of advertising, shopping or suggesting websites as well as filtering of Facebook friends' posts. Easily acessible data concerning behavior and Likes can be used to automatically and accurately predict a variety of personal attributes, being able to highly reliably predict e.g. with an 88% correctness, the homo- or heterosexuality of a person or with 85% correctness whether that person is Republican or Democrat (Kosinski *et al.*, 2013). Also, certain personality traits can be predicted automatically using only a regression model and given information from social media and no human involvement with sometimes similar results in accuracy as psychological personality tests (Bachrach *et al.*, 2012; Youyou *et al.*, 2015). Companies apply user information for their benefits and purposes for personalized marketing. Companies build user profiles by collecting data from the websites they are advertising in, e.g. Facebook. This data can comprise the likes of a person, the network he or she is involved in and the content of their posts or what kind of music, films, websites, or political party the person is interested in and reads a lot about. After building a profile of that person, suitable products or other offers are ultimately shown (Kosinski *et al.*, 2014). For instance, if a young woman

who has the profile information to have married her partner likes sites, profiles or pictures related to babies in a high rate, the probability that she will see advertisements for maternal or pregnancy products will rise. This is also true for the posts of their Facebook friends or followed pages as Facebook's filter algorithm offers mostly posts from friends which concur with other information from that person, hence creating an echo chamber and suggesting that the own opinion or the own interest is a dominant one in the rest of the social media world by exaggerating the commonness of that topic. This can be said to resemble the non-digital form of meeting in a group of regulars, exchanging the ever same information and sticking to the opinion of the group.

3.3 Experiments on social media

Beyond collecting descriptive data in social media, researchers have gone ahead and set up experiments in social media, manipulating context variables or intervening in social media discussions to test hypotheses. Some of these experiments address how users can be subtly 'nudged' out of the echo chamber. There have been attempts to address actual racist harassments in existing groups on Twitter with bots suggesting a white man or a man of color with high or low number of followers. These bots responded to hateful comments with a standard sanctioning post (Munger, 2016). Racist tweeters reduced hate speech when sanctioned by these bots, reminding them not to hurt anyone's feelings and not to be racist. The effect, however, only took hold if the used bot was a white male with high number of followers—as was the racist tweeter (*Ibidem*). These findings align with psychological findings about the influence of in- and out-group members on formation of opinion and decision, where in-group members always exert greater influence than out-group, considering strong, functional groups (e.g., Mullen *et al.*, 1992). SNS prove to be an arena of online social discourse reproducing psychological mechanisms found in face-to-face interaction. Taking that into account may aid in further differentiating and testing human behavior in social media. Conducting experiments in social media may allow for large-scale applications of behavioral approaches while keeping in mind specific hurdles and affordances of that medium, e.g. legal barriers (Shapiro & Ossorio, 2013), or known obstacles when trying to transfer lab experiments and methods to field settings (Tsvoaltzi *et al.*, 2015). Also, one other thing must not be forgotten. In addition to basic and general (group and social) psychological mechanisms scaling up online, individual human personality greatly influences behavior and perception. We posit that differences in personality must be taken into account when adapting SNS experience for users for not overriding personality specifics of individuals.

4. Personality traits on social media: the role of thinking styles

For being able to adapt SNS environments for users by giving them tailored scripts, their personality needs to be taken into account. Personality is something in which people differ from each other. To measure traits of personality, there are many possibilities, among them the most general and broad personality taxonomy of the Big Five model, which is one of the most known and well-spread approaches in differential psychology. It differentiates between the five factors Extraversion, Neuroticism, Agreeableness, Openness to Experience and Conscientiousness (see e.g., Goldberg, 1990). Personality can also have influence on the usage of SNS: empirical evidence shows that users with high levels of openness use blogs, media-sharing sites, user reviews, and wikis more often than their counterparts with lower levels of Openness do (Kim *et al.*, 2014).

