# Journal of

Media

Psychology

Theories, Methods, and Applications

hogrefe

Using movies to help learn about mental illness

"I have been a fan of *Movies and Mental Illness* from the first edition."

Steven Pritzker, PhD, psychology professor (Saybrook University) and former Hollywood script writer
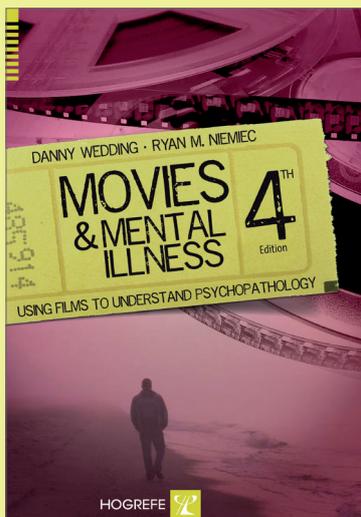
Danny Wedding / Ryan M. Niemiec

Movies and Mental Illness
Using Films to Understand Psychopathology

4th edition 2014, xviii + 456 pp.
US $59.00 / € 42.95
ISBN 978-0-88937-461-4
Also available as eBook

Films can be a powerful aid to learning about mental illness and psychopathology – for students of psychology, psychiatry, social work, medicine, nursing, counselling, literature or media studies, and for anyone interested in mental health. Movies and Mental Illness, written by experienced clinicians and teachers who are themselves movie aficionados, has established a great reputation as a uniquely enjoyable and highly memorable text for learning about psychopathology. The new edition has been fully updated to include DSM-5 and ICD-10 diagnoses.

The core clinical chapters each use a fabricated case history and Mini-Mental State Examination along with synopses and discussions about specific movies to explain, teach, and encourage discussion about all the most important mental health disorders.

Each chapter also includes: Critical Thinking Questions; "Authors' Picks" (Top 10 Films); What To Read if You Only Have Time to Read One Book or Article; and Topics for Group Discussions.

www.hogrefe.com

hogrefe

Journal of

Media
Psychology

Theories, Methods, and Applications

Volume 34/Number 1/2022

hogrefe

Contents

Editorial

Expanded Coverage and Expanding Our Editorial Team

Nick Bowman

College of Media & Communication, Texas Tech University, Lubbock, TX, USA

As *Journal of Media Psychology* enters its 34th volume, we are pleased to see the journal continue to grow to meet the evolving, expanding, and increasingly interdisciplinary field of media psychology.

Most exciting for *JMP* is that we will be expanding the number of total issues published with each volume – expanding from four annual issues to six annual issues. This growth has been made possible by an increased impact factor (as of 2020, 1.634; 5-year impact factor of 3.043) and a marked increase in submissions to the journal, which have pushed our rejection rate upwards of 90%. This growth has also been represented by an increase in submissions from around the globe and beyond North American and Western European contexts, which has been an ongoing consideration for the journal (and in the social sciences broadly; Kupferschmidt, 2019). Our hope is that by expanding to a bi-monthly rather than a quarterly publication cycle, we can both make room for the expansion of media psychology as a field while also publishing accepted research much more quickly. We have also recently expanded our editorial board to more than 80 scholars and will continue expanding this body, so that we have a reserve of dedicated scholars able to provide expert feedback on submitted scholarship.

As we enter 2022, we also have a "changing of the guard" with our editorial team, as we will say goodbye to Dr. Christoph Klimmt, who was the Editor-in-Chief for volumes 30–32. Christoph was a driving force in the journal's growth over the last few years, helping lead efforts to establish our online presence and encourage submissions from a broader and global community. Most recently, Christoph organized our efforts to encourage a deeper elaboration on the trajectory of theory in media psychology research – the first efforts of which were recently published (Klimmt & Bowman, 2021) and we're eager to publish the other essays in that collection in the coming year. The journal thrived under Christoph's leadership, and I have been able to learn quite a bit from him over the last year of our overlapping editorial tasks.

With Christoph's departure, we are also pleased to bring on-board a new member to our Associate Editors team in Dr. H. H. J. "Enny" Das of Radboud University in The Netherlands. At Radboud U, Enny is the chair of communication and persuasion and bring an extensive background in the study of persuasion and health communication. She is a highly cited scholar with nearly 4,000 individual citations as of this writing (according to Google Scholar) and more than 50 published manuscripts with at least 10 citations. More importantly, she is an incredibly thoughtful and thorough peer reviewer who has made recent contributions to *JMP* as an author as well (with an upcoming manuscript focused on the narrative processing of tragic entertainment). Already as 2021 comes to a close, Enny has taken to her associate editorship enthusiastically, and we are grateful to have her voice among our editors.

As the journal expands in size and scope, I want to renew our calls for increased transparency. The last two years have severely challenged many of the structures of traditional academic publishing, and one thing we have learned is that our authors and our reviewers are under immense personal and professional strain. Through our social media (Facebook: https://www.facebook.com/JournalOfMediaPsychology and Twitter @JMP_Hogrefe) we provide bimonthly updates about our review times and acceptance rates. We've also worked with our editors (and our editorial assistants) to stay in constant contact with our authors, and we encourage you to reach out to use with any questions, comments, or concerns. We collectively own the future of media psychology and likewise, the trajectory of *JMP*.

References

Klimmt, C., & Bowman, N. D. (2021). Inspiring, regulating, multitasking, modeling, and shifting: Moving media psychology forward through theoretical innovation. *Journal of Media Psychology, 33*(4), 167–168. https://doi.org/10.1027/1864-1105/a000324

Kupferschmidt, K. (2019, July 11). Is the Western mind too WEIRD to study? *Science*. https://www.science.org/content/article/western-mind-too-weird-study

Nick D. Bowman
College of Media & Communication
Texas Tech University
Box 43082
Lubbock, TX 79409
USA
nick.bowman@ttu.edu

Nick Bowman (PhD, Michigan State University) is Associate Professor of Journalism and Creative Media Industries at Texas Tech University, USA. His research examines the cognitive, emotional, social, and physical demands of interactive media. He was recently named Fulbright Wu Jing-Jyi Arts and Culture Fellow at National Chengchi University in Taiwan.

Hate Speech as an Indicator for the State of the Society

Effects of Hateful User Comments on Perceived Social Dynamics

Svenja Schäfer[1], Michael Sülflow[2], and Liane Reiners[2]

[1]Department of Communication, University of Vienna, Austria
[2]Department of Communication, Johannes Gutenberg University Mainz, Germany

Abstract: Previous research indicates that user comments serve as exemplars and thus have an effect on perceived public opinion. Moreover, they also shape the attitudes of their readers. However, studies almost exclusively focus on controversial issues if they explore the consequences of user comments for attitudes and perceived public opinion. The current study wants to find out if hate speech attacking social groups due to characteristics such as religion or sexual orientation also has an effect on the way people think about these groups and how they think society perceives them. Moreover, we also investigated the effects of hate speech on prejudiced attitudes. To explore the hypotheses and research questions, we preregistered and conducted a 3 × 2 experimental study varying the amount of hate speech (none/few/many hateful comments) and the group that was attacked (Muslims/homosexuals). Results show no effects of the amount of hate speech on perceived public opinion for both groups. However, if homosexuals are attacked, hate speech negatively affects perceived social cohesion. Moreover, for both groups, we find interaction effects between preexisting attitudes and hate speech for discriminating demands. This indicates that hate speech can increase polarization in society.

Keywords: hate speech, user comments, perceived public opinion, polarization, experimental research

User comments appearing below news items have become a characteristic feature of online news. Even though only a minority of Internet users actively contribute to online discussions (Ziegele et al., 2018), the majority reads comments at least occasionally (57%; Springer et al., 2015). This makes user comments and potential effects that result from the contact with online discussions a highly relevant topic that has raised the interest of many communication scholars.

One aspect of user comments that have received much attention concerns the low quality of online discussion. Recent numbers indicate that about one-half of German Internet users have already had contact to hateful comments or hate speech online (Landesanstalt für Medien NRW, 2019). Hate speech can be defined as verbal aggression attacking groups or individuals due to belonging to social categories such as race, gender, or sexual orientation (Erjavec & Kovačič, 2012). If it comes to consequences that might result from getting in touch with these type of comments, a number of studies could show that user comments serve as exemplars (Peter et al., 2014; Zerback & Fawzi, 2016) and thus provide a baseline for inferences on public opinion (Neubaum & Krämer, 2016) as well as for the formation of attitudes (Hsueh et al., 2015). Previous studies investigating the role of user comments for perceived public opinion and attitude formation have shown these kinds of effects for controversial issues such as vaccination (Peter et al., 2014), animal testing (Lee & Jang, 2010), or nanotechnology (Hsueh et al., 2015). Thus, it remains unclear if hateful comments attacking social groups also affect perceived public opinion or attitudes toward these groups. If user comments serve as exemplars, it is plausible to assume that hateful comments also have an effect on the perception of the standing of this group in society or attitudes toward this group. Since exploring these kinds of effects of hate speech also provides important insights to understand social dynamics and the role of hateful user comments for polarizing processes, the current study wants to fill this gap in research. Thus, we experimentally explore if the share of hateful comments affects (1) the perceived share of the population and the Facebook user who hold a negative attitude against the social group that is attacked, (2) the perception of social cohesion, and (3) the tendency to hold more extreme attitudes about the social group. In sum, the study extends the understanding of possible consequences that result from hate speech in user comments.

Hate Speech in the Comment Section

Theoretically, user comments have the potential to enable a diverse audience to engage in a well-reasoned discourse through the exchange of different points of view on various issues. But not all comments contribute to such positive outcomes of a discussion. Instead, they can display for instance, "an unnecessarily disrespectful tone toward the discussion forum, its participants, or its topics" (Coe et al., 2014, p. 660), a phenomenon that is referred to as online incivility. This lack of respect can target individuals and violate politeness norms (personal-level incivility) or disrespect democratic, deliberative norms (public-level incivility) (Muddiman, 2017). When it comes to hate speech, there is still no uniform definition even though the term has received a lot of attention both in the scientific context and in public debates. We refer to hate speech as any form of abusive, intimidating, harassing, or hateful expression in online discussions that is directed against people because they are part of a social group (Erjavec & Kovačič, 2012). More precisely, there are four characteristics that distinguish hate speech from other negative forms of online discussions such as incivility, impoliteness, or cyber mobbing. (1) The most common feature in hate speech definitions is the reference to a target (Bilewicz & Soral, 2020; Wilhelm et al., 2020). Hate speech is a discriminating expression directed to a person as a part of a social group or the social group as a whole. In general, any human characteristic can serve as a trigger for this discrimination, but categories that are most commonly referred to in hateful comments are ethnicity, nationality, gender, religion, sexual orientation, or disabilities (Kulkarni et al., 2018; Silva et al., 2016). Other characteristics are traits like political conviction (Erjavec & Kovačič, 2012) or professions (e.g., journalists; Obermaier et al., 2018). Also, (2) hate speech is directed to an individual or a social group that the attacker does not personally know, which would be the case in cyber mobbing (Obermaier et al., 2018) or other forms of online harassment. Moreover, (3) the discriminating expressions serve the purpose to harm those attacked or subordinate the members of the social group that is discriminated against (Guo & Johnson, 2020). Due to this characteristic, it can be considered a specific type of harmful speech (Faris et al., 2016). Further, (4) hate speech can differ with regard to the intensity of the attack. Hate speech comprises all kinds of discriminating expressions, ranging from the repetition of stereotypes to severe forms of name-calling or encouragement of physical violence. This point is especially important with regard to legal regulations which have to determine if expressions of hate speech are still covered by the freedom of expression or have to be deleted or even prosecuted (Sellars, 2016).

Findings for Germany indicate that about 75% of the Internet users have already been confronted with hate in online discussions (Landesanstalt für Medien NRW, 2019) which outlines the importance to investigate the potential effects of hate speech. If hate dominates online discussions this might have negative consequences for dynamics in a society. This assumption is outlined in more detail in the following section.

User Comments – Its Effects on the Perception of Social Dynamics

Exemplification theory mainly focuses on the presence and effects of so-called exemplars in media coverage (Zillmann & Brosius, 2000). Exemplars thereby refer to single persons or events which are typical cases for the issue or the social group at hand. For traditional news media, exemplars have been shown to be highly relevant and even more important than base-rate information for multiple judgments, such as reality perceptions (Zerback & Peter, 2018) and personal assessments (Brosius, 1999). A recent line of research has shown that also user comments can serve as exemplars. As pointed out by Friemel and Dötsch (2015), commenters are considered to be more or less representative of society. This makes them a potential anchor for generalizations and thus reality perceptions such as frequency distributions or dominating attitudes within the society. Lee and Jang (2010) could show that if users get confronted with user comments that are congruent with their own opinion they assume that the society, in general, is also more congenial compared to users who saw comments incongruent with their opinion. Another study by Neubaum and Krämer (2016) shows that the valence of user comments has an effect on the perception of how members on Facebook and society, in general, think about controversial issues. If user comments conveyed a negative slant toward assisted suicide or adoption rights for same-sex couples, participants also assumed that the share of people on Facebook and in the society holding negative attitudes are higher. Thus, the one-time confrontation with an online discussion already seems to have an effect on people's public opinion perception. In this context, Zerback and Fawzi (2016) extend previous studies with the finding that the amount of comments expressing an opinion is of importance. They report no effects if participants saw only two exemplars expressing an opinion about the topic of eviction of violent immigrants. However, if they were exposed to 10 comments, the opinion of the commenters paralleled with the perceived opinion of Internet users and of the population, even though effects for the latter did not reach significance.

All these studies have in common that they focus on the effects of user comments and perceived public opinion for controversial issues. Thus, even though hateful comments

attacking social groups are a prevalent part of online discussions, it needs to be clarified if discriminating comments also translate into the perception that many people negatively think of these groups in reality.

Based on the assumption that user comments serve as exemplars and in line with findings that have been outlined in this section, we assume:

Hypothesis 1 (H1): An online discussion containing hate speech has a positive effect on the estimated share of (a) Facebook users and (b) the society holding a negative attitude toward the social group that is attacked in the comments compared to an online discussion without hate speech.

Moreover, since it has been shown that the number of comments is also of importance for generalizing from user comments to Facebook members and the society in general (Zerback & Fawzi, 2016), we further hypothesize:

Hypothesis 2 (H2): The more hate speech an online discussion contains, the higher the estimated share of (a) Facebook users and (b) the society holding a negative attitude toward the social group that is attacked in the comments.

The experience that social groups are attacked in comments might not just have an effect on the frequency distribution of negative attitudes toward this group but also potentially influence the perception of social cohesion in a society. Social cohesion describes a societal state that is characterized by integrating individuals and social groups into a larger collective unit that shares a more or less common value system (Yamamoto, 2011). The concept puts into focus "diverse aspects of the dynamics of social relations, such as social exclusion, participation and belonging" (Novy et al., 2012, p. 1873). As proposed by Friedkin (2004), social cohesion consists of two indicators on the individual-level: (1) individuals' membership attitudes and (2) individuals' membership behavior. Parts of membership attitudes are, for example, the level of identification with the collective unit, the desire to be a part of the unit, but also attitudes about other members of the group. Behavioral indicators concern among others decisions to keep, weaken or strengthen the membership in the collective unit. Social cohesion can be considered as a continuum with cohesion at one end of the scale and social dissolution on the other. In a state of dissolution, the level of inclusiveness, but also norms like trust or behavioral indicators such as the willingness to help others are on a low level (Lockwood, 1999).

If people get confronted with hate speech attacking social groups, this is likely to affect individuals' perception of social cohesion. Hate speech makes it visible that the society is fragmented and shows a low level of inclusion since members of different social groups isolate themselves and

even oppose each other. This way, hate speech might contribute to the perception that social cohesion in society is low. Thus, it can be assumed:

Hypothesis 3 (H3): The amount of hate speech in the comment section has a negative effect on perceived social cohesion.

Attitudinal Effects of Hate Speech in the Comment Section

The confrontation with discriminating and derogatory user comments might not only have an effect on the perception of social dynamics but also on attitudes. More precisely, we want to investigate if and how hate speech affects attitude polarization, which can be defined as moves of attitudes toward more extreme positions (Lord et al., 1979). For several issues, studies on the effects of user comments confirm that the slant of comments affects people's attitude toward a given issue (Anderson et al., 2018; Sung & Lee, 2015). Concerning hate speech, findings also indicate that exposure to stereotyped content changes the way people think about the group. An experimental study by Hsueh et al. (2015) showed that prejudiced user comments containing stereotypes about Chinese students increased negative feelings toward that group. A study by Winiewsky et al. (2016) extends these findings by showing that consequences go even beyond increased stereotypes. They find that people who are exposed to hate speech (e.g., transphobic, anti-immigrant, sexist language) tended to avoid the groups attacked in their personal environment and agreed with measures restricting the legal rights of these groups or excluding them from society. These kinds of effects can be explained with two theoretical approaches. First, according to the idea of media priming, depictions of stereotypes in the media become incorporated into the thinking of those being exposed to this kind of content and subsequently affect stereotyped thinking, judging, and behavior (Ramasubramanian, 2007). Thereby, both implicit stereotypes (i.e., stereotypes which are automatically activated) and explicit stereotypes (i.e., overtly expressed negative attitudes) can increase (Arendt, 2013). Another explanation for the effects of hate speech on polarized attitudes can be found in processes described in mainstreaming and desensitization. Mainstreaming can be defined as the process of shifting the public discourse to a more radical stance (Kallis, 2013). What has once been considered as completely inappropriate and unspeakable becomes normalized and part of the spectrum of diverse opinions (Cammaerts, 2018). This process can also be fueled by comment sections that provide a platform for extreme and anti-democratic positions and this way normalize what have once been repulsive ideas in front of

a large audience. This is not only dangerous because of a change of the public discourse but also because it can have an effect on attitudes within society. Soral et al. (2018) find that repeated contact to hate speech leads to desensitization which also affects cognitive and affective reactions to discriminating content. In a series of studies, they could show that the repeated exposure to hate speech decreased hate speech sensitivity and increased prejudice against the group that was attacked. Hate speech seems to shift the boundaries of acceptable attitudes and thus has the potential to make people more open to more radical standpoints. While Soral et al. (2018) found direct effects on (stereotyped) attitudes, other studies confirm the importance of preexisting attitudes (Sung & Lee, 2015). Anderson et al. (2018) explored the effects of uncivil comments on the risk perception of nanotechnology. The effect of incivility depended on the preexisting attitudes toward nanotechnology. Those supporting nanotechnology showed fewer risk perceptions while those with lower support indicated higher levels of risk perception when being confronted with higher levels of incivility. Concerning effects for user comments for democratic processes, the authors conclude:

> "Much in the same way that watching uncivil politicians argue on television causes polarization among individuals, impolite and incensed blog comments can polarize online users based on value predispositions utilized as heuristics when processing the blog's information." (p. 383)

In sum, it can be concluded that user comments have the potential to affect attitudes. This has been shown for various controversial topics, but also for prejudice against social groups in the comment section. Moreover, preexisting attitudes might be of importance since they have been shown to cause polarizing dynamics. Applied to the context of hate speech this would mean that those with a negative attitude toward the group that is attacked are more likely to assimilate with the position of the discriminating commenters while those having a positive attitude are more likely to reject this position. In short, we assume:

Hypothesis 4 (H4): The amount of hate speech in the comment section has a positive effect on polarized attitudes toward the group that is attacked.

Method

Procedure and Participants

To test the hypotheses, we conducted an online survey with a 3 × 2 between-subject experimental design. Thereby, we varied both the amount of hate speech in the user comment section (no hate speech, few and many hateful comments) as well as the group that was attacked (Muslims, homosexuals). The comments that were part of the stimulus were pretested in advance of the study. Also, before conducting the experiment, we preregistered the idea of the study, the hypotheses, the stimulus material, the number of necessary participants (based on a power analysis), and the measures that are used for the statistical analysis on osf.org (link to the preregistration: https://osf.io/f9xrh?view_only= 9485d27bf787408fa4ea232ce56e5010). Concerning the power analysis, we used the program G*Power version 3.1 (Faul et al., 2007; Test family: F-test; statistical test: analysis of variance (ANOVA) fixed effects, omnibus, one-way, effect size: 0.15, α-error: 0.05, power: 0.95, number of groups six) to find out that we need 888 participants for our hypotheses testing. We assumed small effect sizes since our dependent variables (perceived public opinion, perceived social cohesion, attitude polarization) a rather stable constructs and should therefore not be tremendously affected by a one-time confrontation with eight comments.

The data collection for this study took place between October 21 and November 11, 2019. In sum, 920 Facebook users took part in our online-experiment ($M_{age} = 41.13$ years, $SD = 14.57$; 56% female, 82% at least high school degree) and completed the whole questionnaire. The participants were recruited through an online-access-panel of Internet users from Germany, Switzerland, and Austria (SoSci; Leiner, 2016).

Stimulus

For the experiment, we created six different Facebook newsfeeds including a post and comments underneath the post. We chose Muslims and homosexuals as the groups that were attacked in the comments for two reasons. First, concerning prejudiced attitudes findings indicate that about 25% of the German population hold negative attitudes against Muslims and 12% hold negative attitudes against homosexuals (Küpper et al., 2017). Second, Internet users frequently encounter hateful comments against these groups. According to a study by Geschke et al. (2019), 77% of German Internet users have at least occasionally encountered aggressive or discriminating statements against Muslims and 62% against homosexuals. This emphasizes the importance to investigate the effects of hateful comments against these groups. Thus, the news posts dealt either with statistics of people having a Muslim religious confession or with the Christopher Street Day in Germany. Below both news posts, participants saw an online discussion that consisted of eight comments and varied with regard to the amount of hate speech between the groups. The comments either contained no hate speech,

two hateful comments (and six neutral comments), or six hateful comments (and two neutral comments). These decisions can be justified as follows: We decided to show the participant eight comments since the online discussion should not be too long. A shorter online discussion makes it more likely that the participants carefully read the discussion. Also, we wanted to have a noticeable difference between the level of discrimination between the few and many hateful comments conditions. Thereby, participants should in all conditions be confronted with shares of discriminating and neutral comments which can also be found in reality under posts of mainstream news providers. That is why we decided to show participants not exclusively hate speech in the third condition since this cannot be expected under a post by Spiegel Online. In sum, the experimental conditions varied both with regard to the group that was attacked (Muslims/homosexuals) and the amount of hate speech (no/few/many hateful comments). Examples for the stimulus versions as well as a translation of all comments can be found along with other supplementary material at https://osf.io/km4eg/?view_only=886cdc075d904377aedc82f7133d18f6.

The comments used in the experiment were pretested in advance of the experiment. Fifty-two participants were asked to rate user-comments with regards to their degree of discrimination. For Muslims and homosexuals, the six user comments that were evaluated as being most discriminating were chosen for the main study (mean index for comments related to Muslims: $M = 4.62$, $SD = 0.67$; homosexuals: $M = 4.87$, $SD = 0.39$; scale: 1 = *not discriminating*, 5 = *very much discriminating*). Further, the pretest also revealed that the eight neutral comments were evaluated as being not at all discriminating ($M = 1.50$, $SD = 0.48$). Moreover, the news posts of the mock newsfeeds were also rated as not discriminating (Muslims: $M = 1.69$, $SD = 0.95$; homosexuals: $M = 1.15$, $SD = 0.46$). The hate speech comments that were used for the final experiment can be characterized by discriminating statements either against Muslims (e.g., "Islam is an inhuman cult and its followers are all fanatics") or against homosexuals (e.g., "I don't want to have anything to do with those fags. I just think it's disgusting"). Neutral comments did not include discriminating speech (e.g., "Interesting article. I liked the comparisons with previous years").

Results of the main study also revealed that our manipulation was successful. Participants perceived the comments in the "many" hateful comments condition to be more discriminating against the group that was attacked (Muslims: $M = 6.48$, $SD = 1.05$; homosexuals: $M = 6.51$, $SD = 1.21$; scale: 1 = *do not agree at all*, 7 = *fully agree*) followed by the "few" hate comments condition (Muslims: $M = 4.94$, $SD = 1.68$; homosexuals: $M = 5.17$, $SD = 1.70$) and the "no" hateful comments condition (Muslims: $M = 3.09$,

$SD = 1.95$; homosexuals: $M = 2.86$, $SD = 1.68$). An ANOVA showed that the group differences varied significantly [Muslims: $F(2, 460) = 215.943$, $p < .001$, homosexuals: $F(2, 454) = 168.901$, $p < .001$].

Measures

Before the stimulus presentation, we measured *preexisting attitudes* toward Muslims and homosexuals (negative-positive, 11-point scale slide bar). We chose this single item since we did not want to prime any stereotypes before presenting the stimulus. This might have interfered with the effects that we wanted to investigate. Also, we just wanted to ask for the overall attitude that comes to the participant's minds if they are asked to judge the groups that were attacked in the stimulus. The same measure can be found in a study by Küpper et al. (2017).

To measure *perceived public opinion*, participants should estimate the share of people on Facebook as well as in society who hold negative attitudes toward Muslims or homosexuals depending on the stimulus they were exposed to (slide bar from 0 to 100%; also in Neubaum & Krämer, 2016; Zerback & Fawzi, 2016).

For *perceived social cohesion* participants stated their agreement to three items ("Society falls apart"; "In Germany, more and more people are marginalized"; "In Germany, cohesion is in danger"; 1 = *do not agree at all*, 7 = *fully agree*) that we obtained from Zick and Küpper (2012). A mean index was calculated (α = .82).

Attitudes toward the social groups were measured by asking participants about the agreement to different demands (1 = *do not agree at all*, 7 = *fully agree*). To measure attitudes toward Muslims, we chose two items from Lee et al. (2013). These were: "Muslims should not be allowed to work at crowded places, such as airports" and "I would support political actions to prevent the building of more mosques." We further added the item "Muslims should not be allowed to wear headscarves in public institutions." To measure attitudes toward homosexuals, we used three items obtained from Seise et al. (2002): "Homosexual couples should not be allowed to adopt children"; "Homosexuals should not be allowed to get married"; "Homosexuals should not work with children and adolescents." For the analyses, these items were considered separately, as they did not show a satisfying internal consistency (Muslims: α = .65, homosexuals: α = .69).