4.1 Personality influences cognitive tasks

Learners differ in personality traits, too. These personality traits influence how persons deal with everyday problem solving, as well as learning as a part of their individual routine. Certain personality traits go well with certain learning strategies, which consequently have an impact on learning experience and outcome itself. The Big Five Personality model, which does not directly assume learning behavior differences in its basic theory, seems to be able to explain certain learning strategies, as Komarraju and Karau (2005) found significant loadings of Neuroticism and Openness to avoidance vs. engagement with learning content. In research on learning it is found that different learning styles derive from personality factors and influence how goal-oriented students go about learning (Blickle, 1996). Wang and Hsu (2012) found differences in the quality of performances of virtual teams when the teams were formed of different combinations of extraverted and introverted members. Some traits according to the Big Five also significantly correlate with the personality dimensions of the Myers Briggs Type Indicator (MBTI), another taxonomy of personality description often used in economic settings, but also e.g. for schools (Furnham *et al.*, 2003). For this, there are implications on how learners with a certain distribution on the MBTI dimensions should be instructed in schools or companies, but so far there is no empirical evidence for these assumptions. It could seem a sensible approach to test for personality traits and see if instructions on how the corresponding traits influence learning styles are to be applied in the same manner, i.e. what kind of scripts would be most beneficial for learners.

4.2 The theory of mental self-government

The more global and towards learning content directed theory from Sternberg (1988) is concerned with thinking styles, which he proposes to

be important factors when it comes to the basic approach to learning material. The Theory of Mental Self-Government (Sternberg & Zhang, 2005) proposes that a person governs his or her own life and learning experience in a self-organized manner just like a country or state does govern its affairs, as overt political structures are just a resemblance of possibilities how humans organize and govern themselves. So, very much like a political government, persons tend to be organized in a specific way for their styles of learning. Style is hereby understood as a preference of how to approach information, not the general capability of dealing with information (*Ibidem*). This theory differentiates between functions of the mental self-government, which are Legislative, Executive and Judicial, forming the broadest and most reported distinction, explaining whether a person likes to plan and structure his/her learning material in a creative way (Legislative), prefers material to be pre-organized and in a clearly structured order which he/she needs to follow (Executive) or likes to judge about arguments and weigh different opinions (Judicial). In their work, Sternberg and Zhang (2005) propose different instructional methods for taking into account the individual characteristics of learners in school or other learning facilities, which have been partly tested empirically with promising results (e.g., Chen *et al.*, 2011): there seem to be differences in learning experience, evaluation and result if changing learning environments according to learners' thinking styles. So far, this has not been tested with concrete individuated learning instructions.

While not concentrating on the direct influence of personality on learning outcomes in a learning setting, which could not be related primarily enough for having a direct effect, the influence of argumentation scripts on learning outcomes adapted by personality offers a more connected way to shed light on how to foster argumentation effectively and individually. By using personality traits according to thinking styles, we propose to find out the preferred approach of SNS users to learning material. Then, by adjusting the right script to their respective style, we want to generate an adaptive support for argumentation in the informal SNS environment. The script serves to subtly remind users to apply their personal approach, without trying to overwrite it with too many or in this context hardly usable information about good argumentation.

5. Enhancing debate style and learning in an informal setting: argumentation apps

To enhance online debate quality, we argue for using apps directly built within the SNS, here Facebook. This seems to be a promising way to directly address users of this social medium. Such an app addresses users who are interested in arguing on Facebook with their friends or acquaintances about different news items. The app links users' timeline to online news articles for them to comment, share with friends and start a debate

about that topic of their interest in dedicated groups. While being able to comment on any article and topic, we offer users individually adapted scripts according to their personality, constantly reminding them that what they write is a complex opinion of theirs and which therefore should be formulated with care and elaboration. The scripts should hereby adapt to the thinking style of the user, reinforcing awareness and preference of their respective approach. We aim to foster awareness of argumentation in that publicly sharing one's opinion with others is an act which should be considered thoroughly, that representing one's opinion is a challenging task and different from quick shout-outs and assimilation of others' opinions by quickly 'liking' it.

Following the work of Sternberg, who originated the Theory of Mental Self-Government (Sternberg, 1988), the used scripts were derived from his and Zhang's (2005) proposed instructions for the three (Executive, Judicial and Legislative) functions. According to the theory, persons scoring high on these traits would prefer certain instructional approaches to learning (see table 1). From these instructions, we generated short scripts which we showed to participants. In a first piloting round (N=25), we managed to get first impressions and feedback from participants to fine-tune the scripts. For instance, we followed up on participants' critique to add "Why?" and "For what purpose?" to the script for Executive style, which initially was "Explain the content by answering the following questions: Who? When? What? How?" We also added one more sentence to concretize and streamline the instruction in comparison to the other prompts. We changed all scripts according to the first feedback in this manner, making them more and more comparable to one another in terms of length and size, reading complexity, and task difficulty, while retaining their characteristic of the respective thinking style (see table 1 for all final scripts in the language of the experiment, German, translated into English and also the original instructions proposed by Sternberg & Zhang, 2005).

In a second round (N=195), we tested the modified scripts on the acceptance and rating of participants depending on thinking style characteristic. For being able to calculate differences between participants' thinking styles, we used a shortened German version of the *Thinking Style Inventory* (TSI, Berding *et al.*, 2016), concentrating only on the scales of the three functions we were interested in. After that, the rating and evaluation of the scripts took part. Participants first were able to choose their favorite script. After that, they got all scripts in random order to be evaluated with the same nine questions on a five-point-Likert-scale each. We calculated correlations on the result of the TSI and the evaluation of the script and found significant results: all our expected directed hypotheses were supported by the data as there was a significant positive correlation between result on the Executive scale in the TSI and the evaluation of the Executive script ($r = 0.213$, $n = 195$, $p = 0.003$), as well as the same pattern for Judicial ($r = 0.270$, $n = 195$, $p = 0.000$) and Legislative ($r = 0.187$, $n = 195$, $p = 0.009$) scale result and script rating.

There were no other significant results different from our expected directions of correlations. These results therefore indicate that our derived scripts really seem to fit the preferences of the respective thinking style traits as users high in the fitting trait significantly tend to rate the fitting script higher than other scripts.

Table 1. Original instructions and derived, final scripts

TSI function	***Instructions after Sternberg & Zhang (2005)***	***Script derived and used here (German original and translated into English)***
Executive	*Who said? Summarize…Who did? When did? What did? How did? Repeat back… Describe…*	*Beschreiben Sie die Informationen durch Beantwortung folgender Fragen: Wer? Wann? Was? Wie? Wozu? Beschreiben Sie die wichtigsten Fakten.* *(Explain the content by answering the following questions: Who? When? What? How? Why? Explain most important facts.)*
Judicial	*Compare and contrast… Analyze… Evaluate… In your judgment… Why did? What caused? What is assumed by? Critique…*	*Analysieren, hinterfragen und bewerten Sie die Informationen! Was ist Ihre Sichtweise und welche Argumente sprechen dafür, welche dagegen?* *(Analyze, question and evaluate the content! What is your evaluation and what are arguments for and against that viewpoint?)*
Legislative	*Create… Invent… If you were? Imagine… Design… How would? Suppose… Ideally?*	*Suchen und beschreiben Sie die Informationen, die Sie für wichtig halten! Was fällt Ihnen spontan über diese Informationen hinaus zu dem Thema ein?* *(Find and explain the information you think is important. What else about that topic spontaneously comes to your mind?)*

Taking these results and going one step further, we want to use the scripts for launching the app directly in Facebook for offering a possibility to users for employing the scripts and enhancing their arguments when posting their opinion. We plan to gather data in an experimental lab study approach as well as in a quasi-experimental longitudinal field approach. Thus, we can directly measure what kind of arguments (high or low in

quality, rational or emotional) and lines of reasoning are built by the users when supported with a script aligned with their personality versus a script complementary to their respective style. First time users will fill out the short TSI questionnaire. Building on our results so far, we expect that personalized-aligned scripts have a greater effect on argument quality and deep elaboration than random or complementary scripts. This way, we hope to enhance deliberation of information on Facebook and reduce the influence of possibly manipulating content, realizing a critical and deliberate attitude in users. By thinking deeper and more elaborate about their own opinion and recognizing the meaning of communicating one's opinion online, we hope to reduce the echo chamber effect and open individuals for more diverse viewpoints and ideas.