Results

Hypotheses Testing

In H1a it was assumed that hate speech has a positive effect on the estimated share of Facebook users holding a

negative attitude toward the social group that is attacked compared to user comments without hate speech. To investigate this hypothesis, we merged the conditions containing hate speech (few and many) and compared the overall mean value for all participants who saw hate speech to the participant in the neutral condition. Thereby, we calculated a *t*-test. The results show that comments containing hate speech compared to comments containing no hate speech have no effect on the estimated share of Facebook users holding a negative attitude toward Muslims, $t(446) = .39$, $p = .70$; $M_{neutral} = 44.63\%$, $SD = 21.36$, $M_{hate} = 45.50\%$, $SD = 22.21$, or homosexuals, $t(458) = -1.01$, $p = .32$; $M_{neutral} = 39.22\%$, $SD = 18.92$, $M_{hate} = 37.40\%$, $SD = 18.21$. Thus, H1a is not supported.

In H1b it was assumed that hate speech has a positive effect on the estimated share of society holding a negative attitude toward the social group that is attacked compared to user comments without hate speech. The results show that hate speech in comments also has no effect on the estimated share of the society holding a negative attitude toward Muslims, $t(453) = -0.25$, $p = .80$; $M_{neutral} = 42.01\%$, $SD = 20.80$, $M_{hate} = 41.48\%$, $SD = 20.56$. However, hate speech affects the estimated share of the society holding a negative attitude toward homosexuals, $t(459) = -2.00$, $p = .05$. Participants that were exposed to no hate speech estimated this share slightly higher ($M = 39.25\%$, $SD = 19.40$) than participants that were exposed to hate speech in the comments ($M = 35.53\%$, $SD = 18.81$). Thus, H1b is not supported.

In H2a we assumed that the more hate speech an online discussion contains, the higher the estimated share of Facebook users holding negative attitudes toward the social groups that are attacked. However, the amount of hate speech has no effect on the estimated share of Facebook users holding a negative attitude toward Muslims, $F(2, 445) = 0.90$, $p = .41$; $M_{neutral} = 44.63\%$, $SD = 21.36$, $M_{few} = 43.91\%$, $SD = 22.41$, $M_{many} = 47.10\%$, $SD = 21.97$, or homosexuals, $F(2, 457) = .51$, $p = .60$; $M_{neutral} = 39.22\%$, $SD = 18.92$, $M_{few} = 37.29\%$, $SD = 17.69$, $M_{many} = 37.52\%$, $SD = 18.83$. Thus, H2a is not supported.

In H2b we assumed that the more hate speech an online discussion contains, the higher the estimated share of society holding negative attitudes toward the social groups that are attacked. Again, we find no effect of the amount of hate speech on the estimated share of the society holding a negative attitude toward Muslims, $F(2, 452) = 0.05$, $p = .96$; $M_{neutral} = 42.01\%$, $SD = 20.80$, $M_{few} = 41.28\%$, $SD = 21.09$, $M_{many} = 41.69\%$, $SD = 20.08$, or homosexuals, $F(2, 458) = 2.05$, $p = .13$; $M_{neutral} = 39.25\%$, $SD = 19.40$, $M_{few} = 35.87\%$, $SD = 19.31$, $M_{many} = 35.15\%$, $SD = 18.28$. Thus, H2b is not supported.

In H3 we assumed that the amount of hate speech has a negative effect on perceived social cohesion. We find that

the amount of hate speech toward Muslims has no effect, $F(2, 454) = 1.92$, $p = .15$; $M_{neutral} = 4.73$, $SD = 1.41$, $M_{few} = 4.47$, $SD = 1.41$, $M_{many} = 4.44$, $SD = 1.33$. However, the amount of hate speech toward homosexuals affects the perception of social cohesion, $F(2, 460) = 3.76$, $p = .02$, $\eta^2 = .02$. The post hoc test (Bonferroni) reveals that participants who are exposed to many hate speech comments ($M = 4.73$, $SD = 1.34$) have a more negative perception of social cohesion compared to participants that were exposed to no hate speech ($M = 4.37$, $SD = 1.32$). However, this difference reaches marginal significance ($p = .07$) and thus does not confirm the hypothesis. Moreover, the post hoc test (Bonferroni) also reveals that participants that are exposed to few hate speech comments ($M = 4.75$, $SD = 1.46$) have a more negative perception of social cohesion compared to participants that were exposed to no hate speech ($p = .045$). There are no significant differences between the groups receiving few and many hate speech comments ($p \sim 1.00$). Thus, H3 can only be supported for the homosexual topic and only when comparing no hate speech to few hate speech comments.

In H4 we assumed that the amount of hate speech in the comment section has a positive effect on polarized attitudes toward the group that is attacked. Due to the low α-values, we cannot test the hypotheses as previously intended. However, we decided to do additional exploratory analyses which will be described in the following section.

Exploratory Analyses

To learn something about attitude polarization, we decided to investigate each of the statements separately for both social groups. They served as the dependent variables in the following analyses. As independent variables, we used the stimulus version, preexisting attitudes toward the social groups, and the interaction term of both independent variables. Starting with Muslims, regression analyses show for the statement "Muslims should not be allowed to work at crowded places, such as airports" that only preexisting attitudes predict the agreement with these statements while (the amount of) hate speech has no effect (see Table 1). Thus, participants who hold more negative attitudes toward Muslims agree more with the statement. For the statements "I would support political actions to prevent the building of more mosques" and "Muslims should not be allowed to wear headscarves in public institutions" both the amount of hate speech as well as the preexisting attitudes affect the agreement (see Tables 2 and 3). Further, we find interaction effects. To investigate these effects, we separated the participants into three groups based on the preexisting attitudes toward Muslims (1–5: negative, 6–7: neutral, 8–11: positive) and plotted the interactions. For both statements, the graphs imply that participants who hold negatives

Table 1. Regression analysis for predicting agreement to the statement "Muslims should not be allowed to work at crowded places, such as airports"

	b	β	SE	t-value	p
Intercept	2.19		0.37	5.96	< .001
Stimulus	−0.13	−.12	0.17	−0.08	.45
Preexisting Attitudes	−0.13	−.32	0.05	−2.67	.01
Stimulus × Preexisting Attitudes	0.02	−.16	0.02	0.79	.43
R^2					.06
Adj. R^2					.05
F					8.82***

Note. n = 457. *p < .05; **p < .01; ***p < .001.

Table 2. Regression analysis for predicting agreement to the statement "I would support political actions to prevent more mosques to be build"

	b	β	SE	t-value	p
Intercept	3.20		0.58	5.48	< .001
Stimulus	0.68	.35	0.27	2.48	.01
Preexisting Attitudes	−0.21	−.28	0.08	−2.59	.01
Stimulus × Preexisting Attitudes	−0.08	−.39	0.04	−2.21	.03
R^2					.25
Adj. R^2					.25
F					51.30***

Note. n = 456. *p < .05; **p < .01; ***p < .001.

Table 3. Regression analysis for predicting agreement to the statement "Muslims should not be allowed to wear headscarves in public institutions"

	b	β	SE	t-value	p
Intercept	4.35		0.83	5.25	< .001
Stimulus	0.71	.28	0.39	1.83	.07
Preexisting Attitudes	−0.22	−.22	0.11	−1.97	.05
Stimulus × Preexisting Attitudes	−0.09	−.32	0.05	−1.73	.08
R^2					.17
Adj. R^2					.16
F					30.27***

Note. n = 457. *p < .05; **p < .01; ***p < .001.

attitudes against Muslims agree more with this statement when they encounter (few or many) hate speech comments compared to participants holding positive or neutral attitudes (see Figures 1 and 2). That means hate speech affects especially those with negative attitudes toward Muslims. The confidence intervals show the significant differences.

For homosexuals, regression analyses show for the statements "Homosexual couples should not be allowed to adopt children" and "Homosexuals should not be allowed to get married" that only preexisting attitudes predict the agreement with these statements (see Tables 4 and 5). Thus, participants who hold more negative attitudes toward homosexuals agree more with the demands for restrictions.

For the statement "Homosexuals should not work with children and adolescents" the amount of hate speech affects the agreement (see Table 6). Further, we find an interaction effect. To investigate this effect we built three groups based on the preexisting attitudes of the participants (1–6: negative, 7–9: neutral, 10–11: positive). This time, we chose different attitude values to build the groups because the sample contained only a few people with a negative attitude toward homosexuals. The graphs imply that participants who hold negative and neutral views toward homosexuals agree more to the statement when encountering many hateful comments compared to those with positive preexisting attitudes (see Figure 3).
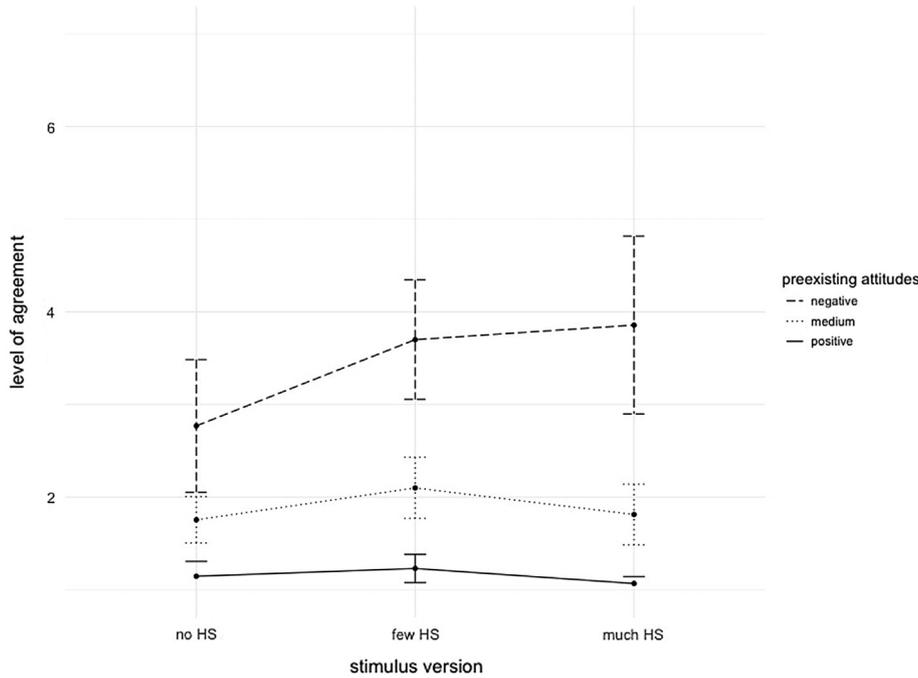
Figure 1. Interaction between preexisting attitudes and amount of hate speech (HS) on the agreement to the statement "I would support political actions to prevent the building of more mosques." $n_{negative} = 77$, $n_{neutral} = 256$, $n_{positive} = 124$.
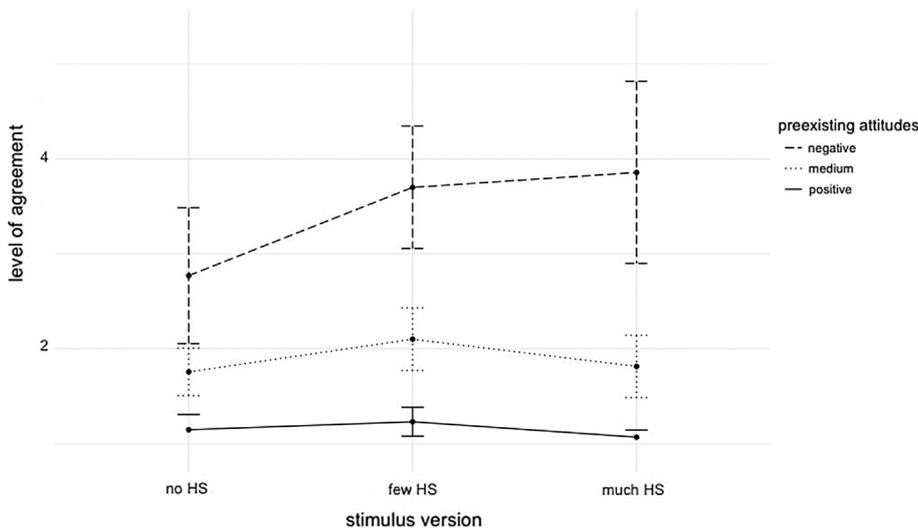
Figure 2. Interaction between preexisting attitudes and amount of hate speech (HS) on the agreement to the statement "Muslims should not be allowed to wear headscarves in public institutions." $n_{negative} = 77$, $n_{neutral} = 256$, $n_{positive} = 124$.

Table 4. Regression analysis for predicting agreement to the statement "Homosexual couples should not be allowed to adopt children"

	b	β	SE	t-value	p
Intercept	3.55		0.81	4.36	< .001
Stimulus	0.26	.13	0.37	0.72	.48
Preexisting Attitudes	−0.21	−.27	0.09	−2.32	.02
Stimulus × Preexisting Attitudes	−0.02	−.13	0.04	−0.61	.54
R^2					.11
Adj. R^2					.11
F					19.18***

*Note. n = 463. ***p < .001.*

Table 5. Regression analysis for predicting agreement to the statement "Homosexuals should not be allowed to get married"

	b	β	SE	t-value	p
Intercept	3.62		0.62	5.84	< .001
Stimulus	−0.38	−.26	0.28	−1.35	.18
Preexisting Attitudes	−0.24	−.40	0.07	−3.44	< .001
Stimulus × Preexisting Attitudes	0.04	.25	0.03	1.16	.25
R^2					.08
Adj. R^2					.07
F					13.36***

Note. n = 463. ***p < .001.

Table 6. Regression analysis for predicting agreement to the statement "Homosexuals should not work with children and adolescents"

	b	β	SE	t-value	p
Intercept	0.35		0.47	0.75	.45
Stimulus	0.95	.84	0.21	4.45	< .001
Preexisting Attitudes	0.08	.19	0.05	1.62	.11
Stimulus × Preexisting Attitudes	−0.10	−.89	0.02	−4.16	< .001
R^2					.11
Adj. R^2					.10
F					18.15***

Note. n = 463. ***p < .001.
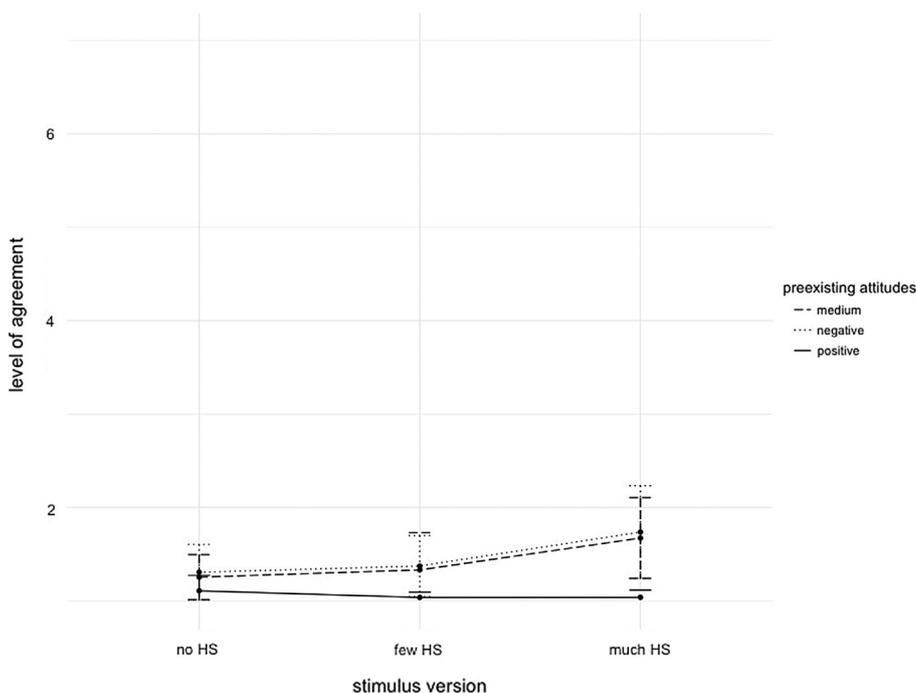
Figure 3. Interaction between preexisting attitudes and amount of hate speech (HS) on the agreement to the statement "Homosexuals should not work with children and adolescents." $n_{negative}$ = 113, $n_{neutral}$ = 123, $n_{positive}$ = 22.

Discussion

The comment section is not just a place where different points of view are exchanged in a respectful manner. Instead, users also spread discriminating content against social groups because of features such as religion, sexual orientation, gender, or disabilities which is referred to as hate speech (Erjavec & Kovačič, 2012). Previous research found that user comments serve as exemplars (Peter et al., 2014) that shape the perception of public opinion (Neubaum & Krämer, 2016) and affect attitudes of readers of user comments (Hsueh et al., 2015). However, all these effects have been found for controversial issues. Thus, it remained unclear if the attacking of social groups has an

effect on perceived public opinion and the formation of attitudes. Since investigating the consequences of hate speech is important to understand its potential role for destructive social dynamics such as the formation of prejudices or polarized attitudes, the present study wanted to fill this gap in research.

For this purpose, we conducted an experimental study varying both the amount of hate speech and the group that was attacked in the comments. Based on previous findings, we assumed effects for perceived public opinion, perceived social cohesion as well as polarized attitudes toward the group that was attacked.

If it comes to effects for perceived public opinion, our study cannot confirm that discriminating comments serve as exemplars. Even though previous studies with a very similar experimental setting report that the one-time confrontation with user comments affects how participants rate the share of people opposing or supporting assisted suicide, adoption for same-sex couples (Neubaum & Krämer, 2016) or the eviction of violent immigrants (Zerback & Fawzi, 2016), this does not hold true for the perception of social groups that have been attacked in comments. All groups overestimated the share of people holding negative attitudes toward Muslims and homosexuals. A possible explanation might be that participants already had an awareness of the presence of hate speech. The majority of Internet users (75%) report to have already noticed hate in the comment section (Landesanstalt für Medien NRW, 2019). Moreover, the political and legal interventions against online hate such as the Network Enforcement Act or the lawsuit of prominent figures such as the politician Renate Kuenast in Germany have been intensively discussed in the news. As a result, participants might have based their judgments on previous encounters with hate speech which explains why the presented discussion in the experiment did not have an effect. Maybe exemplification effects of comments resulting from a one-time confrontation just occur if people have less previous experience with a certain slant in the comment section. This could explain why we did not detect any effects for a perceived public opinion while other studies do report them.

For perceived social cohesion, the attacking of Muslims did not affect how the participants judge the state of the society. This might also be a result of the previous contact with hate speech attacking Muslims. Results by Geschke et al. (2019) indicate that users have noticed hate against Muslims more frequently compared to hate against homosexuals in online environments. Following the idea of desensitization (Soral et al., 2018), repeated exposure to hate speech decreases sensitivity for hate speech. In other words, it makes people get used to that kind of attack which can also cause a decline of attention or sympathy for the victim that is offended (Linz et al., 1989). Maybe processes of desensitization also explain the lack of effect for perceived social cohesion: since people have been frequently exposed to such content, they are not shocked by the comments anymore and do not apply their negative feelings when judging the state of the society. However, hate speech against homosexuals had an effect on the perception of social cohesion. If the comment section contained some discriminating and hateful comments against this social group, participants perceived social cohesion to be lower. As assumed, hate in the comment section attacking others makes it visible that parts of the society are excluded from the collective unit which probably strengthens the perception that social cohesion is low. However, for many hateful comments attacking homosexuals, we could not confirm this effect. A possible explanation could be that if hate dominates the comment section to such a high degree, it is not assumed as representative of society anymore. This perception, or the assumption that such a high amount of hate is a rather unrealistic scenario, could have affected effects for perceived social cohesion in this condition. In general, it should be considered that effect sizes of the significant findings were very low indicating that also for homosexuals, hate speech is not an important determinant for the perception of social cohesion.

If it comes to polarizing attitudes, we found for both groups that the effects of hate speech depend on the specific demand that is investigated. The attacking of Muslims made people with negative and neutral attitudes toward this group oppose the building of mosques more strongly and agree more with the statement that Muslims should not be allowed to wear headscarves in public institutions. If homosexuals got attacked, people with a rather neutral and negative attitude tended to agree more that they should not work with children and adolescents. Polarizing effects occurred to a higher degree for Muslims than for homosexuals since the mean differences between the groups were bigger and effects were significant for two compared to just one item. For the significant statements, effects occurred that can be explained with media priming and desensitization. The discriminating attacks of these groups might have primed stereotypes and lowered the sensitivity for prejudice against both Muslims and homosexuals. This made people more open to agreeing with stereotyped statements themselves. The fact that these effects were only found for people with neutral or negative preexisting attitudes indicates that hate speech can contribute to polarizing tendencies in a society. Also, since prejudice for those with neutral or negative preexisting attitudes increased compared to the control group, social cohesion seems to be negatively affected. These participants tended to show more distrust toward homosexuals and want them to be excluded from specific fields of a society which indicates a state of social dissolution (Lockwood, 1999). Thus, based on these

findings it can be concluded that hate speech can contribute to polarization and also negatively affect social cohesion in a society. This could be shown for two different social groups that have been attacked in the comment section. However, it depends on the specific demands if attitudes get more extreme after the confrontation with hate speech. It is up to future research to investigate which characteristics of demands cause them to be more likely to be influenced by hate speech.

Naturally, our study does not come without limitations. First, the experiment investigated the effects of hate speech in an artificial situation. Participants got confronted with hateful comments in a newsfeed that was not their own. Moreover, we tried to make the comments as realistic as possible but we also had to make sure that the manipulation is not confounded. As a result, it was not possible to include elements such as emoticons (e.g., like, love, anger) or replies to comments even though both elements are common features in the comment section. This limits the external validity of the results.

Moreover, we were unable to create an index for attitudes toward Muslims/homosexuals since reliability scores for both groups were too low. That indicates that the statements that were used captured different facets of stereotyped attitudes which seem to be differently affected by hate speech. Maybe the concept of polarized attitudes was in general too broad. Future studies could focus more specifically on specific types of resentments that can then be measured with several items. This would make the impact of hate speech clearer and also enable more reliable measurement of the dependent variable.

Another critical point concerns the sample of the study. We relied on the *SoSci*-Panel which provides participants with a similar distribution of age and gender as in the German-speaking population. However, the sample contains more people with a high level of education and college degree than usual in the general population. The educational bias might provide an explanation why there were only a few participants with negative attitudes toward Muslims and almost no one with a negative attitude toward homosexuals. However, we find that especially people with negative attitudes toward the social groups are influenced by hateful comments. That means, it is likely that our study underestimates the effects of hate speech due to this bias. Thus, it is important to replicate our study with a sample that shows a more realistic distribution of attitudes toward Muslims as well as homosexuals. It is plausible to assume that polarizing effects of hate speech might even be stronger in a more representative sample and also in society.

In sum, our study is among the first to investigate how hate speech affects the perception of social dynamics as well as effects on attitudes toward social groups. It can be concluded that hate speech can have destructive societal consequences and the fight against online hate needs to be taken seriously. This concerns first of all the news organizations which are mainly responsible for news posts and news articles reaching a large audience. The findings stress the importance of an effective moderation of user comments that detects and responds to hate speech. This would reduce the negative effects of online discussion while it is still possible for users to engage in civil discourse.

Further, the results of the study also emphasize the importance of political and legal interventions against hate speech. Laws such as the Network Enforcement Act or the establishment of special investigation departments have marked important steps in this regard. However, it would also be very important to develop and legally determine definitions of hate speech that enables the prosecution of those spreading severe forms of hate and discrimination online. A solution for less severe forms of hate speech could be to encourage other users to engage in counter speech. Answering hateful comments in a civic manner could overcome the negative effects of hate speech without the necessity of legal intervention.

In sum, the study underlines the importance for researchers, politicians, journalists, and Internet users to increase efforts to reduce hate speech in user comments to a minimum. This is not just necessary to protect those who get attacked in comments but also contributes to more social cohesion in a society.

References

Anderson, A. A., Yeo, S. K., Brossard, D., Scheufele, D. A., & Xenos, M. A. (2018). Toxic talk: How online incivility can undermine perceptions of media. *International Journal of Public Opinion Research, 30*(1), 156–168. https://doi.org/10.1093/ijpor/edw022

Arendt, F. (2013). Dose-dependent media priming effects of stereotypic newspaper articles on implicit and explicit stereotypes: Dose-dependent media priming effects. *Journal of Communication, 63*(5), 830–851. https://doi.org/10.1111/jcom.12056

Bilewicz, M., & Soral, W. (2020). Hate speech epidemic. The dynamic effects of derogatory language on intergroup relations and political radicalization. *Political Psychology, 41*(1), 3–33. https://doi.org/10.1111/pops.12670

Brosius, H.-B. (1999). Research note: The influence of exemplars on recipients' judgements: The part played by similarity between exemplar and recipient. *European Journal of Communication, 14*(2), 213–224. https://doi.org/10.1177/0267323199014002004

Cammaerts, B. (2018). The mainstreaming of extreme right-wing populism in the low countries: What is to be done? *Communication, Culture and Critique, 11*(1), 7–20. https://doi.org/10.1093/ccc/tcx002

Coe, K., Kenski, K., & Rains, S. A. (2014). Online and uncivil? Patterns and determinants of incivility in newspaper website comments. *Journal of Communication, 64*(4), 658–679. https://doi.org/10.1111/jcom.12104

Erjavec, K., & Kovačič, M. P. (2012). "You don't understand, this is a new war!": Analysis of hate speech in news web sites' comments. *Mass Communication and Society, 15*(6), 899–920. https://doi.org/10.1080/15205436.2011.619679

Faris, R., Ashar, A., Gasser, U., & Joo, D. (2016). *Understanding harmful speech online*. Berkman Klein Center for Internet & Society Research Publication. http://nrs.harvard.edu/urn-3: HUL.InstRepos:38022941

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. https://doi.org/10.3758/BF03193146

Friedkin, N. E. (2004). Social cohesion. *Annual Review of Sociology, 30*(1), 409–425. https://doi.org/10.1146/annurev.soc.30.012703.110625

Friemel, T. N., & Dötsch, M. (2015). Online reader comments as indicator for perceived public opinion. In M. Emmer & C. Strippel (Eds.), *Kommunikatonspolitik für die digitale Gesellschaft* (pp. 151–172). DGPuK.