Figure 1. Example of script for Executive types used in pilot study



6. Résumé and discussion

In this article, we outlined possible problems that might occur with discussion quality and habits in online social media sites. We outlined that (psychological) phenomena like groupthink, confirmation bias, cognitive dissonance and missing argumentational skills might lead to an uncritical reception of online news articles shared on SNS like Facebook. The result of these and other processes taking place online might lead to a so-called echo chamber effect, reducing the width and depth of knowledge and critical deliberation of information. We argued that CSCL approaches might have a chance to develop and ameliorate argumentational skills and therefore individual and group deliberation over time for creating an atmosphere where knowledge is more widely shared and critically discussed. Nevertheless, when using CSCL tools like scripts there might be problems concerning the uptake of proposed argumentation strategies, because users do not see Facebook as a learning, but rather as an informal social platform. At the same time, users' individual personality influences how they approach cognitive tasks, such as problem solving, learning, and argumentation. We therefore argued to adapt the scripts, turning them into subtle reminders of deliberation, automatically tailored to users' individual preference for

thinking. Thus, we aim to enhance the deliberation taking place online in SNS by giving users the possibility to reflect on their posts and opinion, helping them to become aware of their own viewpoint or the information quality of their source. For this, we design apps built into Facebook, where interested users may see personalized script messages whenever they want to post a comment to a news article. We do not think that this can put an end to the delusion and manipulation being part of everyday online news and information interaction with personalized news and advertisement, fake news spreading and its abatement, but it can be seen as a first step for trying to make users again more deliberate and critical consumers and also creators of information and the constant (re)building of the world we do live in and represent online. By this, there might be a bigger chance for them to critically analyze pieces of information, being able to dismiss really futile or incorrect information—fake news—or reviewing more than only one opinion. Using one of the principal platforms where the delusion starts it could pose a good starting point to directly engage where problems may begin.

This approach may be conducive to prepare Internet users for echo chamber effects and attempts to manipulate their opinion for commercial or political reasons. With social media being a public space for debate, which is being manipulated, deliberate argumentation and democratic processes are in peril. Misinformation and bias can violate the freedom to deliberate and disseminate accurate information. While attempts to restrict information flow may be in conflict with the very idea of deliberate and free argumentation, educating users to construct, share, and evaluate arguments may be a more feasible, albeit equally difficult enterprise.

References

Andriessen, J., Baker, M., & Suthers, D. (eds.) (2013), *Arguing to Learn: Confronting Cognitions in Computer-Supported Collaborative Learning Environments*, (Vol. 1), Dordrecht: Springer Science & Business Media.

Asterhan, C.S., & Schwarz, B.B (2007), "The Effects of Monological and Dialogical Argumentation on Concept Learning in Evolutionary Theory", in *Journal of Educational Psychology*, vol. 99, n. 3, pp. 626-639.

Bachrach, Y., Kosinski, M., Graepel, T., Kohli, P., & Stillwell, D. (2012), "Personality and Patterns of Facebook Usage", in *Proceedings of the 4th Annual ACM Web Science Conference*, Evanston, Illinois: ACM, pp. 24-32.

Baker, M. (2003), "Computer-Mediated Argumentative Interactions for the Co-Elaboration of Scientific Notions", in J. Andriessen, M. Baker, D. Suthers (eds.), *Arguing to Learn: Confronting Cognitions in Computer-Supported Collaborative Learning Enviroinments*, Dordrecht: Springer Netherlands, pp. 47-78.

Id. (2009), "Argumentative Interactions and the Social Construction of Knowledge", in N.M. Mirza & A.-N Perret-Clermont (eds.), *Argumentation and Ed-*

ucation. Theoretical Foundations and Practices, Dordrecht: Springer Netherlands, pp. 127-144.

Baker, M., & Lund, K. (1997), "Promoting Reflective Interactions in a CSCL Environment", in *Journal of computer assisted learning*, vol. 13, n. 3, pp. 175-193.

Bakshy, E. (2012), *The 2012 Election Day through the Facebook Lens*, 16 November, https://www.facebook.com/notes/facebook-data-science/the-2012-election-day-through-the-facebook-lens/10151181043778859, accessed December 02, 2016.

Barbaro, M. (2015), "Pithy, Mean and Powerful: How Donald Trump Mastered Twitter for 2016", in *The New York Times*, 5 October, http://www.nytimes.com/2015/10/06/us/politics/donald-trump-twitter-use-campaign-2016.html, accessed December 02, 2016.

Belland, B.R., Glazewski, K.D., & Richardson, J.C. (2008), "A Scaffolding Framework to Support the Construction of Evidence-Based Arguments among Middle School Students", in *Educational Technology Research and Development*, vol. 56, n. 4, pp. 401-422.

Berding, F., Masemann, M., Rebmann, K., & Paechter, M. (2016), "Perspectives on the Validity of the Thinking Styles Inventories", in *World Journal of Education*, vol. 6, n. 6, pp. 69-82.

Blickle, G. (1996), "Personality Traits, Learning Strategies, and Performance", in *European Journal of Personality*, vol. 10, n. 5, pp. 337-352.

Chen, N.S., Wei, C.W., & Liu, C.C. (2011), "Effects of Matching Teaching Strategy to Thinking Style on Learner's Quality of Reflection in an Online Learning Environment", in *Computers & Education*, vol. 56, n. 1, pp. 53-64.

Colleoni, E., Rozza, A., & Arvidsson, A. (2014), "Echo Chamber or Public Sphere? Predicting Political Orientation and Measuring Political Homophily in Twitter Using Big Data", in *Journal of Communication*, vol. 64, n. 2, pp. 317-332.

Confessore, N., & Yourish, K. (2016), "$2 Billion Worth of Free Media for Donald Trump", in *The New York Times*, 15 March, http://www.nytimes.com/2016/03/16/upshot/measuring-donald-trumps-mammoth-advantage-in-free-media.html, accessed December 02, 2016.

Costanza-Chock, S. (2008), "The Immigrant Rights Movement on the Net: Between 'Web 2.0' and Comunicación Popular", in *American Quarterly*, vol. 60, n. 3, pp. 851-864.

Ellison, N.B., Steinfield, C., & Lampe, C. (2011), "Connection Strategies: Social Capital Implications of Facebook-Enabled Communication Practices", in *New Media & Society*, vol. 13, n. 6, pp. 873-892.

Erduran, S., & Jiménez-Aleixandre, M.P. (eds.) (2008), *Argumentation in Science Education: Perspectives from Classroom-Based Research*, Netherlands: Springer.

Festinger, L. (1962), *A Theory of Cognitive Dissonance*, (Vol. 2), Palo Alto, CA: Stanford University Press.

Fischer, F., Kollar, I., Stegmann, K., & Wecker, C. (2013), "Toward a Script Theory of Guidance in Computer-Supported Collaborative Learning", in *Educational psychologist*, vol. 48, n. 1, pp. 56-66.

Furnham, A., Moutafi, J., & Crump, J. (2003), "The Relationship between the Revised NEO-Personality Inventory and the Myers-Briggs Type Indicator", in *Social Behavior and Personality: an International Journal*, vol. 31, n. 6, pp. 577-584.

Garcia-Mila, M., Gilbert, S., Erduran, S., & Felton, M. (2013), "The Effect of Argumentative Task Goal on the Quality of Argumentative Discourse", in *Science Education*, vol. 97, n. 4, pp. 497-523.

Goldberg, L.R. (1990), "An Alternative 'Description of Personality': the Big-Five Factor Structure", in *Journal of Personality and Social Psychology*, vol. 59, n. 6, 1216-1229.

Grassegger, H., & Krogerus, M. (2016), "Ich habe nur gezeigt, dass es die Bombe gibt", in *Das Magazin*, 3 December, https://www.dasmagazin.ch/2016/12/03/ich-habe-nur-gezeigt-dass-es-die-bombe-gibt/, accessed December 02, 2016.

Janis, I.L. (1982), *Groupthink: Psychological Studies of Policy Decisions and Fiascoes*, (Vol. 349), Boston: Houghton Mifflin.

Kim, K.S., Sin, S.C. J., & Tsai, T.I. (2014), "Individual Differences in Social Media Use for Information Seeking", in *The Journal of Academic Librarianship*, vol. 40, n. 2, pp. 171-178.

Komarraju, M., & Karau, S.J. (2005), "The Relationship between the Big Five Personality Traits and Academic Motivation", in *Personality and Individual Differences*, vol. 39, n. 3, pp. 557-567.