Geschke, D., Klaßen, A., Quent, M., & Richter, C. (2019). *#Hass im Netz: Der schleichende Angriff auf unsere Demokratie: Eine bundesweite repräsentative Untersuchung* [#Hate online: The creeping attack on our democracy: A nationwide representative study]. https://www.idz-jena.de/fileadmin/user_upload/_Hass_im_Netz_-_Der_schleichende_Angriff.pdf

Guo, L., & Johnson, B. G. (2020). Third-person effect and hate speech censorship on Facebook. *Social Media + Society, 6*(2), 205630512092300. https://doi.org/10.1177/2056305120923003

Hsueh, M., Yogeeswaran, K., & Malinen, S. (2015). "Leave Your Comment Below": Can biased online comments influence our own prejudicial attitudes and behaviors? *Human Communication Research, 41*(4), 557–576. https://doi.org/10.1111/hcre.12059

Kallis, A. (2013). Breaking taboos and "mainstreaming the extreme": The debates on restricting Islamic symbols in contemporary Europe. In R. Wodak, M. KhosraviNik, & B. Mral (Eds.), *Right-wing populism in Europe* (pp. 55–70). Bloomsbury Academic.

Kulkarni, V., ElSherief, M., Nguyen, D., Wang, W. Y., & Belding, E. (2018, June 1). *Hate lingo: A target-based linguistic analysis of hate speech in social media*. https://arxiv.org/abs/1804.04257

Küpper, B., Klocke, U., & Hoffmann, L.-C. (2017). *Einstellungen gegenüber lesbischen, schwulen und bisexuellen Menschen in Deutschland: Ergebnisse einer bevölkerungsrepräsentativen Umfrage* [Attitudes towards lesbian, gay and bisexual people in Germany: Results of a representative survey]. Nomos.

Landesanstalt für Medien NRW. (2019). *Ergebnisbericht: Forsa-Befragung zu Hate Speech* [Results report: Forsa survey on hate speech]. https://www.medienanstalt-nrw.de/fileadmin/user_upload/lfm-nrw/Service/Pressemitteilungen/Dokumente/2019/forsa_LFMNRW_Hassrede2019_Ergebnisbericht.pdf

Lee, E.-J., & Jang, Y. J. (2010). What do others' reactions to news on internet portal sites tell us? Effects of presentation format and readers' need for cognition on reality perception. *Communication Research, 37*(6), 825–846. https://doi.org/10.1177/0093650210376189

Lee, S. A., Reid, C. A., Short, S. D., Gibbons, J. A., Yeh, R., & Campbell, M. L. (2013). Fear of Muslims: Psychometric evaluation of the Islamophobia Scale. *Psychology of Religion and Spirituality, 5*(3), 157–171. https://doi.org/10.1037/a0032117

Leiner, D. J. (2016). Our research's breadth lives on convenience samples: A case study of the online respondent pool "SoSci Panel". *Studies in Communication | Media, 5*(4), 367–396. https://doi.org/10.5771/2192-4007-2016-4-367

Linz, D., Donnerstein, E., & Adams, S. M. (1989). Physiological desensitization and judgments about female victims of violence. *Human Communication Research, 15*(4), 509–522. https://doi.org/10.1111/j.1468-2958.1989.tb00197.x

Lockwood, D. (1999). Civic integration and social cohesion. In I. Gough & G. Olofsson (Eds.), *Capitalism and social cohesion* (pp. 63–84). Palgrave Macmillan UK. https://doi.org/10.1057/9780230379138_4

Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: The effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology, 37*(11), 2098–2109. https://doi.org/10.1037/0022-3514.37.11.2098

Muddiman, A. (2017). Personal and public level of incivility. *International Journal of Communication, 11*, 3182–3202.

Neubaum, G., & Krämer, N. C. (2016). Monitoring the opinion of the crowd: Psychological mechanisms underlying public opinion perceptions on social media. *Media Psychology, 20*(3), 502–531. https://doi.org/10.1080/15213269.2016.1211539

Novy, A., Swiatek, D. C., & Moulaert, F. (2012). Social cohesion: A conceptual and political elucidation. *Urban Studies, 49*(9), 1873–1889. https://doi.org/10.1177/0042098012444878

Obermaier, M., Hofbauer, M., & Reinemann, C. (2018). Journalists as targets of hate speech. How German journalists perceive the consequences for themselves and how they cope with it. *Studies in Communication and Media, 7*(4), 499–524. https://doi.org/10.5771/2192-4007-2018-4-499

Peter, C., Rossmann, C., & Keyling, T. (2014). Exemplification 2.0: Roles of direct and indirect social information in conveying health messages through social network sites. *Journal of Media Psychology, 26*(1), 19–28. https://doi.org/10.1027/1864-1105/a000103

Ramasubramanian, S. (2007). Media-based strategies to reduce racial stereotypes activated by news stories. *Journalism & Mass Communication Quarterly, 84*(2), 249–264. https://doi.org/10.1177/107769900708400204

Seise, J., Banse, R., & Neyer, F. J. (2002). Individuelle Unterschiede in impliziten und expliziten Einstellungen zur Homosexualität [Individual differences in terms of implicit and explicit attitudes toward homosexuality: An empirical study]. *Zeitschrift für Sexualforschung, 15*(1), 21–42. https://doi.org/10.1055/s-2002-25178

Sellars, A. (2016). *Defining hate speech*. Berkman Klein Center Research Publication No. 2016-20, Boston University School of Law, Public Law Research Paper No. 16-48. http://dx.doi.org/10.2139/ssrn.2882244

Silva, L., Mondal, M., Correa, D., Beneventura, F., & Weber, I. (2016, May 1). *Analyzing the targets of hate in online social media*. https://arxiv.org/abs/1603.07709

Soral, W., Bilewicz, M., & Winiewski, M. (2018). Exposure to hate speech increases prejudice through desensitization. *Aggressive Behavior, 44*(2), 136–146. https://doi.org/10.1002/ab.21737

Springer, N., Engelmann, I., & Pfaffinger, C. (2015). User comments: Motives and inhibitors to write and read. *Information, Communication & Society, 18*(7), 798–815. https://doi.org/10.1080/1369118X.2014.997268

Sung, K. H., & Lee, M. J. (2015). Do online comments influence the public's attitudes toward an organization? Effects of online comments based on individuals' prior attitudes. *The Journal of Psychology, 149*(3–4), 325–338. https://doi.org/10.1080/00223980.2013.879847

Wilhelm, C., Joeckel, S., & Ziegler, I. (2020). Reporting hate comments: Investigating the effects of deviance characteristics, neutralization strategies, and users' moral orientation. *Communication Research, 47*(6), 921–944. https://doi.org/10.1177/0093650219855330

Winiewsky, M., Hanse, K., Bilewicz, M., Soral, W., Swiderska, A., & Bulska, D. (2016). *Contempt speech, hate speech – Report from research on verbal violence against minority groups*. http://www.ngofund.org.pl/wp-content/uploads/2017/02/Contempt_Speech_Hate_Speech_Full_Report.pdf

Yamamoto, M. (2011). Community newspaper use promotes social cohesion. *Newspaper Research Journal, 32*(1), 19–33. https://doi.org/10.1177/073953291103200103

Zerback, T., & Fawzi, N. (2016). Can online exemplars trigger a spiral of silence? Examining the effects of exemplar opinions on perceptions of public opinion and speaking out. *New Media & Society, 19*(7), 1034–1051. https://doi.org/10.1177/1461444815625942

Zerback, T., & Peter, C. (2018). Exemplar effects on public opinion perception and attitudes: The moderating role of exemplar involvement. *Human Communication Research, 44*(2), 176–196. https://doi.org/10.1093/hcr/hqx007

Zick, A., & Küpper, B. (2012). Zusammenhalt durch Ausgrenzung? Wie die Klage über den Zerfall der Gesellschaft und die Vorstellung von kultureller Homogenität mit gruppenbezogener Menschenfeindlichkeit zusammenhängen [Cohesion through exclusion? How the complaint about collapse of society and the idea of cultural homogeneity is related to group-related misanthropy]. In W. Heitmeyer (Ed.), *Deutsche Zustände, Folge 10* (pp. 152–176). Suhrkamp.

Ziegele, M., Koehler, C., & Weber, M. (2018). Socially destructive? Effects of negative and hateful user comments on readers' donation behavior toward refugees and homeless persons. *Journal of Broadcasting & Electronic Media, 62*(4), 636–653. https://doi.org/10.1080/08838151.2018.1532430

Zillmann, D., & Brosius, H.-B. (2000). *Exemplification in communication: The influence of case reports on the perception of issues.* Erlbaum.

Svenja Schäfer
Department of Communication
University of Vienna
Kolingasse 14-16
1040 Vienna
Austria
svenja.schaefer@univie.ac.at

Svenja Schäfer is a postdoctoral researcher at the Political Communication Research Group, Department of Communication, University of Vienna, Austria. Her research interest includes the use and effects of news in digital environments, especially social network sites and user comments.

Michael Sülflow is a postdoctoral researcher at the Department of Communication Research, Johannes Gutenberg University Mainz, Germany. His research interest includes Political Communication as well as the contents and effects of Visual Communication.

Liane Reiners is a research assistant at the Department of Communication Research, Johannes Gutenberg University Mainz, Germany. Her research interest includes forms and effects of hate speech, stereotypes, and prejudices toward different social groups.

How Humorous Posts Influence Engagement With Political Posts on Social Media

The Role of Political Involvement

Raffael Heiss

Center for Social & Health Innovation, Management Center Innsbruck, Austria

Abstract: Individuals frequently process political posts on social media in the context of humorous, non-political posts, which research suggests may stimulate or dampen their engagement with the political posts depending on their political involvement. To clarify that claim, I conducted a 2 × 2 experiment ($N = 286$) in which individuals viewed political posts situated among either humorous or non-humorous posts, all presented as video-recorded posts on a social media newsfeed, in a condition of either low or high political involvement. Among the results, the humorous posts directly boosted general attention, the elaboration of political posts, and the acquisition of political knowledge in the low political involvement group and stimulated political participation in the high political involvement group. Further analyses revealed that, in the low involvement group, increased attention and the elaboration of the posts may have mediated humor's effect on the acquisition of political knowledge. Meanwhile, its positive effect on participation in the high involvement group occurred independently from general attention and the elaboration of the posts. Altogether, the findings suggest that humorous social media contexts may benefit the acquisition of political knowledge and political participation.

Keywords: social media, humor, context effect, political participation, political knowledge

Social media have become important sources of political information, especially for today's younger generations (Heiss & Matthes, 2016). However, compared with pre-existing media contexts, social media present political information to be processed within an entirely new mode of reception. For one, individuals are exposed to political posts amid a myriad of other information on social media (Bode, 2016). Scrolling quickly through their newsfeeds and jumping from one post to the next, users have limited time to screen and evaluate individual posts on their newsfeeds. In that situation, contextual content may influence how they, as citizens, process political posts on their newsfeeds. A prominent part of that potentially influential content on social media is humor (Davis et al., 2018; Heiss & Matthes, 2021; Park et al., 2009; Thorson, 2014).

Despite that overlap in content, it remains unclear whether frequent exposure to political information on social media contextualized amid humorous, non-political content trivializes individuals' engagement with politics (Postman, 1986; Wirth et al., 2010) or increases their attention to politics, especially if they rarely engage in politics in the first place (Baek & Wojcieszak, 2009; Baum, 2002). In fact,

until now, research on the political effects of humorous, non-political posts on social media or how those effects may depend on individuals' political involvement (Dimitrova & Matthes, 2018; Heiss & Matthes, 2021) has remained undeveloped. That gap in the literature needs to be filled, however, because social media do indeed provide "animated stimuli and a relaxing environment, in which political information mixes with updates about pets and babies" (Bode, 2016, pp. 28–29) such that the "lines between political and nonpolitical information become increasingly blurred" (Dimitrova & Matthes, 2018, p. 336).

Aiming to partly fill that gap, this article seeks to improve current understandings of how social media users process political posts when they appear amid humorous, non-political posts on their newsfeeds. In a study involving a forced exposure experimental design, I showed participants a simulated social media newsfeed containing video-recorded political posts situated amid either humorous or non-humorous posts. Added to that, I manipulated the participants' political involvement with the political posts prior to exposure. Although the approach did not entail simulating an externally valid (i.e., interactive) social media

environment, the results nevertheless provide initial evidence on social media users' psychological capacity to process and engage with political posts when they appear amid unrelated humorous posts.

Political Effects of Humor

A large body of literature discusses the role of entertainment in citizens' political engagement. Perhaps most prominently, Postman (1986) has argued that greater volumes of entertainment information increasingly inhibit citizens' deeper engagement with political information. Extending that argument, Prior (2005) has furnished evidence suggesting that media environments affording users a high degree of choice may discourage users with a high relative preference for entertaining content from becoming exposed to and thus learning from political news. Finding similar evidence, Kim et al. (2013) observed that incidental news exposure online may positively predict political participation but only for individuals with a lower relative preference for entertaining content. In line with those findings, other authors have characterized social media as simply another high-choice environment in which less politically involved individuals' attention to political issues is constantly distracted by more appealing humorous content and, as such, encourages slacktivism at best (Rothmund & Otto, 2016; Theocharis & Quintelier, 2016; van Aelst et al., 2017).

Against that trend, however, other authors have argued that incidental encounters with political content on social media can stimulate political exposure specifically among individuals less interested in politics (Valeriani & Vaccari, 2016; for a critical perspective, see Heiss & Matthes, 2019). One reason may be that less politically involved individuals often encounter political posts situated amid humorous ones, both of which demand cognitive resources. Research has shown that political humor can indeed activate attention and thus the acquisition of political knowledge and participation in politics (Baek & Wojcieszak, 2009; Baum, 2002; Bode & Becker, 2018). At the same time, other findings indicate that political humor's positive effects may be limited. For example, Young (2008) found that humorous political messages, compared with non-humorous ones, may increase the use of cognitive resources for comprehending humor but also decrease their use for processing message-relevant content.

Taken together, findings on the effects of political humor remain mixed, while research on the political effects of non-political humor has rarely been conducted. However, the potential findings of such research could be especially relevant in the social media era, when political posts are frequently processed alongside humorous, non-political ones.

In that new context, the distracting versus attention-enhancing function of humor should be closely re-examined.

Unrelated Humor on Social Media

In presenting humorous content, social media offer a different context from traditional media contexts because the humorous content among which political posts may be contextualized is usually not political in nature (Heiss & Matthes, 2021). On social media, such situations have become commonplace. Imagine scrolling down a newsfeed and encountering a funny video of a cat followed by a serious post about new tax law. Whereas the funny video is entirely unrelated to the news post, because nearly all posts are quite short, the video may not be processed entirely free from the influence of the news post. Although that phenomenon is underexplored, past studies conducted on traditional media contexts may help to clarify how politically unrelated humorous content on social media might affect the processing of political posts.

In one of the few existing studies on how humor unrelated to politics affects political outcomes, Matthes (2013) found that in political speeches, using such humor can distract individuals from engaging in political learning processes, while humor that is related to politics may increase the elaboration of the political content among individuals with high needs for humor. Even so, the contexts of political speeches, whose audiences tend to be highly attentive to political content, differ entirely from social media contexts. In another study on how funny advertisements preceding a political news show affected how individuals processed the news, Wirth et al. (2010) found that positive mood induced primarily negative effects, for the participants ultimately evaluated the news as being less important or serious.

In advertising, research has indicated that humor can stimulate individuals' attention to information that they would not otherwise process. For example, evidence suggests that humor can stimulate attention even to products demanding low involvement (Chung & Zhao, 2003; Eisend, 2009) because humor rewards individuals with pleasant feelings and thus incentivizes them to pay close attention to the humorous components of messages (Eisend, 2009; Zillmann et al., 1980). Despite concern that topically unrelated humor may distract from the non-humorous parts of messages, research has also indicated that such humor may exert weaker but nevertheless positive effects on persuasion, though evidence on recall and recognition remains too weak to recommend any conclusions (Eisend, 2009).

All told, although research on unrelated humor's effects has focused on traditional media contexts, especially ones presenting commercial advertising, social media constitute a new context in which political and non-political content often occur separately from but in juxtaposition with each other. In such cases, the humorous content is not only

unrelated to the political content but also distinct in story-line and topic. Thus, the extent to which scholars can learn and draw conclusions about the effects of humorous posts on social media from the literature remains limited.

The Role of Political Involvement

In this article, I am specifically interested in how political involvement may moderate the effects of humorous, non-political posts on engagement with political news posts in social media contexts. *Political involvement*, defined as a high motivation to engage with political issues that prompt attention to, deeper knowledge of, and stronger behavioral engagement with politics (Huddy & Khatib, 2007), is triggered by well-known social factors, including education, family background, and/or the wider social network. At the same time, gaps in political involvement may be explained by the media choices made by individual citizens (Norris, 2001; Prior, 2010). For example, individuals who begin using social media with lower levels of political involvement may prefer non-political sources on social media and, in turn, curate their newsfeeds to meet their non-political preferences (Knoll et al., 2018).

However, citizens are not the sole curators of their social media newsfeeds. In fact, network acquaintances, strategic actors (e.g., journalists and politicians), and algorithmic choices also co-design personal newsfeeds (Thorson & Wells, 2016). For that reason, users may thus incidentally encounter political information that they did not seek in the first place (Valeriani & Vaccari, 2016). As a consequence, just as they may more often be exposed to political information in their newsfeeds, ones with low political involvement may also be exposed to such information from time to time (Heiss & Matthes, 2021). Even so, the degree to which they process incidental encounters with political content on social media may heavily depend on their political involvement (cf. Knoll et al., 2018). In fact, if users are actively involved in politics, then they are likely to appraise encounters with political content as being highly relevant. As such, they may not only screen the content but also develop certain goals for information processing; they may read the post, click on the link for further information, and thus engage in more thorough learning processes (Heiss & Matthes, 2021; Karnowski et al., 2017).

Based on that reasoning, initial involvement in politics may determine how individuals process and engage with political posts on social media. However, other reasoning suggests that the often humorous posts preceding and following political posts in the newsfeed may influence how users process the political ones (Bode, 2016).

Effects of Humor on Political Outcomes

Interested in identifying humorous content's effects on general attention, the elaboration of political content, the

acquisition of political knowledge, and political participation depending on the individual's political involvement, I measured political involvement as *intended* political participation – that is, the self-reported likelihood of performing a political act. Because those four outcome variables are all interlinked, however, one could assume that they are affected sequentially. To begin, evidence strongly suggests that humor's presence is associated with individuals' attentiveness and thus their processing capacity. Thus, I conceptualized attention as to whether individuals pay attention to posts on their newsfeeds in general (i.e., both political and non-political posts). Such a general level of attention may increase the likelihood of the in-depth elaboration of political posts, defined as whether individuals generate their own thoughts about the political posts encountered (Petty & Cacioppo, 1986). Of course, the effect's extent may depend on how much of the increased attention is attributed to the processing of the political instead of the humorous posts (Keib et al., 2018; Tam & Ho, 2005).

The elaboration of political posts, by contrast, has been identified as an important prerequisite for gaining political knowledge and may affect political participation (Eveland, 2001; Shah et al., 2007). For example, individuals may increase their knowledge only if they process and thus store encountered content in their memories. Furthermore, they may develop participatory intentions only when they engage with the content, for only then may they identify a problem and develop a desire to change, or prevent the change of, the current political state (Knoll et al., 2018; Kruglanski et al., 2015). Even though those sequential theoretical effects may make sense theoretically, I could not test them in my study, because I manipulated humor and involvement only. Because I can make only causal claims concerning the direct effects of humor and involvement, additional experimental studies are needed to test the causal relationships between attention, elaboration, participation, and knowledge.

Hypotheses

The effect of humorous social media posts on attention to content, the elaboration of content, and knowledge about and participation with such content may depend on individuals' prior political involvement. For one, I assumed that individuals with low political involvement do not engage with political posts unless their attention is stimulated by an external driver (e.g., humor). Thus, even humorous, non-political posts in social media newsfeeds can positively affect users' level of cognitive activation, because people need to activate cognitive resources in order to comprehend humorous messages and are thus rewarded with positive feelings (Heiss & Matthes, 2021; Matthes, 2013;

Suls, 1983). That dynamic may trigger learning processes specifically among individuals with low levels of political involvement, who are generally not attentive in humor-free environments. As a result of their cognitive activation, they may become attentive and experience passive learning processes, through which they may inadvertently absorb political content (Krugman & Hartley, 1970; Zukin & Snyder, 1984). They may also become more likely to intentionally elaborate upon political content (Baek & Wojcieszak, 2009; Baum, 2002; Bode & Becker, 2018). Therefore, individuals with low political involvement, upon being exposed to humor, may be more likely to store political content in their memories and retrieve it later. On top of that, processing political content more actively may induce stronger behavioral effects, because such processing can create new participatory goals via new knowledge structures or at least prime for realizing existing goals (Higgins, 1996; Knoll et al., 2018).

Following that logic, I assumed that if individuals lack prior political involvement, then the humorous posts may activate their cognitive resources to process the political content and thus stimulate knowledge acquisition and behavioral effects. Thus, my first hypothesis was:

> *Hypothesis 1 (H1)*: Non-political humor increases (a) general attention, (b) the elaboration of political posts, (c) the acquisition of political knowledge, and (d) intended political participation among individuals in the low political involvement condition.

Drawing on goal systems theory and the limited capacity model, I additionally assumed that humorous posts would negatively affect individuals with high political involvement, who generally have strong initial political processing motivations and may thus pay attention to political content without needing external drivers (e.g., humor). In fact, additional, politically unrelated humorous messages may even distract them from their initial processing goals (Knoll et al., 2018; Matthes, 2013). According to goals systems theory, individuals form goals based on personal needs and desires, and in a given situation, some goals are prioritized above others (Kruglanski et al., 2015). Thus, if individuals have already formed strong processing goals when it comes to political information, then the in situ activation of a competing goal – in the present case, experiencing pleasure from humor – may inhibit their actions toward realizing the initial goal of reading a political post (Shah et al., 2002), because "a message may require more resources than the message recipient has available to allocate to the task" (Lang, 2000, p. 51). In short, if message recipients switch their goal from encoding political content to encoding the politically unrelated humorous parts of the message, then they have less capacity available to retrieve and store the political content (Lang, 2000).

Following that theoretical reasoning, individuals may spend their limited capacity on processing the content of a newsfeed by encoding and storing more information from either the political post or the unrelated humorous posts. As a consequence, politically involved individuals may become distracted and at least partly replace their initial political processing goal with a competing non-political processing goal (i.e., consuming humor). In that context, "the activation of one goal automatically leads to the inhibition (i.e., lower accessibility) of another, competing goal" (Shah et al., 2002). Thus, I assumed that among highly politically involved individuals, humor may hinder the in-depth processing of political content, dampen the acquisition of political knowledge, and lower the intention to participate politically. Thus, my second hypothesis was:

> *Hypothesis 2 (H2)*: Non-political humor is unrelated to attention but decreases (a) the elaboration of political posts, (b) the acquisition of political knowledge, and (c) intended political participation in the high involvement condition.

By contrast, I did not pose a hypothesis about the effect of humor on attention in the high involvement condition. After all, attention may already be high in that group due to the political content, and the additional humorous content may shift some of the attention to the humorous aspects, but may not increase overall attention to the newsfeed.

Method

I conducted a 2 × 2 experiment using a sample of university students ($N = 286$; $M_{age} = 22.70$, $SD = 3.32$), 80.42% of whom had high school degrees, 19.58% of whom had college degrees, and 67.48% of whom were women. Using a sample of students was appropriate for my study because students tend to have a common concept of humor, which was important for successful manipulation in the study (Darke et al., 1998). However, it also limits the generalizability of my findings, as addressed in the limitations section at the end of the article. The study was part of a research course at a large university in Austria, such that students contributed to creating the stimulus material and recruiting independent participants. All respondents were randomly assigned to one of four experimental conditions, and data were collected from June 5 to June 10, 2018.

Stimulus Material

I manipulated involvement with the political issue presented in the political post as a proxy for political involvement.

To that end, participants were either assigned to read a news article about a new law set to increase tuition at universities (i.e., high involvement condition) or a news article about math scores on recent national high school examinations (i.e., low involvement condition). Following that approach, the high involvement group was already familiar with the political issue before exposure to the posts on the newsfeed. Following Petty and Cacioppo (1986), I also manipulated the personal consequences associated with the issue. That is, if participants believe that an issue may personally affect them, then they "become more motivated to process the issue-relevant arguments presented" (Petty & Cacioppo, 1986, p. 146). Both news articles, presented as online news from a non-identifiable source, were the same length and appeared in the same layout across the conditions (see Appendix). I also calculated readability statistics in terms of grade-level using the quanteda package in R (Benoit et al., 2018), which uses a German adaption of the SMOG grading (McLaughlin, 1969). The grade levels of the texts – 8.25 in the high involvement condition and 6.16 in the low involvement condition – were deemed acceptable, considering that the participants were university students.

To manipulate the context (humor vs. no humor), I exposed participants to three political posts embedded in 10 non-political posts from a Facebook newsfeed, all captured in a short video such that they appeared successively in 10-second intervals. In the humorous condition, participants saw humorous, non-political posts, whereas, in the control group, their counterparts saw posts that were neither political nor humorous. In both groups, the non-political posts were paired in terms of structure and content but varied in terms of the presence or non-presence of humorous cues. For example, a non-political post in the non-humorous condition included a horse standing in a field, whereas the funny version of that post in the humorous condition included a meme with a horse taking a selfie (see Appendix, Figure A3). The source of the political posts, their content, and the time of their appearance in the video were constant across both groups.

By source, one political post came from the local student union, whereas the other two came from the Austrian Public Broadcaster, the ORF. The former, in which the local student union emphasizes its opposition to the tuition fees, guarantees support for affected students, and provides information about a petition against the new law. By contrast, the first post from the ORF explained opposition to the new law because it will not solve existing problems in teaching and research and because it neglects expert opinions. By further contrast, the second post from the ORF stated that experts expected high psychological pressure on students, especially among students from lower-income families.

I used the forced exposure technique to guarantee internal validity and ensure that each participant saw each post for the same amount of time (for similar approaches, see Heiss & Matthes, 2016; Kruikemeier et al., 2016). Nevertheless, the approach did not afford a real-life experience on social media, in which users can switch from one post to the next or even engage with posts by liking and/or sharing content (de Vreese & Neijens, 2016).

Measures

Unless stated otherwise, all items were measured on a 7-point Likert scale, ranging from 1 = *disagree* to 7 = *agree*.