Kosinski, M., Stillwell, D., & Graepel, T. (2013), "Private Traits and Attributes are Predictable from Digital Records of Human Behavior", in *Proceedings of the National Academy of Sciences*, vol. 110, n. 15, pp. 5802-5805.

Kosinski, M., Bachrach, Y., Kohli, P., Stillwell, D., & Graepel, T. (2014), "Manifestations of User Personality in Website Choice and Behaviour on Online Social Networks", in *Machine Learning*, vol. 95, n. 3, pp. 357-380.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998), "Internet Paradox: A Social Technology that Reduces Social Involvement and Psychological Well-Being?", in *American Psychologist*, vol. 53, n. 9, pp. 1017-1031.

Kuhn, D. (1991), *The Skills of Argument*, Cambridge: University Press.

Kushin, M.J., & Kitchener, K. (2009), "Getting Political on Social Network Sites: Exploring Online Political Discourse on Facebook", in *First Monday*, vol. 14, n. 11.

Marchi, R. (2012), "With Facebook, Blogs, and fake News, Teens Reject Journalistic 'Objectivity'", in *Journal of Communication Inquiry*, vol. 36, n. 3, pp. 246-262.

Mullen, B., Brown, R., & Smith, C. (1992), "Ingroup Bias as a Function of Salience, Relevance, and Status: An integration", in *European Journal of Social Psychology*, vol. 22, n. 2, pp. 103-122.

Munger, K. (2016), "Tweetment Effects on the Tweeted: Experimentally Reducing Racist Harassment", in *Political Behavior*, doi:10.1007/s11109-016-9373-5.

Noroozi, O., Weinberger, A., Biemans, H.J., Mulder, M., & Chizari, M. (2013), "Facilitating Argumentative Knowledge Construction through a Transactive

Discussion Script in CSCL", in *Computers & Education*, vol. 61, n. 2, pp. 59-76.

Osborne, J., Erduran, S., & Simon, S. (2004), *Ideas, Evidence and Argument in Science*, London: Nuffield Foundation.

Putnam, R.D. (1995), "Bowling alone: America's declining social capital", in *Journal of democracy*, vol. 6, n. 1, pp. 65-78.

Rafaeli, S., & Sudweeks, F. (1997), "Networked Interactivity", in *Journal of Computer-Mediated Communication*, vol. 2, n. 4, doi: 10.1111/j.1083-6101.1997.tb00201.x

Rainie, L., Smith, A., Schlozman, K.L., Brady, H., & Verba, S. (2012), "Social Media and Political Engagement", Washington: Pew Internet & American Life Project, http://www.pewinternet.org/files/old-media/Files/Reports/2012/PIP_SocialMediaAndPoliticalEngagement_PDF.pdf, accessed December 02, 2016.

Rosen, D., Barnett, G. A., & Kim, J. H. (2011), "Social Networks and Online Environments: when Science and Practice Co-Evolve", in *Social Network Analysis and Mining*, vol. 1, n. 1, pp. 27-42.

Scheuer, O., Loll, F., Pinkwart, N., & McLaren, B.M. (2010), "Computer-Supported Argumentation: A review of the State of the Art", in *International Journal of Computer-Supported Collaborative Learning*, vol. 5, n. 1, pp. 43-102.

Schwind, C., Buder, J., Cress, U., & Hesse, F.W. (2012), "Preference-Inconsistent Recommendations: An Effective Approach for Reducing Confirmation Bias and Stimulating Divergent Thinking?", in *Computers & Education*, vol. 58, n. 2, pp. 787-796.

Shah, D., Rojas, H., & Cho, J. (2009), "On Understanding and Misunderstanding Communication Effects", in J. Bryant and B. Oliver (eds.), *Media Effects-Advances in Theory and Research*, New York-London: Routledge, pp. 207-226.

Shapiro, R.B., & Ossorio, P.N. (2013), "Regulation of Online Social Network Studies", in *Science*, vol. 339, n. 6116, pp.144-145.

Stegmann, K., Wecker, C., Weinberger, A., & Fischer, F. (2012), "Collaborative Argumentation and Cognitive Elaboration in a Computer-Supported Collaborative Learning Environment", in *Instructional Science*, vol. 40, n. 2, pp. 297-323.