Dependent Variables

Attention ($\alpha = .83$, $M = 4.64$, $SD = 1.57$) was measured with three items asking participants whether they agreed that they (a) had paid attention to the content in the newsfeed, (b) had concentrated while following the posts in the newsfeed, and (c) had thought about other things while following the newsfeed (reversed). To measure cognitive elaboration ($\alpha = .87$, $M = 4.59$, $SD = 1.52$), I asked participants whether they agreed that they (a) had intensively thought about the content of the political posts, (b) had focused on the facts in the political posts, (c) had critically reflected upon the content of the political posts while reading, and (d) had not really thought about the content of the political posts (reversed; Eveland, 2001). Next, intended political participation (1 = *unlikely*, 7 = *very likely*; $\alpha = .81$, $M = 2.99$, $SD = 1.29$) was measured by asking participants how likely they were to participate in political activities related to the issue of the political posts, including by (a) signing a petition, (b) liking or sharing the political posts that they had seen, (c) writing a short comment about the issue, (d) attending a related political event, (e) participating in a related demonstration, and (f) discussing the issue with friends (e.g., Kim et al., 2013). Last, to measure the acquisition of political knowledge ($M = 3.28$, $SD = 1.65$), I asked participants six multiple-choice questions about the three political posts, and in each section, they could select one of four choices, including "I don't know." I added the sum of the correct responses, which resulted in an additive index from 0 to 6.

Control Variables

Political interest (1 = *not at all interested*, 7 = *very interested*; $\alpha = .92$, $M = 4.87$, $SD = 1.50$) was measured with three items asking participants how interested they were in (a) political issues, (b) political news, and (c) politically relevant social developments. By comparison, social media use (1 = *never*, 7 = *often*; $M = 5.97$, $SD = 1.47$) was measured with a single item asking participants how frequently they use social media (e.g., Twitter, Facebook, and Instagram). Next,

entertainment user motivation (α = .84, M = 5.17, SD = 1.31) was assessed by asking participants whether they used media (a) to be entertained, (b) to watch entertaining pictures or videos, (c) to pass time, and (d) to find entertainment. Last, political user motivation (α = .91, M = 3.99, SD = 1.52) was measured with four questions asking participants whether they used media (a) to access political information, (b) to familiarize themselves with different perspectives about politics, (c) to follow political news, and (d) to follow current political events (Park & Lee, 2014; Quan-Haase & Young, 2010).

Treatment Check Variables

Perceived funniness (α = .94, M = 3.95, SD = 1.82) was measured with four items asking participants whether they agreed that the posts in the newsfeed were (a) funny, (b) entertaining, (c) tedious (reversed), and (d) boring (reversed). Issue-specific political involvement (α = .88, M = 5.40, SD = 1.489) was measured with four items asking whether participants agreed that (a) the issue was personally important to them, (b) the developments around that issue were personally important to them, (c) they were personally interested in the results of the discussion on the issue, and (d) the issue did not have any significance to them personally (reversed).

Results

Randomization and Treatment Checks

To perform randomization and treatment checks for the variables, I ran simple regression models and switched reference groups to test differences between the four experimental groups. I used linear regression with ordinary least squares for continuous outcome variables and logistic binomial regression for binary outcome variables (i.e., gender and education). The participants were equally distributed across the four groups: the low involvement/no humor group (n = 73), the low involvement/humor group (n = 77), the high involvement/no humor group (n = 65), and the high involvement/humor group (n = 71). I conducted randomization checks by comparing the means of groups or the proportions of control variables measured prior to stimulus exposure across the groups. Although I did not detect any significant differences between groups for age, gender, education, social media use, social media users' political motivations, or their entertainment motivations, I did find that political interest was distributed somewhat unevenly across the groups. More precisely, participants in the low involvement/no humor condition scored lower on political interest than participants in the high involvement/humor group (unstandardized mean difference: b = −0.69,

p < .01) and the high involvement/no humor group (b = −0.65, p < .05). No significant differences emerged between the two low involvement groups or between the two high involvement groups. Political interest was used as a control variable in all models testing treatment effects.

I tested the humor manipulation by asking participants about the perceived funniness of the posts on the newsfeed. Participants in the humor condition scored significantly higher on the pooled measure of those items (i.e., mean scale) than their counterparts in the non-humor group (unstandardized mean difference: b = 1.39, p < .001). Meanwhile, participants in the high involvement condition scored higher on issue-specific involvement (i.e., mean scale) than ones in the low involvement group (b = 0.69, p < .001). Those effects remained highly significant across conditions when I controlled for political interest.

Hypotheses Testing

To test my hypotheses, I used ordinary least squares regressions while controlling for demographic characteristics, political interest, social media use, and political and entertainment motivations in media use (Darlington & Hayes, 2017). All control variables were measured prior to stimulus exposure, and in all models, the low involvement/non-humorous condition served as the reference group. Table A1 in the Appendix provides an overview of the intercorrelations among the dependent variables. I also performed a confirmatory factor analysis of the theoretically linked dependent variables (Rosseel, 2012), but excluded acquisition of political knowledge, which is a formative variable (e.g., Bollen & Diamantopoulos, 2015). The analysis revealed support for a three-factor solution with an acceptable model fit (RMSEA = 0.08; SRMR = 0.06; $\chi^2(62)$ = 184.55, p < .001; CFI = 0.93). All factor loadings appear in Table A2 in the Appendix.

In the next step, I tested the effects of humor manipulation on general attention, the elaboration of the political content, acquisition of political knowledge, and intended political participation. H1 assumed that in the low political involvement group, humor would increase all four variables. The results of the regression models, shown in Table 1 and visualized in Figure 1 (i.e., with predicted mean values calculated from Table 1 and covariates set to mean values; Fox, 2003), indicated support for H1a, H1b, and H1c. In the low involvement group, participants in the humor versus the non-humor group scored significantly higher for general attention (b = 0.67, p < .01), the elaboration of political posts (b = 0.45, p < .05), and the acquisition of political knowledge (b = 0.75, p < .01). However, no effect on the intention for political participation emerged, meaning that H1d was rejected.

Table 1. Treatment effects based on ordinary least squares regressions with control variables

	General attention b (SE)	Elaboration of political content b (SE)	Acquisition of political knowledge b (SE)	Intended political participation b (SE)
Age	0.002 (0.03)	−0.06* (0.03)	−0.01 (0.03)	−0.03 (0.02)
Man	−0.06 (0.21)	0.07 (0.19)	0.22 (0.21)	−0.48** (0.15)
College degree	−0.39 (0.25)	−0.06 (0.23)	−0.11 (0.26)	−0.18 (0.19)
Political interest	0.02 (0.09)	0.17* (0.08)	0.20* (0.09)	0.15* (0.07)
Social media use	−0.01 (0.06)	0.03 (0.06)	−0.09 (0.07)	0.01 (0.05)
Entertainment motivation	0.02 (0.07)	−0.08 (0.06)	−0.05 (0.08)	−0.06 (0.05)
Political motivation	0.13 (0.09)	0.16* (0.08)	0.02 (0.09)	0.18** (0.07)
Humor/HI[a]	0.88*** (0.26)	0.92*** (0.23)	0.63* (0.27)	0.79*** (0.19)
No humor/HI[a]	0.71** (0.27)	0.91*** (0.24)	0.70* (0.28)	0.38[+] (0.20)
Humor/LI[a]	0.67** (0.25)	0.45* (0.23)	0.75** (0.26)	−0.03 (0.19)
Constant	3.49*** (0.99)	4.02*** (0.89)	2.53* (1.03)	2.95*** (0.74)
Observations	286	286	286	286
Adjusted R^2	0.05	0.19	0.08	0.22

Note. [a]Reference category = no humor/LI; HI = high involvement; LI = low involvement. [+]$p < .1$; *$p < .05$; **$p < .01$; ***$p < .001$.
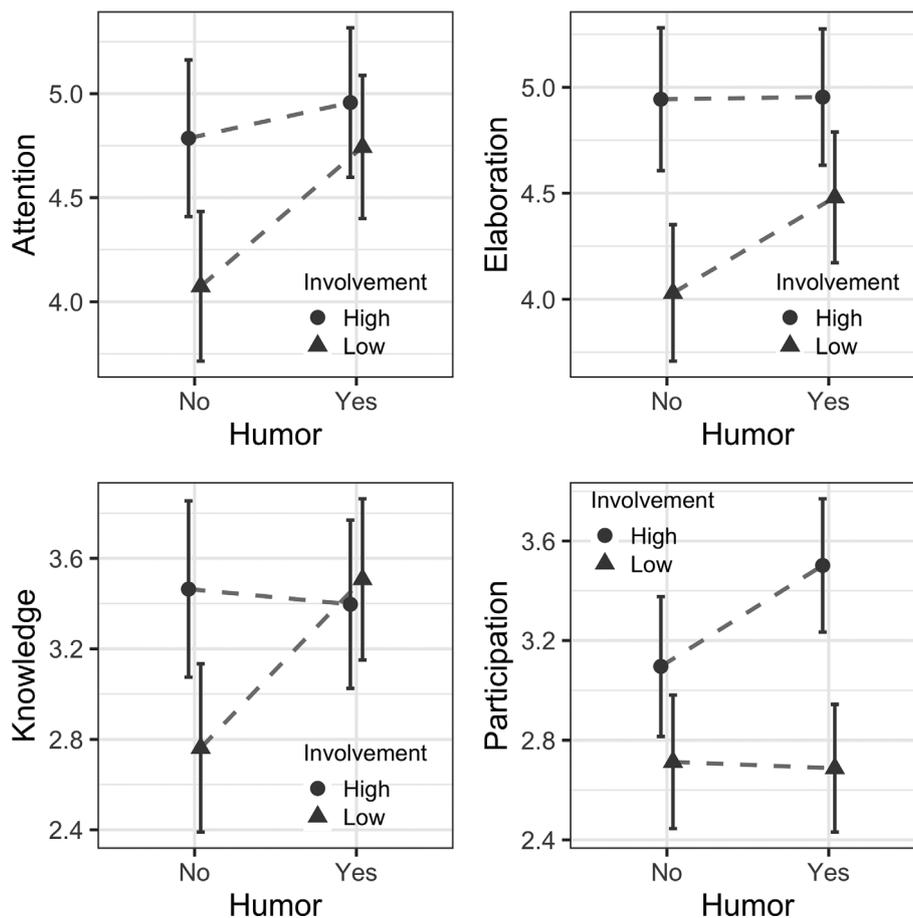
Figure 1. Conditional effects of humor on general attention, elaboration of political posts, acquisition of political knowledge, and political participation. Error bars indicate 95% confidence intervals. Predicted mean values were calculated from Table 1, and covariates were set to mean values (Fox, 2003).

H2 assumed that in the high political involvement group, humor would decrease (a) the elaboration of political content, (b) the acquisition of political knowledge, and (c) intended political participation. However, within the condition, the humor group did not significantly differ from the non-humor group in the elaboration of political content ($b = 0.01$, $SE = 0.24$, $p = .96$) or acquisition of political knowledge ($b = −0.07$, $SE = 0.27$, $p = .81$). As expected,

humor also did not affect attention ($b = 0.17$, $SE = 0.26$, $p = .52$). By contrast, in the high involvement group, humor did significantly increase political participation ($b = 0.41$, $SE = 0.19$, $p = .04$). However, the effect was positive and thus points in the opposite direction than I expected. Thus, I found no support for H2.

Additional Analyses

I also examined whether the identified effects of humor on knowledge and participation were mediated by general attention and the elaboration of political posts – that is, the two variables indicating the depth of cognitive processing that may thus precede learning and behavioral effects. I did so by adding attention and elaboration as independent variables to the two models predicting knowledge and participation scores in Table 1 (see Table A3 in the Appendix for full results).

Among the results, general attention ($b = 0.28$, $SE = 0.07$, $p < .001$) and the elaboration of the political content ($b = 0.17$, $SE = 0.08$, $p = .03$) were both significant predictors of the acquisition of political knowledge. Including the two variables in the knowledge model modified humor's effect in the low involvement group, and the original mean difference of 0.75 points weakened and lost significance ($b = 0.48$, $SE = 0.25$, $p = .05$). Both variables played a similar role in diminishing the treatment effect. To be precise, with only general attention in the model, humor's effect was 0.50 ($b = 0.50$, $SE = 0.25$, $p = .05$), and with only elaboration, humor's effect was 0.58 ($b = 0.58$, $SE = 0.25$, $p = .02$). Such results may indicate the mediating role of general attention and the elaboration of the political content in predicting the acquisition of political knowledge.

In predicting political participation, only the coefficient of elaboration achieved statistical significance ($b = 0.28$, $SE = 0.06$, $p < .001$). However, including the two variables did not substantially change humor's significant coefficient in the high involvement group, thereby indicating that the two variables did not play a mediating role in the group.

Discussion

The results of the study shed new light on how humorous, non-political posts affect social media users' engagement with political posts in situations of low and high political involvement. The results, indicating positive but no negative effects of humorous posts, suggest that such posts can increase general attention to social media newsfeeds, the elaboration of political content encountered there, and the acquisition of political knowledge among less politically involved individuals. Additional analysis also indicated that both general attention and the elaboration of the

political content were significant independent predictors of knowledge that partly explained the treatment effect.

The reason for those positive effects on knowledge may be that among less politically involved individuals, humor can activate cognitive resources, which are consequently also used to process political content. For that dynamic, I identified two possible routes. The first route is a more or less unconscious process, in which individuals absorb more humor-unrelated information inadvertently via passive learning (Krugman & Hartley, 1970; Zukin & Snyder, 1984). By definition, *passive learning* occurs in environments that reduce the resistance to learning and in which users become more accepting of the information encountered (Bode, 2016). A humor-laden context may facilitate such an environment. In the second route, individuals engage in the intentional elaboration of political content. In that process, initially less politically involved individuals activate cognitive resources to process not only the humorous content but also the political content in the newsfeed.

Among other results, humor did not affect political participation in the low involvement group, possibly because political participation is a goal-oriented behavior (Kruglanski et al., 2015). Thus, if individuals are uninvolved with a political issue and lack initial political goals, then mere humor-induced processing may not be strong enough to induce behavioral intentions (Knoll et al., 2018). In other words, some level of systematic cognitive engagement with the political content is needed to form goals and develop behavioral intentions to those ends. Along those lines, only the elaboration of the political content, not attention to the newsfeed per se, significantly related to political participation. Given humor's positive effect on the elaboration of political content in the low involvement group, positive, indirect, across-time effects of humor on political participation via the increased elaboration of political content remain possible.

Second, and against my expectation, some evidence suggested that humor may also positively affect more politically involved individuals. Although I found no evidence of effects on general attention, the elaboration of political content or the acquisition of political knowledge, more politically involved individuals did report higher levels of intended political participation when they encountered the political posts in a humorous environment. One explanation may be that exposure to humor elicits positive feelings, which may consequently increase willingness to engage in more effortful behavior (Gardner, 1985). However, inducing such effects requires a certain level of political involvement and, in turn, cognitive engagement, which may explain why no direct positive effect surfaced for humor among the politically less involved.

All in all, I found positive outcomes for both less and more politically involved individuals. First, among the less

involved, the humorous context may have boosted the acquisition of political knowledge, mostly due to their increased general attention and a higher likelihood for the more in-depth elaboration of political content. While I did not find a direct effect of humor on political participation among the less involved, indirect effects via the elaboration of political content remain possible and need to be further explored. Second, among the highly involved, a humorous environment may have directly stimulated political participation. Because encounters with humor may increase positive feelings, when those feelings are combined with high political involvement, individuals may report a greater willingness to engage in effortful behavior. However, that second effect needs to be further investigated and specifically tested in media environments marked by free choice. In such environments, positive feelings may induce individuals to selectively expose themselves to mood-congruent entertainment content, thus leading to more pronounced distracting effects.

Limitations

The study involved a few notable limitations. First, to keep internal validity high and allow robust causal conclusions, I employed a forced exposure design, in which participants could not select or interact with the content encountered. Thus, the results allow only inferences about how new situations for receiving messages, in which multiple posts are quickly processed in sequence, may influence the processing of political posts. In the future, researchers need to replicate my findings by using more interactive experimental designs and observational studies (e.g., panel studies or mobile experience sampling). Second, I used self-reported measures of general attention, the elaboration of political content, and intended political participation. Such measures may, however, over-or underestimate actual behavior (Junco, 2013). Thus, researchers also need to address that possibility by tracing physical reactions (e.g., eye tracking) and by observing actual behavior. Third, the findings preclude any causal conclusions about the interrelationships between general attention, the elaboration of political content, the acquisition of political knowledge, and intended participation. Those interrelationships need to be tested in a separate experimental setting. Fourth, because my sample consisted of college students, the effects found the need to be replicated for other social groups and by using samples that are more representative of the general population. Likewise, the stimulus material was aligned to the specific target group, meaning that I could not portray a large variety of political or humorous content. However, the effects of humorous posts may depend on not only whether they include emotional cues

or are presented with strong visual appeals but also whether the accompanying political posts contain soft or hard news. Last, I tested the effects of humorous posts because they appear frequently on social media – for example, as funny memes and videos. However, other non-political content, including non-humorous entertainment musical and video content, may also elicit attention and affect political information processing. Researchers should address all of those issues to broaden current understandings of humorous as well as non-humorous posts.

Conclusion

Those limitations notwithstanding, the findings contribute to theoretical understandings of how politically unrelated humor affects the processing of political posts on social media. Above all, humorous posts may trigger active and passive learning processes among the politically less involved and stimulate behavioral intentions among their highly involved counterparts. Thus, concerns that a mix of humorous and more serious political posts on social media may inhibit political learning and dampen political participation may be unfounded. The findings also inform research on news exposure, which has largely neglected the role of context effects on social media. For example, incidental political exposure may be more likely to boost political learning if less politically involved individuals consume them under the condition of elevated attention, even if that attention is triggered by something else in the newsfeed. Those context effects are key characteristics of today's social media environments and need to be considered to better understand the political consequences of changing information environments.

References

Baek, Y. M., & Wojcieszak, M. E. (2009). Don't expect too much! Learning from late-night comedy and knowledge item difficulty. *Communication Research, 36*(6), 783–809. https://doi.org/10.1177/0093650209346805

Baum, M. A. (2002). Sex, lies, and war: How soft news brings foreign policy to the inattentive public. *American Political Science Review, 96*(1), 91–109. https://doi.org/10.1017/S0003055402004252

Benoit, K., Watanabe, K., Wang, H., Nulty, P., Obeng, A., Müller, S., & Matsuo, A. (2018). quanteda: An R package for the quantitative analysis of textual data. *Journal of Open Source Software, 3*(30), Article 774. https://doi.org/10.21105/joss.00774

Bode, L. (2016). Political news in the news feed: Learning politics from social media. *Mass Communication and Society, 19*(1), 24–48. https://doi.org/10.1080/15205436.2015.1045149

Bode, L., & Becker, A. B. (2018). Go fix it: Comedy as an agent of political activation. *Social Science Quarterly, 99*(5), 1572–1584. https://doi.org/10.1111/ssqu.12521

Bollen, K. A., & Diamantopoulos, A. (2015). In defense of causal-formative indicators: A minority report. *Psychological Methods, 22*(3), 581–596. https://doi.org/10.1037/met0000056

Chung, H., & Zhao, X. (2003). Humour effect on memory and attitude: Moderating role of product involvement. *International Journal of Advertising, 22*(1), 117–144. https://doi.org/10.1080/02650487.2003.11072842

Darke, P. R., Chaiken, S., Bohner, G., Einwiller, S., Erb, H.-P., & Hazlewood, J. D. (1998). Accuracy motivation, consensus information, and the law of large numbers: Effects on attitude judgment in the absence of argumentation. *Personality and Social Psychology Bulletin, 24*(11), 1205–1215. https://doi.org/10.1177/01461672982411007

Darlington, R. B., & Hayes, A. F. (2017). *Regression analysis and linear models: Concepts, applications, and implementation. Methodology in the social sciences*. The Guilford Press.

Davis, J. L., Love, T. P., & Killen, G. (2018). Seriously funny: The political work of humor on social media. *New Media & Society, 20*(10), 3898–3916. https://doi.org/10.1177/1461444818762602

De Vreese, C. H., & Neijens, P. (2016). Measuring media exposure in a changing communications environment. *Communication Methods and Measures, 10*(2–3), 69–80. https://doi.org/10.1080/19312458.2016.1150441

Dimitrova, D. V., & Matthes, J. (2018). Social media in political campaigning around the world: Theoretical and methodological challenges. *Journalism & Mass Communication Quarterly, 95*(2), 333–342. https://doi.org/10.1177/1077699018770437

Eisend, M. (2009). A meta-analysis of humor in advertising. *Journal of the Academy of Marketing Science, 37*(2), 191–203. https://doi.org/10.1007/s11747-008-0096-y

Eveland, W. P. (2001). The cognitive mediation model of learning from the news. *Communication Research, 28*(5), 571–601. https://doi.org/10.1177/009365001028005001

Fox, J. (2003). Effect displays in R for generalised linear models. *Journal of Statistical Software, 8*(15), 1–27. https://doi.org/10.18637/jss.v008.i15

Gardner, M. P. (1985). Mood states and consumer behavior: A critical review. *Journal of Consumer Research, 12*(3), 281–300. https://doi.org/10.1086/208516

Heiss, R., & Matthes, J. (2016). Mobilizing for some: The effects of politicians' participatory Facebook posts on young people's political efficacy. *Journal of Media Psychology, 28*(3), 123–135. https://doi.org/10.1027/1864-1105/a000199

Heiss, R., & Matthes, J. (2019). Does incidental exposure on social media equalize or reinforce participatory gaps? Evidence from a panel study. *New Media & Society, 21*(11–12), 2463–2482. https://doi.org/10.1177/1461444819850755

Heiss, R., & Matthes, J. (2021). Funny cats and politics: Do humorous context posts impede or foster the elaboration of news posts on social media? *Communication Research, 48*(1), 100–124. https://doi.org/10.1177/0093650219826006

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). Guilford Press.

Huddy, L., & Khatib, N. (2007). American Patriotism, national identity, and political involvement. *American Journal of Political Science, 51*(1), 63–77. https://doi.org/10.1111/j.1540-5907.2007.00237.x

Junco, R. (2013). Comparing actual and self-reported measures of Facebook use. *Computers in Human Behavior, 29*(3), 626–631. https://doi.org/10.1016/j.chb.2012.11.007

Karnowski, V., Kümpel, A. S., Leonhard, L., & Leiner, D. J. (2017). From incidental news exposure to news engagement. How perceptions of the news post and news usage patterns influence engagement with news articles encountered on Facebook.

Computers in Human Behavior, 76, 42–50. https://doi.org/10.1016/j.chb.2017.06.041

Keib, K., Espina, C., Lee, Y.-I., Wojdynski, B. W., Choi, D., & Bang, H. (2018). Picture this: The influence of emotionally valenced images on attention, selection, and sharing of social media news. *Media Psychology, 21*(2), 202–221. https://doi.org/10.1080/15213269.2017.1378108

Kim, Y., Chen, H.-T., & Gil de Zúñiga, H. (2013). Stumbling upon news on the Internet: Effects of incidental news exposure and relative entertainment use on political engagement. *Computers in Human Behavior, 29*(6), 2607–2614. https://doi.org/10.1016/j.chb.2013.06.005

Knoll, J., Matthes, J., & Heiss, R. (2020). The social media political participation model: A goal systems theory perspective. *Convergence, 26*(1), 135–156. https://doi.org/10.1177/1354856517750366

Kruglanski, A. W., Jasko, K., Chernikova, M., Milyavsky, M., Babush, M., Baldner, C., & Pierro, A. (2015). The rocky road from attitudes to behaviors: Charting the goal systemic course of actions. *Psychological Review, 122*(4), 598–620. https://doi.org/10.1037/a0039541

Krugman, H. E., & Hartley, E. L. (1970). Passive learning from television. *Public Opinion Quarterly, 34*(2), 18–190. https://doi.org/10.1086/267788

Kruikemeier, S., Van Noort, G., & Vliegenthart, R. (2016). The effect of website interactivity on political involvement. *Journal of Media Psychology, 28*(3), 136–147. https://doi.org/10.1027/1864-1105/a000200

Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication, 50*(1), 46–70. https://doi.org/10.1111/j.1460-2466.2000.tb02833.x

Matthes, J. (2013). Elaboration or distraction? Knowledge acquisition from thematically related and unrelated humor in political speeches. *International Journal of Public Opinion Research, 25*(3), 291–302. https://doi.org/10.1093/ijpor/edt005

McLaughlin, G. H. (1969). SMOG grading – a new readability formula. *Journal of Reading, 12*(8), 639–646.

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide. Communication, society and politics*. Cambridge University Press. https://doi.org/10.1017/CBO9781139164887

Park, N., Kee, K. F., & Valenzuela, S. (2009). Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *Cyberpsychology, Behavior and Social Networking, 12*(6), 729–733. https://doi.org/10.1089/cpb.2009.0003

Park, N., & Lee, S. (2014). College students' motivations for Facebook use and psychological outcomes. *Journal of Broadcasting & Electronic Media, 58*(4), 601–620. https://doi.org/10.1080/08838151.2014.966355

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology, 19*, 123–205. https://doi.org/10.1016/S0065-2601(08)60214-2

Postman, N. (1986). *Amusing ourselves to death: Public discourse in the age of show business*. Viking Penguin, Elisabeth Sifton books.

Prior, M. (2005). News vs. entertainment: How increasing media choice widens gaps in political knowledge and turnout. *American Journal of Political Science, 49*(3), 577–592. https://doi.org/10.1111/j.1540-5907.2005.00143.x

Prior, M. (2010). *Post-broadcast democracy: How media choice increases inequality in political involvement and polarizes elections. Cambridge studies in public opinion and political psychology*. Cambridge University Press.

Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: A comparison of facebook and instant messaging. *Bulletin of Science, Technology & Society, 30*(5), 350–361. https://doi.org/10.1177/0270467610380009

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Rothmund, T., & Otto, L. (2016). The changing role of media use in political participation. *Journal of Media Psychology, 28*(3), 97–99. https://doi.org/10.1027/1864-1105/a000204

Shah, D. V., Cho, J., Nah, S., Gotlieb, M. R., Hwang, H., Lee, N.-J., Scholl, D. M., & McLeod, D. M. (2007). Campaign ads, online messaging, and participation: Extending the communication mediation model. *Journal of Communication, 57*(4), 676–703. https://doi.org/10.1111/j.1460-2466.2007.00363.x

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83*(6), 1261–1280. https://doi.org/10.1037//0022-3514.83.6.1261

Suls, J. (1983). Cognitive Processes in humor appreciation. In P. E. McGhee & J. H. Goldstein (Eds.), *Handbook of humor research: Volume 1: Basic issues* (Vol. 56, pp. 39–57). Springer. https://doi.org/10.1007/978-1-4612-5572-7_3

Tam, K. Y., & Ho, S. Y. (2005). Web personalization as a persuasion strategy: An elaboration likelihood model perspective. *Information Systems Research, 16*(3), 271–291. https://doi.org/10.1287/isre.1050.0058

Theocharis, Y., & Quintelier, E. (2016). Stimulating citizenship or expanding entertainment? The effect of Facebook on adolescent participation. *New Media & Society, 18*(5), 817–836. https://doi.org/10.1177/1461444814549006

Thorson, K. (2014). Facing an uncertain reception: Young citizens and political interaction on Facebook. *Information, Communication & Society, 17*(2), 203–216. https://doi.org/10.1080/1369118X.2013.862563

Thorson, K., & Wells, C. (2016). Curated flows: A framework for mapping media exposure in the digital age. *Communication Theory, 26*(3), 309–328. https://doi.org/10.1111/comt.12087

Valeriani, A., & Vaccari, C. (2016). Accidental exposure to politics on social media as online participation equalizer in Germany, Italy, and the United Kingdom. *New Media & Society, 18*(9), 1857–1874. https://doi.org/10.1177/1461444815616223

Van Aelst, P., Strömbäck, J., Aalberg, T., Esser, F., de Vreese, C., Matthes, J., Hopmann, D., Salgado, S., Hubé, N., Steôpińska, A., Papathanassopoulos, S., Berganza, R., Legnante, G., Reinemann, C., Sheafer, T., & Stanyer, J. (2017). Political communication in a high-choice media environment: A challenge for democracy? *Annals of the International Communication Association, 41*(1), 3–27. https://doi.org/10.1080/23808985.2017.1288551

Wirth, W., Schemer, C., & Matthes, J. [Jörg] (2010). Trivializing the news? Affective context effects of commercials on the perception of television news. *Mass Communication and Society, 13*(2), 139–156. https://doi.org/10.1080/15205430903128924

Young, D. G. (2008). The Privileged role of the late-night joke: exploring humor's role in disrupting argument scrutiny. *Media Psychology, 11*(1), 119–142. https://doi.org/10.1080/15213260701837073

Zillmann, D., Williams, B. R., Bryant, J., Boynton, K. R., & Wolf, M. A. (1980). Acquisition of information from educational television programs as a function of differently paced humorous inserts. *Journal of Educational Psychology, 72*(2), 170–180. https://doi.org/10.1037/0022-0663.72.2.170

Zukin, C., & Snyder, R. (1984). Passive learning: When the media environment is the message. *Public Opinion Quarterly, 48*(3), 629–639. https://doi.org/10.1086/268864

ORCID

Raffael Heiss
iD https://orcid.org/0000-0002-8744-0871

Raffael Heiss
Center for Social & Health Innovation
Management Center Innsbruck
Universitätsstraße 15
6020 Innsbruck
Austria
raffael.heiss@mci.edu

Raffael Heiss (PhD, University of Vienna) is a lecturer and postdoctoral researcher at the Management Center Innsbruck. His research interests include digital media, political communication, and civic engagement.

Appendix

Stimulus Material and Additional Analysis

INNENPOLITIK | Online

Neues Studiengebühren-Modell soll rasch umgesetzt werden

ÖVP-FPÖ Regierung will rasche Einführung von Studiengebühren. Geplant sind außerdem Sondergebühren für schwache Studienleistungen.

Bildungsminister Faßmann (ÖVP) kündigte gestern im ORF die fixe Einführung von Studiengebühren an. Neben einer Pauschale für alle Studierenden will ÖVP-FPÖ künftig auch „Straf-Gebühren" für Studierende einheben, die ihr Studium nicht leistungsgerecht absolvieren. Sprich: Jeder „Fünfer" kostet, „schlechte" Studenten müssen zahlen.

Konkret soll die neue Regelung bereits Ende 2018 in Gesetzesform erscheinen und damit auch umgehend in Kraft treten. FPÖ-Bildungssprecher Krauss meinte, „wenn alles so läuft wie geplant, kann ich mir eine Einführung der neuen Regelung mit Wintersemester 2018/2019 vorstellen".

ÖVP-FPÖ einig

Faßmann machte auf „Kurier" - Anfrage deutlich: „Innerhalb der Koalition herrscht zu diesem Thema breiter Konsens. Auch die Studierenden sollen in Zukunft einen Beitrag leisten." Konkret soll sich der Betrag zwischen 400 und 500 Euro pro Semester bewegen. Allerdings können die Gebühren für Studierende steigen, wenn diese zu wenig ETCS Punkte pro Semester absolvieren und dadurch die Gesamtstudienzeit verzögern.

Wie ist die Rechtslage?

Eine schnelle Annullierung der existierenden Regelung sei für die Regierung auf normalem Gesetzesweg schwierig, meint Andrea Ulmer, Lehrbeauftrage für Wissenschafts- und Bildungsrecht am Juridicum Wien. Allerdings können sich FPÖ-ÖVP eine gesetzliche Hintertür zu Nutzen machen. So stehe es ihnen etwa frei, „per Dekret die entsprechende Gesetzesänderung durchzuführen", so Ulmer. Eine ausgearbeitete Vorlage für ein solches Dekret liegt bereits vor.

Translation:
Title: New tuition model should be implemented quickly

Subtitle: ÖVP-FPÖ government will introduce of tuition fees and plans special fees for weak study achievements.

Yesterday, Minister Faßmann (ÖVP) announced the introduction of tuition fees on the Austrian Public TV. In addition to the fee for all students, the government will also levy "penalty fees" for students who do not complete their studies in accordance with their performance requirements. In other words: "bad" students have to pay additional fees for their failed courses.
The new regulation is planned to be introduced in late 2018 already. FPÖ education speaker Krauss said, "if everything goes as planned, I can imagine an introduction to the new regulation for the winter semester 2018/2019".

ÖVP-FPÖ agree
As reported in the newspaper "Kurier", Faßmann said: "Within the coalition there is broad consensus on this issue. In the future, all students will contribute with their payments." Specifically, the amount will be between 400 and 500 Euros per semester. However, this base fee may increase in case students do not complete a minimum of credits per semester.

The legal situation
According to Andrea Ulmer, expert in educational law at the University of Vienna, the introduction of the law through conventional processes might be difficult. However, the government can make use of a legal backdoor. They can "implement the necessary changes using a decree", said Ulmer. An elaborated model for such a decree has already been prepared.

Figure A1. News text which appeared in the high involvement condition. Note that the low involvement text (control condition) appeared in the same layout and length, but dealt with an unrelated political topic (results of central high school examination results).

ÖH Uni Wien
Vor 2 Std.

Wir sprechen uns klar gegen die
Einführung von Studiengebühren aus.
Sozial schwächere Schichten dürfen
in Bildungsfragen nicht benachteiligt
werden. Sollte die Regierung ihre
Vorhaben umsetzen, werden wir
uns dennoch bemühen, um auch
Studierenden aus sozial schwächeren
Schichten die weitere Ausbildung zu
ermöglichen. Bis es dazu kommt werden
wir jedoch alles daran setzen, die
geplante Einführung zu verhindern und
bereiten bereits eine Petition gegen die
Regierungspläne vor!

Translation:

We are clearly against the introduction of tuition fees.
Students should not have disadvantages because of
their social class. However, if the government will go
on with their plans, we will do our best to support
affected students so that they can continue their
education programs. Before that, we will do
everything to prevent the introduction of the fees and
are already planning a petition against it!

Figure A2. Example: One of the three political posts which appeared in the newsfeeds.

Pferde
14. April

Mit dir an meiner Seite
17. Mai um 07:30

**WENN DU VERSUCHST
MIT FREUNDEN EIN SELFIE
ZU MACHEN**

Translation (right):
When you try to make a selfie with friends

Figure A3. Example for a non-humorous (left, control condition) vs. a humorous (right) post.

Table A1. Pearson correlations among dependent variables

	1	2	3
1 General attention	1		
2 Elaboration of political posts	.61***	1	
3 Acquisition of political knowledge	.40***	.39***	1
4 Intended participation	.37***	.52***	.25***

Note. ***$p < .001$.

Table A2. Factor loadings from confirmatory factor analysis

Factor	Item	Standardized loading	SE
Attention	Item 1	.93	.02
Attention	Item 2	.92	.02
Attention	Item 3	.56	.04
Elaboration	Item 1	.87	.02
Elaboration	Item 2	.67	.04
Elaboration	Item 3	.86	.02
Elaboration	Item 4	.76	.03
Participation	Item 1	.75	.03
Participation	Item 2	.60	.04
Participation	Item 3	.46	.05
Participation	Item 4	.69	.04
Participation	Item 5	.69	.04
Participation	Item 6	.64	.04

Table A3. OLS regression results with attention and elaboration included in the models

	Acquisition of political knowledge b (SE)	Intended political participation b (SE)
Age	−0.004 (0.03)	−0.02 (0.02)
Man	0.22 (0.20)	−0.49*** (0.14)
College degree	0.01 (0.25)	−0.13 (0.17)
Political interest	0.17[+] (0.09)	0.10[+] (0.06)
Social media use	−0.09 (0.06)	0.001 (0.04)
Entertainment motivation	−0.05 (0.07)	−0.04 (0.05)
Political motivation	−0.04 (0.09)	0.12* (0.06)
Humor/HI[a]	0.23 (0.26)	0.45* (0.18)
No humor/HI[a]	0.35 (0.26)	0.06 (0.19)
Humor/LI[a]	0.48[+] (0.25)	−0.21 (0.17)
Attention	0.28*** (0.07)	0.09[+] (0.05)
Elaboration	0.17* (0.08)	0.28*** (0.06)
Constant	0.86 (0.99)	1.52* (0.70)
Observations	286	286
Adjusted R^2	0.21	0.35

Note. [a]Reference category = no humor/LI; HI = high involvement; LI = low involvement. [+]$p < .1$; *$p < .05$; ***$p < .001$.

Original Article

Exaggerated and Questioning Clickbait Headlines and Their Influence on Media Learning

Nick Carcioppolo[1] , Di Lun[1], and Soroya Julian McFarlane[2]

[1]Department of Communication Studies, University of Miami, Coral Gables, FL, USA
[2]Department of Communication Studies, University of Georgia, Athens, GA, USA

Abstract: Headlines that are incongruous with article content can negatively impact media learning outcomes. Clickbait headlines intentionally misrepresent news content, often in sensational ways to increase click-throughs and ad revenue. To evaluate the impact of clickbait headlines on media learning and article-related beliefs, we conducted two online experiments, each testing a 3 (headline-type: accurate, clickbait-question, clickbait-exaggerated) × 2 (exposure: headline-only, full article) factorial. In Study 1, an online sample of US adults ($N = 629$) was randomly assigned to one of six news message conditions. Study 2 ($N = 1,674$) was a replication study across three news contexts and testing a mediator to explain how exposure to a clickbait headline can influence learning. Key results suggest that reading the full article with an accurate headline resulted in the highest recognition and comprehension, and reading correcting information within an article is likely not enough to overcome the deleterious impact of a clickbait headline. Theoretical and practical recommendations are discussed.

Keywords: cognitive mediation model, cancer news learning, clickbait

Headlines that are incongruent with article can increase perceptions of scientific uncertainty and result in the formation of attitudes and beliefs that are inconsistent with the article content (Ecker et al., 2014; Geer & Kahn, 1993; Pfau, 1995). Unfortunately, incongruous headlines are commonly utilized in online news coverage, a practice known as "click baiting." Clickbait is colloquially defined as imprecise or sensationalist headlines to attract an audience. Most clickbait headlines are irksome but innocuous, however, there are at least two potentially problematic forms that warrant further research: (1) *questioning headlines*, which pose a question subsequently answered in the article (e.g., "Does green tea extract cause liver damage?"); and (2) *exaggerated headlines*, which overstate scientific findings through embellishment, hyperbole, or a lack of qualifying information, such as, "White wine has a scary link to skin cancer." Clickbait headlines are one principal driver of fake news online, they are intentionally misleading and often not fully corrected within article content (Silverman, 2015). Indeed, even when incongruous headlines are corrected within the article, lingering effects of misinformation remain (Ecker et al., 2014). This is due in large part to the advance organizer effect, which posits that content presented in advance of a presentation (e.g., a headline or a news tease) provides an ideational scaffolding or a general structure that guides the retention of later information

(Ausubel et al., 1978). The purposeful obfuscation or misrepresentation of news content can yield problematic outcomes in a variety of contexts, including, but not limited to science communication, where an incongruous headline may result in health-related beliefs that are unsupported by scientific findings; risk communication, where incongruous headlines lead to inaccurate risk perceptions; and of course, journalism, where clickbait headlines can have problematic effects on article understanding and publication reputation.

In the present investigations, two studies are conducted to identify and verify the influence of clickbait in multiple contexts, including environmental news, science news, and two different types of health news: cancer and HIV. Although incongruent headlines can impact attitude formation (Andrew, 2007), it seems plausible that clickbait headlines could have either beneficial or detrimental effects on both proximal and distal attitudes and beliefs that may inform risk perceptions and subsequent decision-making. For instance, a headline that dramatically overstates cancer risk may increase perceived susceptibility to cancer, ultimately leading to the adoption of prevention behaviors. Conversely, a dramatic overstatement of cancer risk may conflict with other news content, a known indicator of information overload that reduces the likelihood of taking preventive actions. Considering this, the overarching research questions for this study are as follows: (1) How

do clickbait headlines influence understanding?; (2) As most readers spend more time reading headlines than articles (Dor, 2003), does exposure to only the headline or full article impact understanding?; and (3) Is there an interaction between headline-type and article exposure on understanding? We use the cognitive mediation model as a guiding theoretical framework to design and test a 3 (headline type: clickbait-questioning, clickbait-exaggerated, accurate) × 2 (article length: headline-only, full article) factorial design across two online experimental studies assessing how clickbait news content influences two indicators of media learning: recognition and comprehension. We also assess two secondary outcomes, perceptions of susceptibility and information overload, as well as elaboration as a potential mediator in Study 2.

Literature Review

The purpose of a headline is to summarize the main idea of an article, allowing readers to choose which articles to read among a large number of choices (Ecker et al., 2014). Effective headlines provide accurate article summaries while minimizing processing effort (Dor, 2003). Clickbait headlines are not accurate article summaries. While there is no scholarly consensus on a conceptual definition of clickbait, most agree that clickbait headlines are short, often sensationalist content that entices readers to click the article link (Potthast et al., 2016; Shire, 2014).

Clickbait headlines are often modified to appear more negative than the actual article, exaggerate main points, or over-emphasize conflicts to attract more readers (Ecker et al., 2014). This strategy has been used profitably for decades by publications like the *National Enquirer*, and more recently online through outlets like *Buzzfeed*, *IFLScience*, and *Lifehacker*, where journalists have a financial imperative to increase online readership, as advertising revenue is based explicitly on page views (Farhi, 2008). This financial pressure increases the likelihood that a website would distort the veracity of a headline to increase ad revenue. When journalists, bloggers, and other web content creators misrepresent message content, it can dramatically influence learning outcomes of message exposure.

Cognitive Mediation Model
The cognitive mediation model describes the process through which media learning occurs (Ho et al., 2013; Jensen, 2011). The model proposes that we learn from news through a process known as surveillance motivation, or an intrinsic ambition to learn, which happens through increased attention to news and elaboration on content (Eveland, 2001). One obvious problem of clickbait headlines arises for those who read only the headline, making it impossible to elaborate on any correcting information

within the article. Since most readers spend more time reading headlines than full articles (Dor, 2003), they may not read through article content to correct exaggerated headlines, and even if they did, incongruent headlines hold lingering effects. As an example, a recent investigation explored how altering headlines to focus on secondary content stated within the article rather than the overall thrust of the article impacted message recall, finding that participants exposed to an article with an incongruent headline were less likely to remember key facts about that article than those exposed to an article with an accurate headline (Ecker et al., 2014). In short, clickbait headlines can present distorted versions of the truth that limit one's ability to process and contextualize a news story. In the present study, attention is manipulated through exposure to the headline-only (low attention) or exposure to the full article (high attention).

The principal outcome variable of the cognitive mediation model is learning. In past studies, this has been commonly operationalized as knowledge (e.g., Eveland, 2001). However, measures of knowledge may be inappropriate in the context of clickbait headlines, where the truth is often stretched or distorted. Other cognitive mediation model studies have operationalized learning through measures of recognition and comprehension (e.g., Jensen, 2011). These measures may be more appropriate in the context of clickbait, as they distinguish between being able to recall article content (recognition) and applying that content to make accurate attributions in other contexts (comprehension). In traditional journalistic practices, headlines and article content are congruent, meaning that both recognition and comprehension can be achieved solely through engaging with the article. However, in clickbait articles, headline and article content are incongruent, where headline recognition may lead to faulty comprehension, as headline content informs processing over any correcting information found in the article (Van Dijk, 1988).

Considering the uncertainty, confusion, and misinformation caused by clickbait headlines, the following hypotheses are proposed:

Hypothesis 1 (H1): Clickbait headline framing (exaggeration, questioning) will yield lower scores on recognition (H1a) and comprehension (H1b) than reading accurate headline framing.

Hypothesis 2 (H2): Reading only the headline will yield lower scores on recognition (H2a) and comprehension (H2b) than reading the entire article.

Hypothesis 3 (H3): The effect of clickbait headlines on recognition (H3a) and comprehension (H3b) will be stronger when participants only read the headline as opposed to the full article.

Clickbait Headlines and Health-Related Beliefs

Two types of clickbait that can have deleterious outcomes for disease prevention and screening are posing questions and exaggeration. Questioning headlines are perceived as confusing and less informative (Kuiken et al., 2017). For instance, "Is mammography the best screening test to identify breast cancer?" can elicit doubt, regardless of the answer to this question. Exaggerated headlines can be similarly problematic. They often contain provocative or misleading words that overstate scientific findings and elicit confusion, anxiety, and in some cases medical nonadherence (Biyani et al., 2016; Brunt et al., 2003; Schwartz & Woloshin, 2003). Specifically, exaggeration may contribute to one of two outcomes: (1) a gross overestimation of risk leading to risk perceptions in excess of actual risk probabilities; or perhaps worse, (2) disbelief in the sheer extremity of the exaggeration that leads one to reappraise their beliefs and reduce risk perceptions (Adams et al., 2017). The first case, although yielding potentially inflated risk perceptions, may be helpful as exaggeration can increase perceptions of susceptibility, which is associated with the adoption of preventive health behaviors (Witte & Allen, 2000). In contrast, the second case demonstrates the negative effects of exaggeration, where exaggerated findings may reduce risk perceptions through disbelief.

Exaggerated headlines may also increase perceptions of information overload, especially if the exaggerated claim conflicts with existing cognitive representations. For instance, it is not uncommon to see news articles portraying either the cancer-preventive or cancer-causing influence of red wine. Headlines exaggerating the connection between a common food and cancer incidence or cancer prevention may increase perceptions of information overload by eliciting confusion and uncertainty.

Given that clickbait may have either positive or negative impacts on the enactment of cancer prevention outcomes, the following research questions are advanced:

Research Question 1 (RQ1): Are there relationships between headline framing and message length on perceptions of disease susceptibility?

Research Question 2 (RQ2): Are there relationships between headline framing and message length on perceptions of information overload?

Study 1

Method

A 3 × 2 factorial experiment with random assignment to condition was employed to assess the impact of headline framing (accurate, questioning, exaggerated) and message length (headline-only, full article) on perceptions of disease susceptibility and information overload as well as two dimensions of knowledge: recognition and comprehension. Specifically, we focus on whether and how cancer-related clickbait headlines affect cancer information overload.

Participants and Procedure

Eligibility criteria were restricted to US residents 18 years or older who read online news. Participants ($N = 630$) were recruited using Qualtrics' panel service, weighting responses on US census data for age and race/ethnicity. On average, participants were 46.57 years ($SD = 16.32$; range 18–85), female (77%), and Caucasian/White (62%). Other races/ethnicities included in the sample were Latino/Hispanic (16.8%), African American/Black (13.2%), Asian/Pacific Islander (5.4%), Native American/American Indian (0.6%), and those marked "other" (1.1%).

Data were collected using Qualtrics' panel service, employing a variety of marketing survey research outlets to reach a broad cross-section of the US online population. Eligible participants were directed to the survey where they completed informed consent, were randomized to one of the six study conditions, read through the stimulus message, and completed a posttest survey measuring attitudes, beliefs, as well as knowledge measures about the article.

Stimuli

Six intervention conditions were created from an original article published on the Cosmopolitan magazine website (Narins, 2016). The article was shared over 400 times directly from the Cosmopolitan website, likely more when taking into account secondary shares, including Facebook shares, tweets, and retweets. The article features a clickbait headline about the relationship between white wine and skin cancer: "White wine has a scary link to skin cancer." In truth, the research findings upon which this article is based report a modest increase in skin cancer incidence among those who drink more white wine than other types of spirits (Rivera et al., 2016). The original article headline was used as the exaggeration condition headline. We slightly edited the article content to provide an accurate summary of the original research article, which was omitted from the news story. Headlines for the questioning and accurate condition were modified from this headline (see online supplementary content for the stimulus message at https://drive.google.com/file/d/137z3gMTMgTcUwVuK30 PpFO36P3jwcL8Y/view?usp=sharing). Article length was manipulated by showing participants the headline-only or the full article.

Measures

Four dependent variables were measured in this study: recognition, comprehension, information overload, and perceived susceptibility. *Recognition* and *comprehension* items were modified from a previous study (Jensen, 2011).

Recognition items measured rote memorization and comprehension items measured participants' ability to apply knowledge from the article to another situation. An index was created for both variables by summing correct responses. Both indexes contained three questions measuring knowledge about the article, each with four response options, one of which was correct. Scores on both indexes were on a 4-point scale ranging from 0 to 3, representing zero correct answers through 3 correct answers (M_{rec} = 1.68; SD_{rec} = 1.10; M_{comp} = 1.60; SD_{comp} = 0.98). An example of a recognition item is: "In general, drinking any type of alcohol is associated with a _____ increase in skin cancer risk compared to non-drinkers." An example of a comprehension question is: "David drinks a glass of white wine every day with dinner. David is at _____ risk of getting skin cancer compared to people who drink other types of alcohol." *Cancer information overload* was conceptualized as feeling overwhelmed by the sheer amount of cancer information and was taken from an 8-item, reliable, and validated scale with seven response options ranging from *strongly disagree* to *strongly agree* (Jensen et al., 2014; M = 4.02, SD = 1.14; α = .86). A sample item from the cancer information overload scale is: "There are so many different recommendations about preventing cancer, it's hard to know which ones to follow." *Perceived susceptibility* to skin cancer was modified to ask specifically about perceived susceptibility related to one's own white wine consumption and was measured by modifying a 3-item, previously validated scale measured on a scale with seven response options ranging from 1 = *strongly disagree* to 7 = *strongly agree* (Witte, 1996; M = 2.21, SD = 1.55; α = .93). A sample item is: "I am at risk for getting skin cancer because I drink a lot of white wine."

Results

Data were analyzed using two-way analysis of variance (ANOVA) in SPSS. Headline framing and message length were entered as the independent variables. Four models were specified, one for each dependent variable including recognition, comprehension, information overload, and susceptibility. H1a, H2a, and H3a were tested within the same model looking at the main effects of headline framing (H1a) and message length (H2a), as well as their interaction (H3a) on recognition. There was a significant main effect of message length on recognition, $F(1, 624)$ = 30.39; p < .001, η^2 = .05, such that those who read the entire article had higher recognition scores, in support of H2a. Although the main effect for headline framing was nonsignificant, $F(2, 624)$ = 1.47; p = .230, η^2 = .01, this finding was qualified by a significant interaction effect between headline framing and message length on recognition, $F(2, 624)$ = 7.44; p = .001,

η^2 = .02. Specifically, the question/headline-only condition generated significantly lower recognition scores than the question/full article condition (M_{diff} = −0.67, SE = .15, p < .001). That is, the negative impact of questioning headlines was stronger when participants only read the headlines than the full article. Interestingly, this effect was not observed among exaggerated headlines; the exaggeration/headline-only condition generated similar recognition scores to the exaggeration/full article condition (M_{diff} = −0.01, SE = .15, p = .942). Additionally, the accurate/full article condition generated significantly higher recognition scores than the accurate/headline-only condition (M_{diff} = 0.73, SE = .15, p < .001), and the accurate/full article condition resulted in the highest levels of recognition. In other words, when the headlines were accurate or in questioning-clickbait formats, the effect was stronger when participants only read the headlines. The effect of exaggerated headlines did not differ by message length. Taken together, H3a was partially supported. All conditional means and standard deviations can be seen in Table 1.

H1b, H2b, and H3b were tested within the same model looking at the main effects of headline framing (H1b) and message length (H2b), as well as their interaction (H3b) on comprehension. There was a significant main effect of message length on comprehension, $F(1, 623)$ = 23.94; p < .001, η^2 = .04, such that those who read the entire article had higher comprehension scores, in support of H2b. The main effect for headline framing was marginally significant, $F(2, 623)$ = 2.79; p = .06, η^2 = .01. Post hoc comparisons were assessed using Tukey's *HSD* test, revealing significant mean differences between the exaggerated and questioning headline conditions, M_{diff} = 0.22, SE = 0.09, p = .04, and a marginally significant difference between the accurate and questioning headline conditions, M_{diff} = 0.21, SE = 0.10, p = .07. These results demonstrate that the questioning headline generally resulted in the lowest comprehension. However, as H1b hypothesized that the accurate framing condition would result in the highest comprehension, this hypothesis was not supported. There was not a significant interaction effect, $F(2, 623)$ = 0.06; p = .94, η^2 = .00.

Additionally, we explored contrasts in ANOVA to compare the mean differences between (a) accurate headline condition versus the clickbait headline conditions and (b) the question headline versus the exaggerated headline among those who were assigned to read the full article. This analysis investigated whether correcting information within the article could ameliorate the negative influence of clickbait headlines. In the first contrast, the clickbait headlines elicited significantly lower recognition scores than the accurate headline, $t(310)$ = 2.63, p = .009, which further supports H3a. No significant differences between exaggerated and questioning clickbait headlines was found, $t(310)$ = 1.43, p = .15. Clickbait and accurate headlines

Table 1. Conditional means for all dependent variables (DV) in Study 1

	Accurate			Question			Exaggerate			Total		
	M	SD	n	M	SD	n	M	SD	n	M	SD	n
DV: Recognition												
Headline-only	1.39	1.19	93	1.25	1.16	114	1.71	1.13	110	1.45	1.17	317
Full article	2.12	0.92	112	1.91	1.00	94	1.72	0.98	107	1.92	0.98	313
Total	1.79	1.11	205	1.55	1.14	208	1.71	1.06	217	1.68[a]	1.10	630
DV: Comprehension												
Headline-only	1.47	1.00	93	1.29	0.89	114	1.48	0.88	109	1.41	0.92	316
Full article	1.82	0.95	112	1.66	1.04	94	1.89	1.02	107	1.80	1.01	313
Total	1.66	0.99	205	1.46	0.98	208	1.68	0.97	216	1.60[a]	0.98	629
DV: Susceptibility												
Headline-only	2.27	1.50	93	2.01	1.35	114	2.17	1.58	110	2.14	1.47	317
Full article	2.24	1.63	112	2.39	1.67	94	2.22	1.59	107	2.28	1.63	313
Total	2.25	1.57	205	2.18	1.51	208	2.20	1.58	217	2.21[a]	1.55	630
DV: CIO												
Headline-only	3.91	1.04	93	4.19	1.20	114	4.26	1.26	110	4.13	1.18	317
Full article	3.89	1.04	112	3.94	1.13	94	3.89	1.11	107	3.91	1.09	313
Total	3.90	1.03	205	4.08	1.17	208	4.08	1.20	217	4.02[a]	1.14	630

Note. [a]Geometric Mean.

https://econtent.hogrefe.com$[contentReq.requestUri] - Wednesday, May 01, 2024 10:23:54 PM - IP Address:52.14.126.74

elicited statistically similar comprehension scores, $t(310) = 0.40$, $p = .69$, hence H3b was not supported. There was no significant difference between the two types of clickbait headlines on comprehension, $t(310) = -1.61$, $p = .11$. Taken together, the contrasting results indicate that those who read the full article with clickbait headlines had lower recognition and but similar comprehension scores as those who read an accurate headline.

RQ1 asked about the interaction between headline framing and message length on perceived disease susceptibility. There was no significant interaction effect observed, $F(2, 624) = 1.02$; $p = .361$, $\eta^2 = .00$, and no main effect for headline framing, $F(2, 624) = 0.77$; $p = .92$, $\eta^2 = .00$, or for message length, $F(1, 624) = 1.23$; $p = .27$, $\eta^2 = .00$. Thus, no support for RQ2 was found.

The second research question asked about the interaction between headline framing and message length on perceptions of information overload. There was no significant interaction effect observed, $F(2, 624) = 1.28$; $p = .28$, $\eta^2 = .00$, and no main effect for headline framing, $F(2, 624) = 1.59$; $p = .20$, $\eta^2 = .01$. However, there was a significant main effect for message length, $F(1, 624) = 5.53$; $p = .02$, $\eta^2 = .01$. In general, information overload scores were higher when participants read only the headline and not the entire message.

Discussion

There was a significant interaction between headline framing and message length on recognition such that recognition was highest among people who read the accurate

headline and the full article, as predicted. Of note, among those who read the exaggerated headline, message length proved inconsequential. That is, even those who read the full article had virtually the same recognition scores as those who read only the headline. It appears that clickbait headlines employing exaggeration tactics leave such an effect on readers that even corrective information in the text cannot change initial impressions. The findings for comprehension were similar, but the interaction effect was only significantly different between the exaggerated and questioning clickbait conditions. In short, the lowest levels of comprehension occurred with exposure to the questioning headline without reading the full article. Although the effect size was small, it can nevertheless still be important (Durlak, 2009; Lakens, 2013); *Cosmopolitan* is published in 34 languages and more than 100 countries, making it one of the most widely recognized and distributed brands globally (Hearst, 2013), and online articles serve only to broaden that reach.

Concerning beliefs, message length was a significant predictor of information overload, where overload was higher among people who only read the headline. This has troubling practical implications for the saturated online media environment. It seems that people who encounter headlines about cancer news, regardless of clickbait strategies or headline congruency, may experience higher perceptions of information overload. There were no significant main effects or interaction effects witnessed for susceptibility. Taken together, it appears that clickbait headlines themselves may not influence protective or avoidance motivations, at least in the context of the two beliefs measured

in the present study: information overload and susceptibility.

Study 2

The findings from Study 1 are compelling but preliminary and limited in scope, focusing only on a cancer-related news article. To increase certainty in these findings and provide a broader argument for external validity, we propose a second study to assess the impact of clickbait headlines on susceptibility, recognition, and comprehension across three additional news contexts: science news, health news, and environmental news. In this study, we attempt to replicate Hypotheses 1–3 and RQ1 in Study 1. RQ2 is not relevant, as these news stories are not related to cancer.

An additional research question is posed to assess the process through which clickbait headlines impact news learning outcomes. The cognitive mediation model suggests two pathways to media learning: attention and elaboration. In each of the present studies, attention is manipulated through either exposure to a headline-only or the full article. The present study will assess elaboration on message content as a mediator of media learning outcomes, as the cognitive mediation model posits that increased elaboration facilitates media learning (Eveland, 2001). As such, the following research question is proposed:

> Research Question 3 (RQ3): Will elaboration mediate the relationship between the Headline × Length interaction and (RQ3a) recognition, (RQ3b) comprehension, and (RQ3c) susceptibility?

Method

A similar design to Study 1 was employed, a 3 × 2 factorial experiment with random assignment to condition to assess the impact of headline framing (accurate, questioning, exaggerated) and message length (headline-only, full article) on perceptions of susceptibility and two dimensions of knowledge: recognition and comprehension. Three different news contexts (articles on science, health, and the environment) were used to assess the effect of clickbait headlines across various news contexts. Message context was entered as a covariate for all analyses. This study was preregistered prior to data collection on the Open Science Foundation website (see https://osf.io/5fev8).

Participants and Procedure

Eligibility criteria were restricted to US residents 18 years or older. Participants (N = 1,674) were recruited through Amazon's Mechanical Turk (mTurk). Although multiple investigations have demonstrated the utility and representativeness of mTurk samples (Berinsky et al., 2012; Casler et al., 2013; Hauser & Schwarz, 2016), there are nevertheless concerns when collecting data online that should be addressed to ensure data fidelity. To address these concerns, we took multiple measures. In total, we collected 2,094 responses. A pretest survey was conducted to assess eligibility criteria (ages 18+). Eighty-seven people were excluded from proceeding for failing to meet this age requirement. Next, to make sure people were investing adequate effort, we removed 59 cases from analysis for a response time that was less than $\frac{1}{3}$ of the median response time. We found no evidence of straight-liners or patterned responses. One hundred thirty cases were removed for failing the attention check item, and an additional 133 cases were removed for failing to provide an adequate answer for what the article/headline was about. Eleven cases were removed as univariate outliers. A total of 1,674 cases were used for data analysis. On average, participants were 40.16 years (SD = 13.06; range 18–83), female (54%; n = 920), and White (76.3%; n = 1278). Other races/ethnicities included in the sample were Latino/Hispanic (5.3%), African American/Black (9.6%), Asian/Pacific Islander (6.8%), Native American/American Indian (0.8%), and those who marked "other" (1.3%).

Stimuli

Three news articles were collected from *Time Magazine*, *Huffington Post*, and *The Independent* published between 2015 and 2019. Three different news contexts were chosen: (1) an environmental news article reporting on pollution in London and its health effects; (2) a science news article reporting on findings in psychology linking bitter taste preferences to antisocial personality traits; and (3) a health news article reporting on a recent study eliminating HIV in a test group of mice. The original article headline for each article was maintained as the exaggeration condition headline. We also generated two additional headlines (a questioning headline and an accurate headline) based on the article context to test the headline framing effect. The headlines used in the environmental news article were:

- "London air pollution cancels positive health effects of exercise in those over 60" [Accurate headline];
- "Pollution wipes out benefits of exercise, study suggests" [Exaggeration headline];
- "Does air pollution negate the health benefits of a long walk?" [Question headline]."

The exaggeration headline overstates scientific findings by suggesting that pollution counteracts the benefits of all exercise for all people, while the study found that pollution impacts elderly people who take long walks outside. The headlines used in the science news article were:

- "A recent study found bitter taste preferences as a predictor for Machiavellianism, psychopathy, narcissism, and everyday sadism" [Accurate headline];
- "How you drink your coffee could point to psychopathic tendencies" [Exaggeration headline];
- "Are bitter taste preferences linked to antisocial personality traits?" [Question headline]."

The exaggeration headline is a clear embellishment as the study found no significant link between any specific bitter food, such as coffee, beer, or grapefruit, and antisocial personality traits. The headlines used in the health news article were:

- "Researchers eliminated HIV in 30% of test mice" [Accurate headline];
- "For the first time, researchers eliminated HIV from the genomes of living animals" [Exaggeration headline];
- "Did researchers just eliminate HIV from the genomes of living animals?" [Question headline]."

The exaggeration headline overstates scientific findings by neglecting to report this finding was for a small percentage of a test case in mouse models. Message length was manipulated as headline-only or full article.

Measures

Three dependent variables were measured in Study 2: recognition, comprehension, and perceived susceptibility. *Recognition* and *comprehension* items were operationalized using three true or false questions for each construct. A sample recognition item is "Exposure to air pollution on city streets is enough to wipe out the benefits of exercise for most people." A sample comprehension item is "David enjoys bitter flavors and his brother Charles prefers sweets. David is more likely to display antisocial personality traits than Charles." Response options were *true*, *false*, and *I do not know*. Participants were given an *I do not know* option to reduce the likelihood of selecting the correct answer by chance. All responses of *I do not know* were coded as incorrect. An index was created for both variables by summing correct responses ranging from 0 to 3 ($M_{rec} = 1.61$; $SD_{rec} = 1.03$; $M_{comp} = 1.49$; $SD_{comp} = 1.00$). Similar to Study 1, *perceived susceptibility* was modified for each of the three context conditions ($\alpha = .92$), such as "My health is at risk because I [drink a lot of coffee/spend a lot of time outdoors]." *Elaboration* is conceptually defined as the number of unique thoughts that arise after exposure to the message. Following previous research, we operationally defined elaboration using 20 text entry boxes and asked participants to list any thoughts they had about the news article, limiting each entry to one thought (Cacioppo et al., 1979; $M = 8.26$, $SD = 6.23$). *Need for cognition* represents one's

tendency to engage in and enjoy thinking, operationally defined using Cacioppo and colleagues (1984) 18-item scale ($\alpha = .86$). The need for cognition was included as a covariate to account for any individual differences.

Results

H1, H2, and H3 addressed the main effect of headline framing (H1), the main effect of message length (H2), and their interaction effect (H3) on recognition (a) and comprehension (b). Two analyses of covariance (ANCOVAs) were conducted with recognition and comprehension as the dependent variables in each. Need for cognition and message context were included as planned covariates in our preregistered study. However, the need for cognition was not significantly related to any outcome variable and thus was dropped from all analyses. The results revealed a significant difference between headline types among recognition, $F(2, 1,668) = 32.64$, $p < .001$, $\eta^2 = .04$, where participants who were assigned to accurate condition had significantly higher recognition scores than those who were assigned to questioning ($M_{diff} = 0.42$, $SE = 0.06$, $p < .001$) and exaggeration conditions ($M_{diff} = 0.37$, $SE = 0.06$, $p < .001$). All conditional means and standard deviations can be seen in Table 2. Thus, H1a was supported. There was also a significant main effect for length, $F(1, 1,668) = 170.10$, $p < .001$, $\eta^2 = .09$, where those who read the full article reported higher recognition scores, in support of H2a. H3a specified that the effect of clickbait headlines on recognition will be stronger when participants only read the headline as opposed to the full article. The interaction effect between headline type and length was significant, $F(2, 1,668) = 6.36$, $p = .002$, $\eta^2 = .01$. A look at the simple effects confirm that recognition was highest in the full article/accurate headline condition compared to the full article/question condition ($M_{diff} = 0.26$, $SE = 0.08$, $p = .002$), full article/exaggeration condition ($M_{diff} = 0.19$, $SE = 0.08$, $p = .024$), and headline-only/accurate condition ($M_{diff} = 0.38$, $SE = 0.08$, $p < .001$). The lowest recognition scores were found in the headline-only exaggeration ($M = 1.13$, $SD = 0.06$) and question ($M = 1.10$, $SD = 0.06$) conditions. These findings lend support for H3a.

Consistent with H1b, accurate headlines also had a significant effect on comprehension, $F(2, 1,668) = 29.97$, $p < .001$, $\eta^2 = .04$, where participants who were assigned to accurate condition had significantly higher comprehension scores than those who were assigned to the questioning ($M_{diff} = 0.36$, $SE = 0.06$, $p < .001$) and exaggeration conditions ($M_{diff} = 0.39$, $SE = 0.06$, $p < .001$). Thus, H1b was supported. There was also a significant main effect for headline length, $F(1, 1,668) = 122.19$, $p < .001$, $\eta^2 = .07$, where those who read the full article reported higher comprehension scores ($M_{diff} = 0.51$, $SE = 0.05$, $p < .001$), in support of

Table 2. Conditional means for all dependent variables (DV) in Study 2

	Accurate			Question			Exaggerate			Total		
	M	SD	n	M	SD	n	M	SD	n	M	SD	n
DV: Recognition												
Headline-only	1.69	1.05	289	1.10	0.93	283	1.13	0.96	279	1.31	1.02	851
Full article	2.07	0.92	276	1.81	0.95	285	1.88	0.95	262	1.92	0.94	823
Total	1.87	1.00	565	1.45	1.01	568	1.49	1.02	541	1.60[a]	1.03	1,674
DV: Comprehension												
Headline-only	1.64	1.05	289	1.04	0.90	283	1.02	0.90	279	1.24	0.99	851
Full article	1.84	0.94	276	1.72	0.96	285	1.68	0.89	262	1.74	0.93	823
Total	1.74	1.00	565	1.38	0.99	568	1.34	0.95	541	1.49[a]	1.00	1,674
DV: Susceptibility												
Headline-only	2.66	1.63	289	2.76	1.61	283	2.74	1.58	279	2.72	1.61	851
Full article	2.51	1.54	276	2.77	1.60	285	2.69	1.59	262	2.66	1.58	823
Total	2.59	1.58	565	2.76	1.61	568	2.72	1.58	541	2.69[a]	1.59	1,674

Note. [a]Geometric Mean.

H2b. H3b specified that the effect of clickbait headlines on comprehension will be stronger when participants only read the headline as opposed to the full article. The interaction effect between headline type and length was significant, $F(2, 1,668) = 11.34$, $p < .001$, $\eta^2 = .01$. A look at the simple effects confirmed that although comprehension was highest in the full article/accurate headline condition, it was statistically equivalent to the full-article/question condition ($M_{diff} = 0.13$, $SE = 0.08$, $p = .12$). However, the full article/accurate headline condition was significantly more effective than the full-article/exaggeration condition ($M_{diff} = 0.17$, $SE = 0.08$, $p = .042$), and all headline-only messages (e.g., headline-only/accurate condition: $M_{diff} = 0.20$, $SE = 0.08$, $p < .012$). The lowest comprehension scores were found in the headline-only exaggeration ($M = 1.02$, $SD = 0.06$) and question ($M = 1.04$, $SD = 0.06$) conditions. These findings lend partial support for H3b.

To further probe this relationship, we conducted contrasts in ANOVA to compare only the mean differences in recognition and comprehension among those who were assigned to read the full article for (a) the accurate headline condition versus the clickbait headline conditions, as well as (b) the question headline versus the exaggerated headline. These contracts were not included in our preregistration. This analysis explored whether correcting information within the article could ameliorate the negative influences of clickbait headlines. In the first contrast, participants in the clickbait headline conditions reported significantly lower recognition than the accurate headline condition, $t(820) = 3.20$, $p = .001$, while no significant differences were observed between exaggerated and questioning clickbait headlines, $t(820) = -0.84$, $p = .402$. This pattern was also observed for comprehension scores. Clickbait headlines elicited lower comprehension scores than the

accurate headline, $t(820) = 2.11$, $p = .035$, and there was no difference between the two clickbait headline conditions, $t(820) = 0.51$, $p = .614$. Taken together, the results indicate that when reading the full article, clickbait headlines generally reduce message recognition and comprehension compared to the accurate headline. This finding lends support for H3a and H3b.

RQ1 examined the interaction effect between headline framing and message length on perceived susceptibility. Two-way ANCOVA was conducted with perceived susceptibility as the outcome and need for cognition and message context as covariates. There was no significant main effects for headline framing, $F(2, 1,668) = 1.87$, $p = .154$, $\eta^2 = .00$, message length, $F(1, 1,668) = 0.69$, $p = .407$, $\eta^2 = .00$, and the interaction effect was not significant, $F(2, 1,668) = 0.38$, $p = .682$, $\eta^2 = .00$. Thus, no evidence was found in support of RQ1.

RQ3 asked if elaboration would mediate the relationship between the Headline × Length interaction and (RQ3a) recognition, (RQ3b) comprehension, and (RQ3c) susceptibility. To address this Hayes' (2018) PROCESS (v3.4) custom dialog for SPSS was utilized specifying a linear regression equation with headline type entered as the primary predictor variable, length as the moderator, elaboration specified as a mediator of the interaction effect of headline Type × Length, and recognition, comprehension, and susceptibility as outcome variables in three separate analyses. Bootstrapping procedures were utilized to estimate a 95% confidence interval around the mediation coefficient with 10,000 resamples with replacement. There was no relationship between predictor variables and elaboration, no relationship between elaboration and any outcome (recognition, comprehension, susceptibility), and no evidence of moderated mediation in any analysis, Thus, we found no evidence to substantiate RQ3.

Discussion

In general, a similar pattern of results found in Study 1 was seen in Study 2 across three different message contexts: exposure to the accurate headline and reading the full article resulted in the most recognition and comprehension. Similar to Study 1, no relationship was observed between exposure to clickbait headlines and susceptibility. However, two important distinctions emerged: (1) when exposed to the full article, comprehension was higher across headline types than recognition, and (2) an investigation of simple effects revealed that among those who read the full article, recognition, and comprehension were significantly lower for those that read a clickbait headline than for those who read the accurate headline. These findings have important theoretical implications, addressed shortly in the general discussion. No evidence was found to support elaboration as a mediator in this process.

General Discussion

The present experimental study was conducted to understand the effect of clickbait headlines on learning outcomes in three different news contexts: science news, environmental news, and two different types of health news: cancer and HIV. These findings support previous research stating that headlines inconsistent with article content can result in reduced understanding (Ecker et al., 2014) and have multiple salient practical and theoretical implications. First, these results highlight the importance of message length on understanding. We live in an increasingly saturated digital information environment. News content is available and consumed across a variety of digital platforms, including news aggregator apps such as Feedly and Flipboard, link aggregator sites like Reddit, and social media sites including Facebook and Twitter. Exposure to hundreds of news headlines a day while using these services is not uncommon. Problems may arise when clickbait headlines are encountered; people who read just the clickbait headline likely believe it offers an adequate summary of the article content, and may consequently believe they understand article content. The results provided here suggest they generally have lower recognition and comprehension scores than those who receive accurate headlines.

These findings also suggest that clickbait journalistic practices have a tangible effect on consumers' ability to understand news content, which is critical for making informed decisions in a variety of contexts. Reading only clickbait headlines resulted in reduced ability to recognize the correct focus of a news article (recognition) and also the ability to apply the information in the article to a real-world setting (comprehension). This failure of understanding may

contribute to decision-making that has no grounding in scientific evidence. In line with this, Study 1 found that reading only a clickbait headline on cancer news can increase cancer information overload, which is associated with reduced attentiveness to health news, lower trust in health news, and reduced likelihood of adopting preventive health behaviors (Gurmankin & Viswanath, 2005; Han et al., 2007; Jensen et al., 2014; Kim et al., 2007; Niederdeppe & Gurmankin Levy, 2007). Further, in Study 2, we found that even among those who read the full article, recognition and comprehension scores were lower for those who received a clickbait headline than those who received an accurate headline. This suggests that reading the full article may not fully ameliorate the negative effects of clickbait. Recent work has identified a backfire effect of exposure to some clickbait headlines, finding that headlines presented in a questioning format negatively impact information seeking (Scacco & Muddiman, 2020). Coupled with our findings, this suggests that exposure to questioning headlines may reduce comprehension compared to accurate headlines and may reduce motivation to seek out further information on the topic.

There are also relevant theoretical applications. First, this investigation takes a novel approach in assessing the cognitive mediation model. Clickbait headlines do not conform to traditional models of media learning, which presuppose veracity of content and an implied relationship between recognition and comprehension where the ability to recall article content yields accurate comprehension of an issue. Instead, they introduce confusion and stretch the truth, reducing the likelihood that any correcting information found within the article is internalized. Counter to expectations results in Study 2 revealed that exposure to the full article led to higher comprehension scores than recognition scores. In opposition to this, much literature on learning posits accurate recognition as a precursor to comprehension (Gillund & Shiffrin, 1984). This suggests an alternative, unmeasured constructs may be influencing learning outcomes beyond the variables included in the cognitive mediation model. For instance, constructs such as prior clickbait experience, media literacy, and skepticism may all impact accurate comprehension in response to clickbait headlines. Given this, it is likely that the mechanism of effect that explains the process through which news media influences learning outcomes is different for clickbait content than for more traditional and truthful media types.

Future research should build on this model to test mediational and moderation effects of clickbait headlines on knowledge, attitudes, beliefs, and behavior across a variety of communication contexts. One important next step in this research is to identify the specific process of influence through which exposure to incongruent headlines influences news-relevant outcomes. The current study provides

compelling evidence that clickbait headlines have a distinct influence on resultant knowledge and beliefs, but the exact mechanism remains unclear as our operationalization of elaboration did function as a mediator. Future research in this area should consider a valenced operationalization that looks at the extent of agreement or disagreement with article content; perhaps elaboration can function as a mediator if research can isolate whether people were agreeing with the message or counter-arguing against it.

Limitations and Future Research

One limitation of the present investigation is that the experiment was conducted online and can only represent members of the population who read and consume news digitally. Future research should take print media under consideration and focus on validating the findings of the present investigation in alternative contexts. One area of improvement for future research is a measurement of the dependent variable. In our study, reading the entire article resulted in a modest increase in recognition, suggesting either the questions themselves or the multiple-choice response options provided were too simple. Future research should explore different types of measurement for recognition and comprehension, including writing more difficult items and considering open response options for answers. In addition, it would be worthwhile to study these relationships using a random-effects model to test multiple and varied types of clickbait headlines to see the extent to which these findings hold up across variations in headline style and writing. Another limitation was that in Study 1, quota-sampling was used to result in a sample nationally representative (in the US) on age and race, but not gender, resulting in a 77% female sample. Finally, future research would benefit from exploring more distal outcomes of media learning, including how knowledge and beliefs translate to behavioral intentions and ultimately, behavior.

Conclusion

This article assessed the effect of clickbait headlines or those that are incongruent with article content, on media learning. Results suggest that clickbait headlines can reduce recognition and comprehension, and this can endure despite reading corrective content within the article. Study 2 revealed that exposure to the full article, as opposed to only the headline, unexpectedly led to higher comprehension scores than recognition scores. This suggests alternative constructs may be influencing learning outcomes beyond the variables included in the cognitive mediation model. Perhaps the mechanism of effect through which news media influences learning outcomes is different for clickbait content than for more traditional media types, a notion that should be prioritized in future theoretical work in this area.

References

Adams, R. C., Sumner, P., Vivian-Griffiths, S., Barrington, A., Williams, A., Boivin, J., Chambers, C. D., & Bott, L. (2017). How readers understand causal and correlational expressions used in news headlines. *Journal of Experimental Psychology: Applied, 23*(1), 1–14. https://doi.org/10.1037/xap0000100

Andrew, B. C. (2007). Media-generated shortcuts: Do newspaper headlines present another roadblock for low-information rationality? *The Harvard International Journal of Press/Politics, 12*(2), 24–43. https://doi.org/10.1177/1081180x07299795

Ausubel, D. P., Novak, J. D., & Hanesian, H. (1978). *Educational psychology: A cognitive view* (2nd ed.). Holt, Rinehart & Winston.

Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis, 20*, 351–368.

Biyani, P., Tsioutsiouliklis, K., & Blackmer, J. (2016, February). *"8 amazing secrets for getting more clicks": Detecting clickbaits in news streams using article informality.* Paper presented at the 30th AAAI Conference on Artificial Intelligence.

Brunt, M. E., Murray, M. D., Hui, S. L., Kesterson, J., Perkins, A. J., & Tierney, W. M. (2003). Mass media release of medical research results: An analysis of antihypertensive drug prescribing in the aftermath of the calcium channel blocker scare of March 1995. *Journal of General Internal Medicine, 18*(2), 84–94. https://doi.org/10.1046/j.1525-1497.2003.20502.x

Cacioppo, J. T., Glass, C. R., & Merluzzi, T. V. (1979). Self-statements and self-evaluations: A cognitive response analysis of heterosexual social anxiety. *Cognitive Therapy and Research, 3*(3), 249–262.

Cacioppo, J. T., Petty, R. E., & Feng Kao, C. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*(3), 306–307. https://doi.org/10.1207/s15327752jpa4803_13

Casler, K., Bickel, L., & Hackett, E. (2013). Separate but equal? A comparison of participants and data gathered via Amazon's MTurk, social media, and face-to-face behavioral testing. *Computers in Human Behavior, 29*(6), 2156–2160. https://doi.org/10.1016/j.chb.2013.05.009

Dor, D. (2003). On newspaper headlines as relevance optimizers. *Journal of Pragmatics, 35*(5), 695–721. https://doi.org/10.1016/S0378-2166(02)00134-0

Durlak, J. A. (2009). How to select, calculate, and interpret effect sizes. *Journal of Pediatric Psychology, 34*(9), 917–928. https://doi.org/10.1093/jpepsy/jsp004

Ecker, U. K., Lewandowsky, S., Chang, E. P., & Pillai, R. (2014). The effects of subtle misinformation in news headlines. *Journal of Experimental Psychology, 20*(4), 323–335. https://doi.org/10.1037/xap0000028

Eveland, W. P. (2001). The cognitive mediation model of learning from the news. *Communication Research, 28*(5), 571–601. https://doi.org/10.1177/009365001028005001

Farhi, P. (2008). Don't blame the journalism. *American Journalism Review, 30*(5), 14–15.