Stein, J. (2016), "Study: Hillary Clinton, not Donald Trump, Gets the Most Negative Media Coverage", in *Vox*, 20 May, http://www.vox.com/2016/4/15/11410160/hillary-clinton-media-bernie-sanders, accessed December 02, 2016.

Sternberg, R.J. (1988), "Mental Self-Government: A Theory of Intellectual Styles and their Development", in *Human Development*, vol. 31, n. 4, pp. 197-224.

Sternberg, R.J., & Zhang, L.F. (2005), "Styles of Thinking as a Basis of Differentiated Instruction", in *Theory into Practice*, vol. 44, n. 3, pp. 245-253.

Stroud, N.J. (2010), "Polarization and Partisan Selective Exposure", in *Journal of Communication*, vol. 60, n. 3, pp. 556-576.

Tsovaltzi, D., Judele, R., Puhl, T., & Weinberger, A. (2015), "Scripts, Individual Preparation and Group Awareness Support in the Service of Learning in Facebook: How does CSCL Compare to Social Networking Sites?", in *Computers in Human Behavior*, vol. 53, pp. 577-592.

van Boxtel, C., van der Linden, J., & Kanselaar, G. (2000), "Collaborative Learning Tasks and the Elaboration of Conceptual Knowledge", in *Learning and Instruction*, vol. 10, n. 4, pp. 311-330.

van Dijk, A.M., Gijlers, H., & Weinberger, A. (2014), "Scripted Collaborative Drawing in Elementary Science Education", in *Instructional Science*, vol. 42, n. 3, pp. 353-372.

Wang, M., & Hsu, B. (2012), "A Study to Explore the Team Virtualization Level and Team Effectiveness from the Team Personality Composition", in *Journal of The Knowledge Economy*, vol. 3, n. 2, pp. 199-216.

Wason, P.C. and Johnson-Laird, P.N. (1972), *Psychology of Reasoning: Structure and Content*, Cambridge, MA: Harvard University Press.

Weinberger, A. (2011), "Principles of Transactive Computer-Supported Collaboration Scripts", in *Nordic Journal of Digital Literacy*, vol. 6, n. 3, pp. 189-202.

Weinberger, A., & Fischer, F. (2006), "A Framework to Analyse Argumentative Knowledge Construction in Computer-Supported Collaborative Learning", in *Computers & Education*, vol. 46, pp. 71-95.

Weinberger, A., Stegmann, K., & Fischer, F. (2007), "Knowledge Convergence in Collaborative Learning: Concepts and Assessment", in *Learning and Instruction*, vol. 17, n. 4, pp. 416-426.

Id. (2010), "Learning to Argue Online: Scripted Groups Surpass Individuals (Unscripted Groups Do Not)", in *Computers in Human Behavior*, vol. 26, n. 4, pp. 506-515.

Weinberger, A., Reiserer, M., Ertl, B., Fischer, F., & Mandl, H. (2005), "Facilitating Collaborative Knowledge Construction in Computer-Mediated Learning Environments with Cooperation Scripts", in R. Bromme, F.W. Hesse, & H. Spada (eds.), *Barriers and Biases in Computer-Mediated Knowledge Communication and How they May Be Overcome,* Dodrecht, NL: Kluver Academic Publisher, pp. 15-37.

Weinberger, A., Stegmann, K., Fischer, F., & Mandl, H. (2007), "Scripting Argumentative Knowledge Construction in Computer-Supported Learning Environments", in F. Fischer, H. Mandl, J. Haake, & I. Kollar (eds.), *Scripting Computer-Supported Communication Of Knowledge—Cognitive, Computational and Educational Perspectives*, New York: Springer, pp. 191-211.

Youyou, W., Kosinski, M., & Stillwell, D. (2015), "Computer-Based Personality Judgments Are More Accurate than those Made by Humans", in *Proceedings of the National Academy of Sciences*, vol.112, n. 4, pp. 1036-1040.

Zukin, C., Keeter, S., Andolina, M., Jenkins, K., & Carpini, M.X.D. (2006), *A New Engagement?: Political Participation, Civic Life, and the Changing American Citizen*, Oxford: Oxford University Press.

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