Geer, J. G., & Kahn, K. F. (1993). Grabbing attention: An experimental investigation of headlines during campaigns. *Political Communication, 10*(2), 175–191. https://doi.org/10.1080/10584609.1993.9962974

Gillund, G., & Shiffrin, R. M. (1984). A retrieval model for both recognition and recall. *Psychological Review, 91*(1), 1–67. https://doi.org/10.1037/0033-295x.91.1.1

Gurmankin, A. D., & Viswanath, V. (2005). *The impact of health information overload on attention to information and cancer risk reduction behavior* [Powerpoint presentation]. US National Institutes of Health, National Cancer Institute. http://hints.cancer.gov/hints/docs/Gurmankin.pdf

Han, P. K. J., Moser, R. P., & Klein, W. M. P. (2007). Perceived ambiguity about cancer prevention recommendations: Associations with cancer-related perceptions and behaviors in a US population survey. *Health Expectations, 10*(4), 321–336. https://doi.org/10.1111/j.1369-7625.2007.00456.x

Hauser, D. J., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior Research Methods, 48*(1), 400–407.

Hearst Corporation. (2013). *Cosmopolitan: Fun, fearless, female.* http://www.hearst.com/magazines/cosmopolitan.php

Ho, S. S., Peh, X., & Soh, V. W. L. (2013). The cognitive mediation model: Factors influencing public knowledge of the H1N1 pandemic and intention to take precautionary behaviors. *Journal of Health Communication, 18*(7), 773–794. https://doi.org/10.1080/10810730.2012.743624

Jensen, J. D. (2011). Knowledge acquisition following exposure to cancer news articles: A test of the cognitive mediation model. *Journal of Communication, 61*(3), 514–534. https://doi.org/10.1111/j.1460-2466.2011.01549.x

Jensen, J. D., King, A. J., Carcioppolo, N., Krakow, M., Samadder, N. J., & Morgan, S. E. (2014). Comparing tailored and narrative worksite interventions at increasing colonoscopy adherence in adults 50–75: A randomized controlled trial. *Social Science & Medicine, 104*, 31–40. https://doi.org/10.1016/j.socscimed.2013.12.003

Kim, K., Lustria, M. L. A., Burke, D., & Kwon, N. (2007). Predictors of cancer information overload: Findings from a national survey. *Information Research, 12*(4). http://InformationR.net/ir/12-4/paper326.html

Kuiken, J., Schuth, A., Spitters, M., & Marx, M. (2017). Effective headlines of newspaper articles in a digital environment. *Digital Journalism, 5*(10), 1300–1314. https://doi.org/10.1080/21670811.2017.1279978

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for *t*-tests and ANOVAs. *Frontiers in Psychology, 4*, Article 863. https://doi.org/10.3389/fpsyg.2013.00863

Narins, E. (2016, December 14). *White wine has a scary link to skin cancer: You need to divorce chardonnay and switch to pinot noir immediately.* https://www.cosmopolitan.com/health-fitness/a8500059/white-wine-skin-cancer-study/

Niederdeppe, J., & Gurmankin Levy, A. (2007). Fatalistic beliefs about cancer prevention and three prevention behaviors. *Cancer Epidemiology, Biomarkers, & Prevention, 16*(5), 998–1002. https://doi.org/10.1158/1055-9965.EPI-06-0608

Pfau, M. R. (1995). Covering urban unrest: The headline says it all. *Journal of Urban Affairs, 17*(2), 131–141. https://doi.org/10.1111/j.1467-9906.1995.tb00340.x

Potthast, M., Köpsel, S., Stein, B., & Hagen, M. (2016). Clickbait detection. In N. Ferro, F. Crestani, M.-F. Moens, J. Mothe, F. Silvestri, G. Maria Di Nunzio, C. Hauff, & G. Silvello (Eds.), *Advances in information retrieval. ECIR 2016. Lecture Notes in Computer Science* (Vol. 9626, pp. 810–817). Springer. https://doi.org/10.1007/978-3-319-30671-1_72

Rivera, A., Nan, H., Li, T., Qureshi, A., & Cho, E. (2016). Alcohol intake and risk of incident melanoma: A pooled analysis of three prospective studies in the United States. *Cancer Epidemiology, Biomarkers & Prevention, 25*(12), 1550–1558. https://doi.org/10.1158/1055-9965.EPI-16-0303

Scacco, J. M., & Muddiman, A. (2020). The curiosity effect: Information seeking in the contemporary news environment. *New Media & Society, 22*(3), 429–448.

Schwartz, L. M., & Woloshin, S. (2003). On the prevention and treatment of exaggeration. *Journal of General Internal Medicine, 18*(2), 153–154. https://doi.org/10.1046/j.1525-1497.2003.21216.x

Shire, E. (2014, July 14). *Saving us from ourselves: The anti-clickbait movement.* https://www.thedailybeast.com/saving-us-from-ourselves-the-anti-clickbait-movement

Silverman, C. (2015). *Lies, damn lies, and viral content: How news websites spread (and debunk) online rumors, unverified claims, and misinformation.* https://towcenter.org/wp-content/uploads/2015/02/LiesDamnLies_Silverman_TowCenter.pdf

Van Dijk, T. A. (1988). *News as discourse.* Erlbaum.

Witte, K. (1996). Predicting risk behaviors: Development and validation of a diagnostic scale. *Journal of Health Communication, 1*(4), 317–342. https://doi.org/10.1080/108107396127988

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior, 27*(5), 591–615. https://doi.org/10.1177/109019810002700506

History

Open Data

Funding

ORCID

Nick Carcioppolo
https://orcid.org/0000-0002-2991-2965

Nick Carcioppolo
Department of Communication Studies
University of Miami
5100 Brunson Drive
Coral Gables, FL 33146
USA
carcioppolo.nick@gmail.com

Nick Carcioppolo (PhD) is an Associate Professor of Communication Studies and Affiliate Faculty at the Sylvester Comprehensive Cancer Center at the University of Miami. His research primarily focuses on cancer communication interventions for primary and secondary cancer prevention.

Di Lun is a U-LINK predoctoral research fellow and a PhD candidate in the School of Communication at University of Miami. Her research involves the development and assessment of both interactive and non-interactive educational materials for health communication campaigns and interventions with an emphasis on cancer prevention.

Soroya Julian McFarlane (PhD) is an Assistant Professor in the Department of Communication Studies at the University of Georgia. Her research focuses on designing and evaluating communication interventions that address health disparities at the community level. Research interests: health disparities, message design, community-engaged research; campaigns and interventions – design and evaluation; clinical trials; new biomedical preventive technologies.

Danger, Sex, and Everything Else

A Comparison of Camera Angle and Camera Distance Effects Across Pictures of Varied Emotional Content

Lucía Cores-Sarría[1] , Brent J. Hale[2], and Annie Lang[1]

[1]The Media School, Indiana University Bloomington, IN, USA
[2]School of Communication, University of Southern Mississippi, MS, USA

Abstract: This study tests the effects of camera distance and camera angle on emotional response across four categories of pictures covering a large emotional range (positive and negative miscellanea, erotica, and threat), using the International Affective Picture System (IAPS) –a large database of emotionally evocative photographs. We content analyzed 722 images for the content category and camera framing (distance and angle), employing these as independent factors in analyses, and used the IAPS' pre-existing normative average ratings of emotional valence, arousal, and dominance as dependent variables. As hypothesized, affective responses were generally increased by closer framing and high and low angles (compared to straight angles), but the content of the picture played an important role in determining effect strength and direction. In particular, closeness increased arousal for all picture groups but had the opposite effect on positive miscellaneous pictures, straight angles decreased the emotional response for the two miscellanea groups, and low angles increased the emotional response for threatening pictures. This study is the first to show that previously found camera framing effects apply to pictures of high emotional intensity (e.g., erotica and threat). We suggest that future work should consider formal manipulations alongside message content.

Keywords: camera angle, camera distance, arousal, valence, shot type

Photographs are ubiquitous in all types of media, ranging from billboards and newspapers to dating apps. Pictures are a powerful means of communication because they convey a massive amount of information that is automatically processed in fractions of a second, thanks to their optical similarity to natural, non-mediated visual perception (Hochberg, 2007). Although people's psychological responses to pictures mostly depend on the objects and events depicted, there is a layer of meaning that is determined by how the camera frames the content of the picture. Camera framing encompasses the distance, angle, height, level, and focus of the camera (Bordwell et al., 2016, p. 187), all of which are structural aspects present across all visual media, unlike content aspects that differ from message to message (Detenber & Lang, 2010). Camera distance and camera angle have received the most attention in media research, with a growing body of experimental studies backing up theoretical claims from media theorists on distance and angle effects. However, most of the empirical research on camera framing uses few messages or single-message designs, and stimuli that tend to be of low emotional intensity. The use of such homogenous stimuli brings up two concerns: first, it leaves unstudied any potential form and content interactions, and second, it limits the generalizability of previous findings, because they are based on stimuli that do not accurately represent the wide variety of emotional content found in visual communication. As it has been pointed elsewhere (cf. Reeves et al., 2016), the lack of stimuli variability is a pervasive problem in media psychology that limits the usefulness of published findings. Accordingly, this study aims to address this shortcoming by assessing camera framing effects across a large dataset of pictures of varying emotional intensity and types of content.

Literature Review

Camera distance, also called shot type, is typically defined in relation to a human subject, and ranges from extreme close-up to close-up, medium close-up, medium shot, medium-long shot, long shot, and extreme long shot (Bordwell et al., 2016). Experimental research has shown that closer shots facilitate elaboration about the mental life of the subject (Bálint et al., 2020) and polarize affective perception, emphasizing either the negativity or the positivity of the impression (Mutz, 2007; Reeves et al., 1992). However, a closer look at the literature suggests complex effects when message content is considered. For instance, Mutz (2007) found that close-ups of uncivil speakers in a televised debate led to more intense evaluations and emotional responses than medium shots, as expected, but not when speakers exhibited civility. Additionally, Canini et al. (2011) found

the largest percentage of close-ups in film scenes containing calm events, while long shots were the most prevalent in arousing scenes, which seemingly contradicts an increase in emotion as a function of closeness.

Unlike distance, *camera angle* is not subject-dependent but instead uses the ground as the point of reference (Giannetti, 1999, p. 14). Three broad categories describe differences in camera angle: low angle (when the camera is aimed upwards), straight on (when the camera is parallel to the ground), and high angle (when the camera is aimed downward). As conceptualized by film theorists, camera angle has a linear effect according to which straight angles are neutral, low angles emphasize power, and high angles indicate weakness (Giannetti, 1999). Such linearity has been supported by multiple experimental studies with high and low angles exhibiting opposing effects on power (Giessner et al., 2011; Kraft, 1987; Mandell & Shaw, 1973; Sevenants & d'Ydewalle, 2006), as well as other dimensions such as credibility (Avery & Long, 1976; Tiemens, 1970) and favorability (Meyers-Levy & Peracchio, 1992). However, there is also evidence to the contrary, with some studies have found that both high and low angles decrease perceived trustworthiness (Baranowski & Hecht, 2018), and that the pattern is rather disparate and non-linear when considering the degree of angle (Kepplinger & Donsbach, 1987).

Thus, there is cumulative evidence suggesting that camera framing effects may in fact be more complex and possibly more dependent on the content of the message than previously thought. However, the question of how form interacts with content remains largely unexplored because the stimuli employed in previous experiments have been of limited variability. This is particularly true for camera angle studies, where stimuli range from monologues, lectures, or newscasts (Avery & Long, 1976; Baranowski & Hecht, 2018; Mandell & Shaw, 1973; Reeves et al., 1992; Tiemens, 1970), to representations of everyday events (Kraft, 1987; Sevenants & d'Ydewalle, 2006), and images of objects (Meyers-Levy & Peracchio, 1992). Although some studies on camera distance have used more emotionally complex stimuli (Bálint et al., 2020; Canini et al., 2011; Mutz, 2007), they have typically used few or single message designs, with the exception of Canini et al. (2011), who did include messages from a larger emotional spectrum but found a reversed relationship between closeness and emotional arousal. Although previous research has used emotionally neutral stimuli, there is no theoretical reason to doubt that camera distance and camera angle effects should also occur for pictures covering a large emotional and content range, while it is possible that some differences could manifest.

As posited by a dimensional approach to emotion, the two dimensions that explain the most variance in affective responses are arousal (i.e., intensity) and valence (i.e., direction, positive or negative) (Bradley et al., 2001), and dominance is often added as a third dimension that taps into how in control one feels while experiencing an emotion (Osgood et al., 1957). We will look at the effects of camera framing on these three dimensions of emotion using four groups of pictures. The first two groups include a wide variety of pictures ranging from low to high arousal, depicting either positive or negative miscellaneous scenes. The third group contains erotic pictures, and the fourth group contains pictures of threatening content. Indicated by their affective ratings in the dataset, these last two groups score highly in arousal: one extremely positive (erotica), and one extremely negative (threat).

We expect that camera framing can intensify the emotional response of the viewer. For positive pictures, a more intense response would entail high arousal, positivity, and dominance ratings, while for negative pictures it would entail high arousal, high negativity, and low dominance ratings. Specifically, and in line with previous findings, for camera distance, we hypothesize that closer compared to further framing intensifies the emotional response. Thus:

Hypothesis 1 (H1): During positive picture viewing, closer framing will increase (a) arousal, (b) positivity, and (c) dominance.

Hypothesis 2 (H2): During negative picture viewing, closer framing will increase (a) arousal, but decrease (b) positivity and (c) dominance.

We also expect that camera angle can affect viewers' emotional responses. Since prior evidence suggests that straight angles are emotionally neutral, we predict that they will diminish emotional response compared to both high and low angles:

Hypothesis 3 (H3): During positive picture viewing, straight angles will lower (a) arousal, (b) positivity, and (c) dominance ratings compared to either high or low angles.

Hypothesis 4 (H4): During negative picture viewing, straight angles will lower (a) arousal and (b) negativity, and (c) increase dominance ratings compared to either high or low angles.

To address any potential differences between high and low angles, we ask:

Research Question 1 (RQ1): Do high and low angles differ in their impact on emotional responses to pictures?

Lastly, to determine whether the type of content influences responses, we will compare the findings of the two novel categories, erotica and threat, to those of the positive and negative picture groups:

Research Question 2 (RQ2): Do pictures of threatening and erotic content show (a) camera distance and (b) camera angle effects?

Methods

Stimuli and Dependent Variables

We conducted a secondary analysis of pictures available in the International Affective Picture System (IAPS; Lang et al., 2008) that had not been digitally altered and contained people ($N = 722$). IAPS is a standardized database of pictures used in studies of emotion and was constructed to include images that vary across the full emotional spectrum. In the IAPS technical manual, each picture has three normalized ratings – arousal (i.e., intensity of emotion), valence (i.e., direction of emotion, positive or negative), and feelings of dominance. These ratings, which are the dependent variables used in our analyses, were obtained by Lang et al. (2008) by averaging the evaluations of groups of 100 participants using the Self-Assessment Mannequin (SAM; Bradley & Lang, 1994), a 9-point pictorial scale ranging from 1 = *negative, calm, or not dominant* to 9 = *positive, arousing, or dominant*. A more detailed description of the rating procedure used for IAPS is included in the Electronic Supplementary Material, ESM 1. The pictures analyzed include a wide range of content, including portraits, landscapes (with human beings), depictions of violence, body mutilation, nudes, sexual imagery, and sporting events. Because IAPS pictures have been selected to cover the emotional space, the sample includes a wide range of values for self-reported arousal (range = 2.41–7.35), valence (range = 1.31–8.22), and dominance (range = 2.15–7.71).

Content Analysis Procedure

A codebook was developed to measure the camera distance and camera angle of pictures. Four coders (only one of whom was aware of hypotheses) were trained and intercoder reliability was assessed using Krippendorff's α. While coding, coders were not aware of the pictures' emotional ratings. One hundred ten images were used during training (15.4% of the sample), and 70 images were used for reliability assessment (9.8% of the sample). During training, discrepancies were corrected using consensus agreement. All coders used a 20.25 × 12.25″ monitor, positioned the monitor directly at eye level for each coding session, and

viewed all images in full-screen mode. For pictures with multiple people ($N = 342$) coders used the person closest to the camera whose face was visible as the point of reference. If multiple people were equally close, the leftmost person was selected. Each image was categorized for *camera distance* (α = .81) and *camera angle* (α = .82) (see ESM 1 for details). Using consensus coding, two coders determined each image's *content category*, which included *threat*, *erotica*, *positive miscellanea*, and *negative miscellanea* (see also ESM 1).

Design and Analysis

This study employed a 4 (category: positive miscellanea, negative miscellanea, erotica, and threat) × 2 (camera framing: distance or angle) × 3 (levels of framing: close/medium/far distance or high/straight/low angle) design. Multivariate analysis of variance (MANOVA) was used to analyze the data for all three dependent variables. The final MANOVA model excluded two higher-order nonsignificant effects: a Category × Angle × Distance 3-way interaction ($p = .50$), and a Distance × Angle 2-way interaction ($p = .72$). Significant multivariate effects were investigated using univariate analyses of variance (ANOVAs). Significant univariate findings were further explored using Bonferroni-corrected pairwise comparisons.

Results

The MANOVA revealed significant main effects of distance, angle, and category on valence, arousal, and dominance (see Table 1). There were also two significant interactions: Distance × Category and Angle × Category. To understand these interactions and to test our hypotheses, these significant results were followed-up with separate univariate ANOVAs for each dependent measure (arousal, valence, and dominance). MANOVA statistics are shown in Table 1, and findings for the univariate ANOVAs are shown in Table 2. Table 3 includes the means and standard deviations for camera distance and angle, as well as significant results from the post hoc comparisons.

Camera Distance

We predicted that closer shots would elicit stronger emotional responses than farther shots for positive (H1) and negative (H2) content. The interaction of Distance × Category was significant for arousal and valence, but not for dominance (see Table 2). Post hoc analyses showed that camera distance had the expected effect on arousal for three of the four content categories. Close framing was

Table 1. Multivariate analysis of variance (MANOVA) results

IVs	Pillai's trace	df	Error df	F	p	Multivariate η^2
Distance	.024	6	1,380	2.76	.001	.025
Angle	.026	6	1,380	3.02	.006	.013
Category	.827	9	2,073	87.61	< .001	.276
Category × Distance	.113	18	2,073	4.50	< .001	.038
Category × Angle	.047	15	2,073	2.18	.005	.016

Table 2. Univariate ANOVA results

IVs	DVs	Type III SS	df	Mean Square	F	p	η^2
Distance	Valence	1.371	2	0.685	0.984	.374	.0009
	Arousal	8.441	2	4.221	6.170	.002	.013
	Dominance	0.298	2	0.149	0.527	.591	.0005
Angle	Valence	3.249	2	1.624	2.332	.098	.002
	Arousal	6.481	2	3.240	4.737	.009	.010
	Dominance	3.011	2	1.506	5.330	.005	.006
Category	Valence	963.525	3	321.175	461.101	< .001	.654
	Arousal	119.323	3	39.774	58.146	< .001	.181
	Dominance	334.968	3	111.656	395.276	< .001	.620
Category × Distance	Valence	13.427	6	2.238	3.213	.004	.009
	Arousal	44.603	6	7.434	10.867	< .001	.067
	Dominance	2.676	6	0.446	1.579	.150	.005
Category × Angle	Valence	9.233	5	1.847	2.651	.022	.006
	Arousal	7.632	5	1.526	2.231	.050	.012
	Dominance	4.332	5	0.866	3.067	.010	.008

Table 3. ANOVA means and standard deviations for distance and angle univariate analyses

	Distance			Angle		
	Close	Medium	Far	High	Straight	Low
Arousal						
Positive	4.37 (0.08)$_a$	4.68 (0.10)$_a$	5.04 (0.09)$_a$	4.76 (0.09)$_a$	4.43 (0.06)$_{a,b}$	4.90 (0.16)$_b$
Negative	4.93 (0.18)$_a$	4.65 (0.21)	4.33 (0.26)$_a$	4.85 (0.15)$_†$	4.42 (0.12)$_†$	4.85 (0.48)
Erotic	6.05 (0.14)$_a$	5.75 (0.14)$_b$	4.83 (0.31)$_{a,b}$	5.6 (17)	5.49 (0.15)	–
Threat	6.31 (0.10)$_{a,†}$	5.87 (0.14)$_a$	5.95 (0.15)$_†$	5.77 (0.10)$_a$	5.89 (0.09)$_†$	6.47 (0.23)$_{a,†}$
Valence						
Positive	6.23 (0.08)	6.31 (0.08)	6.44 (0.09)	6.47 (0.09)	6.26 (0.06)	6.26 (0.16)
Negative	3.10 (0.14)	3.10 (0.21)	3.41 (0.26)	3.14 (0.15)$_†$	3.48 (0.11)$_†$	2.93 (0.49)
Erotic	6.33 (0.14)$_a$	6.05 (0.13)$_b$	5.05 (0.32)$_{a,b}$	5.78 (0.17)	6.10 (0.12)	–
Threat	2.43 (0.11)	2.63 (0.14)	2.57 (0.15)	2.52 (0.10)	2.74 (0.09)	2.35 (0.23)
Dominance						
Positive	5.90 (0.05)	5.86 (0.06)	5.73 (0.06)	5.83 (0.06)	5.85 (0.04)	5.80 (0.10)
Negative	4.28 (0.12)	4.27 (0.14)	4.44 (0.17)	4.25 (0.10)$_a$	4.63 (0.08)$_a$	4.11 (0.31)
Erotic	5.58 (0.09)	5.56 (0.09)	5.32 (0.20)	5.48 (0.11)	5.5 (0.09)	–
Threat	3.40 (0.07)	3.60 (0.09)	3.5 (0.09)	3.67 (0.06)$_a$	3.66 (0.06)$_b$	3.17 (0.15)$_{a,b}$

Note. Standard deviations appear in parentheses. Values with the same subscript ($_{a,b,†}$) within a group (e.g., threat: close, medium, and far) differ from each other at $_{a/b}p$ < .05; $_†p$ < .10.

more arousing than far framing for erotica (p = .001) and negative miscellanea (p = .036). Additionally, close framing was more arousing than a medium for threat (p = .008), and medium more arousing than far for erotica (p = .021). Surprisingly, positive miscellanea showed the opposite effect, with farther framing increasing arousal from

close to medium (p = .02), and from medium to far (p = .003). The only significant effect of camera distance on valence was for erotic pictures, with close framing being more positive than both medium (p = .011) and far (p = .001). Considered together, these results suggest that closer framing primarily influences arousal, with modest effects on valence. The exception being positive miscellanea, where far framing increased arousal.

Camera Angle

We predicted that high and low camera angles, compared to straight angles, would elicit stronger emotional responses for positive (H3) and negative (H4) content. There were significant interactions of picture category and angle for the three dependent variables (see Table 2). Post hoc analyses showed that angle only significantly affected arousal in a manner consistent with the hypothesis for positive miscellanea, where straight angles were significantly less arousing than both high (p = .003) and low (p = .012). Also, in line with the hypothesis, the two negative content groups showed significant effects of angle on dominance. High angles were lower in dominance than straight for negative miscellanea (p = .003), and low angles were lower in dominance than both high (p = .005) and straight (p = .006) for threatening pictures. Regarding RQ1, there was only one instance where high and low angles significantly differed from each other: in the threat group, low angles were more arousing (p = .015) and lower in dominance (p = .005) than high angles. Overall, these results support the prediction that straight angles are the least emotionally intense, but which angle intensifies (low, high, or both) what dimension (arousal or dominance) depends on image content.

Comparing Threat and Erotica to Miscellanea

Regarding RQ2, we found that emotional evaluations of the two high emotional intensity categories (i.e., erotica and threat) were influenced by camera framing in a manner consistent with the other categories (i.e., positive and negative miscellanea). This supports the possible generalizability of camera framing effects across the spectrum of emotional intensity, with some content-related caveats.

Discussion

This study aimed to assess the generalizability of camera angle and distance effects by testing them on the normed emotional ratings of a large dataset of pictures with great emotional variability, extending prior work that has largely neglected the potential role of content. Overall, our findings indicate that arousing pictures containing cues for sex or danger have camera framing effects comparable to those of emotionally milder stimuli. Camera distance and angle primarily influenced arousal, while the effects on the other emotional dimensions (i.e., valence, and dominance) varied across groups. Based on our findings, the camera angle might have stronger effects on negative images while camera distance could have equivalent effects between positive and negative images. Although our findings support the notion that camera framing modulates emotion, they also suggest that framing interacts with the content of the image.

Closer framing increased arousal for three of the picture categories (i.e., erotica, negative miscellanea, and threat), extending previous research by confirming effects across valence (positive and negative) and in stimuli of high emotional intensity. However, we found the opposite for positive miscellaneous pictures, possibly due to the range of image contents. For example, Canini et al. (2011) suggest that some positive events (such as sports) require further framing to capture the meaning of the scene. Indeed, we examined a subset of the positive miscellaneous group depicting single-person portraits and found that closeness increased arousal (F(2, 84) = 4.207, p = .018), supporting this interpretation. Additionally, closer framing significantly increased positivity for erotic pictures, but not for the negative groups.

Conversely, camera angle had more significant effects in negative compared to positive images. There was only one effect for the positive miscellanea group (straight angles being less arousing than low or high), and no significant effects for erotica. For the negative groups, straight angles increased dominance compared to high angles for negative miscellanea and compared to low angles for threatening pictures. These findings suggest that both high and low angles are more emotionally intense than straight angles, in contrast with findings from previous research where high and low angles exhibited opposite effects.

An exception is the threat group, where low angles decreased dominance and increased arousal compared to high. This finding would support a naturalistic interpretation of camera framing as a surrogate of our every day, non-mediated perception. In real life, the distance and the angle from a scene determine the actions available to the observer, which in turn are likely to affect their emotional response. For example, having something looming over you makes it more difficult to engage in defensive or aggressive behaviors (e.g., fleeing or punching) compared to being eye-level or above, so low angles should lead to stronger emotions when presented with a threat than in another negative, non-threatening contexts. More research

is needed to understand if formal effects are indeed rooted in non-mediated perception, as suggested by a naturalistic approach to media effects (cf. Anderson, 1998; Lang, 2014).

This study comes with some limitations. The affective responses in IAPS were obtained from a relatively homogenous demographic group (i.e., US college students, mostly white), so future studies are needed to confirm these findings across more demographically representative samples. Another limitation comes from the statistical strategy we adopted. Due to the aggregate nature of IAPS's ratings, we could only do a by-stimulus analysis, potentially raising two issues: statistical dependence and inflated degrees of freedom. Although the data might seem dependent, this issue is mitigated because IAPS ratings were obtained from 20 groups of approximately 100 people instead of a single individual. It is unlikely that these groups would significantly differ from each other in a way that would bias camera framing effects. Additionally, although our by-stimuli analysis yields more degrees of freedom than strict by-participant analysis, it nonetheless has a smaller sample size than a full repeated measures design. Lastly, these are limitations that apply to any study that uses the affective ratings of IAPS as dependent measures. Future research could benefit from using pictorial datasets that permit methods such as repeated measures ANOVA or multilevel modeling, which distinguish between participant and subject variance.

Based on our findings we have some practical recommendations. Researchers using images to study emotional responses to specific stimuli (e.g., phobia research) might want to control camera framing to avoid conflating the effects of form and content. For example, a closely-framed mild stimulus (e.g., a ladybug) might be experienced as more arousing than a far-framed scary stimulus (e.g., a spider), wrongly leading to the conclusion that ladybugs are scarier than spiders. Moreover, since we only found modest effects on valence and no effect on dominance for camera distance, we also recommend that researchers experimenting with camera distance prioritize measures that directly tap intensity of motivational activation (e.g., self-reported arousal or electrodermal activity). Our results also suggest that researchers interested in camera angle effects would benefit from using measures of arousal and of power/control (e.g., self-reported dominance), the latter especially for negative stimuli.

We advocate for future researchers to continue the work of understanding how content and emotion combine to modulate the effects of camera framing and angle on viewers' effective responses. We know that the use of single-message designs and homogeneous stimuli limits the generalizability of media research (Reeves et al., 2016) and prevents us from discovering potential interactions between structural features and specific types of content. Thus, we hope that future studies of structural features use larger pools of stimuli with different types of content varying in emotional direction and intensity, furthering our understanding of how formal manipulations interact with the content of pictorial messages.

Electronic Supplementary Materials

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1027/1864-1105/a000295

ESM 1. Rating procedure used for IAPS

References

Anderson, J. D. (1998). *The reality of illusion: An ecological approach to cognitive film theory*. SIU Press.

Avery, R. K., & Long, J. F. (1976, November). *The effect of vertical camera angle on the perceived credibility of a televised speaker*. Paper presented at annual convention of Western Speech Communication Association, San Francisco, CA.

Bálint, K. E., Blessing, J. N., & Rooney, B. (2020). Shot scale matters: The effect of close-up frequency on mental state attribution in film viewers. *Poetics, 83*, Article 101480. https://doi.org/10.1016/j.poetic.2020.101480

Baranowski, A. M., & Hecht, H. (2018). Effect of camera angle on perception of trust and attractiveness. *Empirical Studies of the Arts, 36*(1), 90–100. https://doi.org/10.1177/0276237417710762

Bordwell, D., Thompson, K., & Smith, J. (2016). *Film art: An introduction* (11th ed.). McGraw-Hill.

Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry, 25*(1), 49–59. https://doi.org/10.1016/0005-7916(94)90063-9

Bradley, M. M., Codispoti, M., Cuthbert, B. N., & Lang, P. J. (2001). Emotion and motivation I: Defensive and appetitive reactions in picture processing. *Emotion, 1*(3), 276–298. https://doi.org/10.1037/1528-3542.1.3.276

Canini, L., Benini, S., & Leonardi, R. (2011, September). Affective analysis on patterns of shot types in movies. In IEEE. (Ed.), *2011 7th International Symposium on Image and Signal Processing and Analysis (ISPA)* (pp. 253–258). IEEE.

Detenber, B. H., & Lang, A. (2010). The influence of form and presentation attributes of media on emotion. In K. Doveling, C. von Scheve, & E. A. Konijn (Eds.), *The Routledge handbook of emotions and mass media* (pp. 275–293). Routledge. https://doi.org/10.4324/9780203885390

Giannetti, L. D. (1999). *Understanding movies* (9th ed.). Prentice Hall.

Giessner, S. R., Ryan, M. K., Schubert, T. W., & van Quaquebeke, N. (2011). The power of pictures: Vertical picture angles in power pictures. *Media Psychology, 14*(4), 442–464. https://doi.org/10.1080/15213269.2011.620541

Hochberg, J. (2007). The Psychophysics of Pictorial Perception. In M. A. Peterson & H. A. Sedgwick (Eds.), *In the mind's eye: Julian Hochberg on the perception of pictures, films, and the world* (pp. 30–56). Oxford University Press.

Kepplinger, H. M., & Donsbach, W. (1987). The influence of camera perspectives on the perception of a politician by supporters, opponents, and neutral viewers. In D. L. Paletz (Ed.), *Political communication research: Approaches, studies, assessments* (pp. 62–72). Ablex Publishing Corporation.

Kraft, R. N. (1987). The influence of camera angle on comprehension and retention of pictorial events. *Memory & Cognition, 15*(4), 291–307. https://doi.org/10.3758/BF03197032

Lang, A. (2014). Dynamic human-centered communication systems theory. *The Information Society, 30*(1), 60–70. https://doi.org/10.1080/01972243.2013.856364

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2008). *International affective picture system (IAPS): Affective ratings of pictures and instruction manual*. NIMH, Center for the Study of Emotion & Attention.

Mandell, L. M., & Shaw, D. L. (1973). Judging people in the news – unconsciously: Effect of camera angle and bodily activity. *Journal of Broadcasting & Electronic Media, 17*(3), 353–362.

Meyers-Levy, J., & Peracchio, L. A. (1992). Getting an angle in advertising: The effect of camera angle on product evaluations. *Journal of Marketing Research, 29*(4), 454–461. https://doi.org/10.2307/3172711

Mutz, D. C. (2007). Effects of "in-your-face" television discourse on perceptions of a legitimate opposition. *American Political Science Review, 101*(4), 621–635. https://doi.org/10.1017/S000305540707044X

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). *The measurement of meaning* (No. 47). University of Illinois Press.

Reeves, B., Lombard, M., & Melwani, G. (1992, May). *Faces on the screen: Pictures or natural experience*. Paper presented to the annual meeting of the International Communication Association, Miami, FL.

Reeves, B., Yeykelis, L., & Cummings, J. J. (2016). The use of media in media psychology. *Media Psychology, 19*(1), 49–71. https://doi.org/10.1080/15213269.2015.1030083

Sevenants, A., & d'Ydewalle, G. (2006). Does it matter to be pictured from below? *Psychologica Belgica, 46*(3), 199–210. https://doi.org/10.5334/pb-46-3-199

Tiemens, R. K. (1970). Some relationships of camera angle to communicator credibility. *Journal of Broadcasting & Electronic Media, 14*(4), 483–490.

Conflict of Interest
No potential conflict of interest was reported by the authors.

ORCID
Lucia Cores-Sarria
https://orcid.org/0000-0002-6422-2775

Lucía Cores-Sarría
The Media School
Indiana University Bloomington
601 E. Kirkwood Ave.
Bloomington, IN 47401
USA
lucicore@iu.edu

Lucía Cores-Sarría is pursuing a joint degree in Media and Cognitive Science at Indiana University with the support of a Fulbright Scholarship. Lucía received her joint BA degree in Journalism and Audiovisual Communication from Carlos III University of Madrid, and her MA degree in Cognitive Semiotics from Aarhus University. Her research looks at how cinematography, such as the distance, the movement, or the angle of the camera affects the emotional and cognitive responses to moving images.

Brent J. Hale (PhD, Indiana University) is an Assistant Professor of Communication Studies at the University of Southern Mississippi. His research focus includes interlocutory and psychological responses to social media content through commenting, including messages related to health and politics.

Annie Lang (PhD, University of Wisconsin) is a Distinguished Professor at Indiana University. Her research focuses on understanding communication and media from a dynamic human-centered complex systems perspective. She is particularly interested in rethinking communication theories as changes in qualitative states occurring over time rather than as reductive, additive, linear, processes. Recent work focuses on the dynamics of persuasion, the role of the body in attitude change, destabilizing real-world attractors through game play, and on how to direct perception bypasses the mind to affect our motivational responses.

Social Media Posting Anxiety

Interpersonal Trust, Fear of Negative Evaluation, and Hurt Feeling Proneness as Predictors

Reza Shabahang[1], Mara S. Aruguete[2] , and Hyejin Shim[3]

[1]University of Tehran, Tehran, Iran
[2]Department of Social and Behavioral Sciences, Lincoln University, Jefferson City, MO, USA
[3]University of Missouri, Missouri, MO, USA

Abstract: Although many studies have shown the association between anxiety and use of social media, the extant literature has not investigated social media posting anxiety, or fears associated with sharing online content. The current study reports the development of a brief self-report questionnaire addressing social media posting anxiety. In addition, we examine psychological predictors of social media posting anxiety. The findings demonstrate good content validity for the Social Media Posting Anxiety Questionnaire (SMPAQ; S-CVI/Avg: .89; mean CVRs: .90). Exploratory factor analysis revealed that the 6-item SMPAQ measured a single dimension, accounting for 49.90% of the explained variance. Confirmatory factor analysis showed support for this one-factor model. Internal consistency was established using inter-item correlation, corrected item-total correlation, and Cronbach's α. Low interpersonal trust, high fear of negative evaluation, and high proneness to hurt feelings were associated with high social media posting anxiety. Notably, social media posting anxiety was a predictor of unwillingness to post in social media platforms. Our results support the SMPAQ as a promising measure that can facilitate better understanding of the role of anxiety in social media posting.

Keywords: online posting anxiety, social media platforms, interpersonal trust, fear of negative evaluation, hurt feelings

While there is a wealth of research on the influence of social media use on anxiety (see Keles et al., 2020, for a review), there are few studies that examine the anxiety that arises while using social media. Fears are often centered around social media posting (Alkis et al., 2017). Such worries may be related to negative expectations about how others may react to posts including anticipation of disapproval, ridicule, or judgment (Alkis et al., 2017). For example, Liu (2010) found that fears about negative evaluation from others were common in both Chinese and American social media users. Social media posting anxiety may be considered as a specific context for social anxiety, which involves persistent fear about situations in which a person expects to be negatively evaluated (Leichsenring & Leweke, 2017). Our study seeks to develop a reliable and valid scale to examine social media posting anxiety. In addition, we investigate correlates of social media posting anxiety.

The consequences of social media posting anxiety are largely unknown. It stands to reason that social media users who feel high levels of anxiety over posting would avoid posting (Liu, 2010). Indeed, over 50% of a random sample of Weibo users (a Chinese social media platform) had not posted in their timelines, suggesting that anxiety about posting may dissuade users from posting (Fu & Chau, 2013). Social media posting is associated with greater social support and subjective well-being, suggesting that fears

about posting may reduce potential for interpersonal connection (Yang et al., 2020). However, some degree of social media posting anxiety seems prudent given that employers regularly evaluate posts, and posting inappropriate content is common (e.g., Willoughby et al., 2020). Thus, there may be positive and negative outcomes of social media posting anxiety. Given that social media posting is ubiquitous, further investigation into the affective context of posting is warranted.

Variables associated with social anxiety, such as interpersonal trust, fear of negative evaluation, and proneness to hurt feelings are likely to predict social media posting anxiety. About one third of participants in the United States show low interpersonal trust, which is associated with social anxiety (Kaplan et al., 2015; Rainie & Perrin, 2020). Interpersonal trust in online environments can be even lower than in face-to-face interactions (Naquin & Paulson, 2003), which may increase anxiety or inhibit posting online. Fear of negative evaluation involves anxiety focused on expected undesirable evaluations. Since it is a core component of social anxiety (Liu et al., 2020; Yoon, 2015), fear of negative evaluation is also likely to be associated with anxiety about posting online. Hurt feelings involve perceived rejection from familiar others (Leary & Springer, 2001). Adults who report experiencing more hurt feelings tend to be more socially anxious than those who recall fewer hurt

feelings (Fung & Alden, 2017). This research shows that low interpersonal trust, fears of negative evaluations, and proneness to hurt feelings predict social anxiety. It follows that these variables are likely to also predict social media posting anxiety.

The main purpose of this study was to test the psychometric properties of the Social Media Posting Anxiety Questionnaire (SMPAQ). We also sought to examine predictors of social media posting anxiety, including interpersonal trust, fear of negative evaluation, and proneness to hurt feelings.

Method

Participants

A convenience sample of college students from Guilan University (Iran) was recruited through an advertisement posted to university social media groups. Initially, an online semi-structured interview was conducted by video call using a telecommunication application with 10 social media users who reported experiencing anxiety during posting (M_{age} = 23.10, SD = 3.31). Content validity of the Social Media Posting Anxiety Questionnaire (SMPAQ) was evaluated based on relevance, clarity, and simplicity by eight psychometric experts. Then, 30 participants were administered the SMPAQ online for pilot-testing (M_{age} = 21.73, SD = 3.86). Eventually, 404 participants (50.2% female, 49.8% male; M_{age} = 23.21, SD = 4.74) received an online survey including the SMPAQ, the Interpersonal Trust Scale (ITS; Rotter, 1967), the Brief Fear of Negative Evaluation scale (BFNE-II; Carleton et al., 2006), the Hurt Feeling Scale (HFS; Leary & Springer, 2001), and items related to attributes of their posting. The link to the online survey was sent directly to university social media groups. To ensure that data were gathered from students, each participant was asked to enter their academic email or student number. The inclusion criteria were having at least one social media account, being between 18 and 40 years old, and providing online consent. This study was in full compliance with the ethical principles specified by the Helsinki Declaration.

Measures

The SMPAQ was developed to measure anxiety experienced during posting (e.g., "I am anxious that my posts on social media might be held against me"; see Electronic Supplementary Material, Table S1). The items were rated from 1 (= strongly disagree) to 5 (= strongly agree), with higher scores indicating higher social media posting anxiety.

The psychometric properties of the SMPAQ were evaluated in the present study using CVI, CVR, EFA, CFA, inter-item correlation, corrected item-total correlation, and Cronbach's α.

The Interpersonal Trust Scale (ITS; Rotter, 1967) contains 25 items that assess the generalized expectancy that another individual or group can be relied upon (e.g., "In these competitive times, one has to be alert or someone is likely to take advantage of you"). Response options ranged from 1 (= strongly agree) to 5 (= strongly disagree), where higher scores indicated higher interpersonal trust. The scale has satisfactory validity and reliability (Chun & Campbell, 1974; Rotter, 1967).

The Brief Fear of Negative Evaluation scale, version 2 (BFNE-II; Carleton et al., 2006) includes 12 items (e.g., "I am afraid that others will not approve of me"). Each item is rated on a 5-point Likert scale, ranging from 0 (= not at all characteristic of me) to 4 (= extremely characteristic of me). The validity and reliability of the BFNE-II have been established (Carleton et al., 2007; Carleton et al., 2006).

The Hurt Feeling Scale (HFS; Leary & Springer, 2001) is a 6-item scale that measures the ease with which individuals experience hurt feelings (e.g., "My feelings are easily hurt"), with responses scored on a 5-point Likert scale (1 = not at all and 5 = extremely characteristic of me). Leary and Springer (2001) reported satisfactory psychometric properties of the scale.

To measure unwillingness to post in social media platforms because of anxiety, we included the item, "How much social media posting anxiety prevents you from posting in social media platforms?" Response options were on a 7-point Likert type scale from 1 = not at all to 7 = very much.

Participants also were asked to respond to the following questions: "What type of information would you be most anxious about posting?"; "Which form of sharing content would provoke the greatest anxiety: text, photos, audio, videos?"; "Which would make you most anxious: posting anonymously or with your real identity?"; "Which would make you more anxious: personal or non-personal content?"; and "Which would make you more anxious: posting content that agrees with the majority of the community or content that disagrees with the majority of the community?"

Procedure

A mixed-method design integrating qualitative and quantitative methods was utilized. The development of the SMPAQ was conducted in a standardized manner (Beatty et al., 2020). Questionnaire items were generated using related literature (Li & Lin, 2016; Liu, 2010) and semi-structured interviews. Evaluation of content validity by a

panel of experts and subsequent pilot study served to improve the wording of items. Based on these sources, a 9-item version of SMPAQ was developed.

The reliability and validity of SMPAQ was examined using content validity index (CVI; Waltz & Bausell, 1981), content validity ratio (CVR; Lawshe, 1975), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), inter-item correlation, corrected item-total correlation, and Cronbach's α. The expert panel scored each item based on clarity, simplicity, and relevance (1 = *not clear/not relevant* to 4 = *clear/relevant*). The number of experts judging the item as acceptable (3–4) was divided by the total number of experts to obtain an item content validity index (I-CVI) for each item. Then, scale content validity (S-CVI) was assessed by calculating average I-CVIs. An S-CVI of ≥ .90 indicates excellent content validity. For calculating CVR, the expert panel was asked to rate the appropriateness of each item using a 3-point scale (*essential*, *useful but not essential*, or *not necessary*). A CVR for each item was computed as the proportion of panelists that considered the item essential. The CVRs were then compared to the value of .75, the minimum required for eight raters based on Lawsche's table. The value of each item was compared with the values in the Lawshe's table. If the item CVR was equal to or higher than the minimum required value in Lawshe's table, the item was preserved (see Zamanzadeh et al., 2015).

EFA (n = 202) and CFA (n = 202) were conducted using subsamples derived from the total sample (N = 404) with fair sample sizes (Comrey & Lee, 1992). Further, Pearson correlation coefficients and multiple regression analysis were used to explore psychological determinants and consequence of social media posting anxiety.

Results

Participants reported Instagram as their most used social media platform (Instagram: 77%; others: 11.9%; Iranian social media platforms: 4.7%; YouTube: 2.7%; Twitter: 2.5%; TikTok: 0.5%; Snapchat: 0.5%; and/or Facebook: 0.2%). However, most participants (78.5%) used two or more social media platforms. Participants reported the most anxiety about posting political information (political: 44.6%; personal: 43.6%; religious: 4%; social: 3.2%; educational: 1.5%; sports: 1%; art: 1%; entertainment: 0.7%; economic: 0.5%). Posting videos created more anxiety than other posts (video: 47.3%; photo: 24.5%; text: 18.1%; audio: 10.1%). The participants experienced more anxiety when they posted with their real identities (77.2%) in comparison with anonymous posting (22.8%). Posting personal content (personal: 72%; non-personal; 28%) and information

contrary to the views of the community (contrary to the views of the community: 84.9%; agrees with the views of the community: 15.1%) were more anxiety-provoking.

The 9-item version of SMPAQ showed high content validity (S-CVI/Ave: .89; means of item CVRs: .90). The internal consistency with the complete 9-item scale was estimated by Cronbach's α (α = .89, 95% CI = [.87, .91]). Initial EFA was used to explore the factor structure and suggested up to three factors. The eigenvalue of the first factor was 4.34 while the second and third factors were .55 and .34, respectively, implying that the data satisfied a single dimension of the scale criteria (Slocum-Gori & Zumbo, 2011; Schjoedt & Craig, 2017) as follows: (1) ratio of the first to second eigenvalues were equal or greater than 3 (i.e., 4.34/0.55 = 7.89), and (2) the overall variance explained by the first factor was larger than 20% (i.e., 4.34/9 = 48.22%). To obtain the best model fit, three items (SMPAQ 1, 8, and 9) suspected of measuring unintended factors were deleted. The analyses were then repeated with six items, which still showed good internal consistency reliability (α = .84, 95% CI = [.82, .87]).

Kaiser–Meyer–Olkin (KMO = .85) and Bartlett's test of sphericity, $\chi^2(15) = 486.20$, $p < .001$, confirmed the adequacy and suitability of data prior to the execution of factor analysis (n = 202). The factor analysis was conducted with the principal component analysis using varimax rotation within six items. EFA (n = 202) yielded a one-factor solution as the best fit for the data, accounting for 49.90% of the variance (see ESM 1, Table S2). The scree plot showed that the eigenvalues of the first factor were greater than 1 and accounted for most of the total variability in the data, indicating that a large proportion of the total variance was explained by one factor (see ESM 1, Figure S1). The factor solution obtained from EFA was tested through CFA maximum-likelihood estimation analysis (n = 202). Overall model fit was determined by calculating fit indices including the χ^2 and the χ^2/df (cutoff ≤ 3; Marsh & Balla, 1994), the comparative fit index (CFI; cutoff ≥ 0.90; Bentler, 1990), the Tucker Lewis index (TLI; cutoff ≥ 0.90; Bentler & Bonnet, 1980), and the root mean square error of approximation (RMSEA; cutoff ≤ .08; Browne & Cudeck, 1993). CFA results (see ESM 1, Table S3) supported the theorized one-factor model ($\chi^2 = 17.93$, $\chi2/df = 1.99$, $p < .05$; CFI = .98; TLI = .96; RMSEA = .07).

Item analysis indicated excellent inter-item correlation (range = .36–.65; see ESM 1, Table S4), corrected item-total correlation (range = .57–.71; see ESM 1, Table S5), and Cronbach's α (α = .84, 95% CI = [.82, .87]), supporting the internal consistency of the SMPAQ. According to the Cronbach's α "if item deleted" column, none of the values was greater than the α value of the whole scale (α = .84), indicating no need to eliminate any items (see ESM 1, Table S5).

After establishing psychometric properties of the SMPAQ, Pearson correlation coefficients and multiple regression analysis were used to examine the correlates of social media posting anxiety. Cronbach's α was adequate for all variables (α > .80). As expected (see ESM 1, Table S6), interpersonal trust ($r = -.46$; $p < .01$), fear of negative evaluation ($r = .56$; $p < .01$), hurt feeling proneness ($r = .52$; $p < .01$), and unwillingness to post in social media platforms ($r = .45$; $p < .01$) were correlated with social media posting anxiety. The sum of interpersonal trust, fear of negative evaluation, and hurt feeling proneness accounted for .38 of the variance in social media posting anxiety ($R^2 = .38$, $p < .01$). Fear of negative evaluation ($\beta = .36$) was the best predictor of social media posting anxiety in the present study, followed by interpersonal trust ($\beta = -.18$; $p < .01$), and hurt feeling proneness ($\beta = .18$; $p < .01$; see ESM 1, Table S7).

Additionally, regression results (see ESM 1, Table S8) confirmed the predictive value of social media posting anxiety in unwillingness to post in social media platforms ($R^2 = .20$, $p < .01$; $\beta = .45$; $p < .01$).

Discussion

The main contribution of this research was to develop a short, reliable, and valid scale to measure social media posting anxiety. The 6-item SMPAQ showed good content validity and internal consistency reliability. We also examined predictors of social media posting anxiety. As expected, low interpersonal trust, fear of negative evaluation, and high proneness to hurt feelings predicted social media posting anxiety. Previous research showed that these variables relate to social anxiety in general (Fung & Alden, 2017; Kaplan et al., 2015; Liu et al., 2020), supporting the contention that social media posting anxiety is a context-specific form of social anxiety. Furthermore, social media posting anxiety predicted an unwillingness to post on social media, suggesting that those who experience social media anxiety do not exhibit their authentic selves on social media.

One intriguing finding of our research was that posting political information generated more anxiety than posting other types of information. These results concur with Gera et al. (2020), who found that participants were less likely to post about politics than other topics. They concluded that this self-censorship of political views supports the Spiral of Silence Theory, which posits that fear of social rejection may cause people to choose silence over voicing their political opinions (Noelle-Neumann, 1991). It is also consistent with the process of groupthink (Janis, 1972), in which people are unlikely to voice dissenting opinions in favor of maintaining group harmony. These processes can quickly

lead to the establishment of one opinion as dominant on social media. Further research should explore the political implications of anxieties regarding political posts.

Limitations

The present study has some limitations. Participants were college students in Iran and do not constitute a representative sample of international social media users. However, fears about social evaluations with regard to social media posting have been shown to be common among American and Chinese social media users (Liu, 2010), suggesting some cross-cultural homogeneity. A second limitation is that the design was correlational, making it difficult to determine cause-and-effect relationships. For example, we can only speculate about whether interpersonal trust, fear of negative evaluation, and proneness to hurt feelings are causes or consequences of social media posting anxiety.

Social media posting anxiety is likely to have both advantages and disadvantages. Too much posting anxiety may prevent social networking or the formation of interpersonal relationships, while too little posting anxiety can lead to inappropriate posting which may increase social rejection. Social media posting anxiety should be further explored to assess how this type of social anxiety serves adaptive and or maladaptive purposes in online environments. In addition, we hope that the SMPAQ can serve as a useful tool for researchers interested in exploring trends in social media use, attitudes and beliefs toward social media, and social media authenticity.

Electronic Supplementary Materials

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1027/1864-1105/a000300

ESM 1. Table S1: Items of the initial 9-item version of Social Media Posting Anxiety Questionnaire (SMPAQ). Table S2: Exploratory factor analysis of items in the SMPAQ ($n = 202$). Figure S1: The scree plot obtained from exploratory factor analysis. Table S3: Goodness of fit indices for the one-factor model of the SMPAQ ($n = 202$). Table S4: Inter-item correlations of the items in the SMPAQ ($n = 404$). Table S5: Item characteristics compose of mean (SD), scale mean if item deleted, scale variance if item deleted, corrected item-total correlations, and Cronbach's α if item deleted the SMPAQ ($n = 404$). Table S6: Descriptive statistics and correlations for study's variables. Table S7: Summary statistics for the regression equation predicting social media posting anxiety ($n = 404$). Table S8: Summary statistics for the

regression equation predicting unwillingness to post in social media platforms by social media posting anxiety ($n = 404$).

References

Alkis, Y., Kadirhan, Z., & Sat, M. (2017). Development and validation of Social Anxiety Scale for Social Media Users. *Computers in Human Behavior, 72*, 296–303. https://doi.org/10.1016/j.chb.2017.03.011

Beatty, P. C., Collins, D., Kaye, L., Padilla, J. L., Willis, G. B., & Wilmot, A. (Eds.). (2020). *Advances in questionnaire design, development, evaluation and testing*. Wiley.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238

Bentler, P. M., & Bonnet, D. C. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588–606. https://doi.org/10.1037/0033-2909.88.3.588

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Sage.

Carleton, R. N., Collimore, K. C., & Asmundson, G. J. G. (2007). Social anxiety and fear of negative evaluation: Construct validity of the BFNE-II. *Journal of Anxiety Disorders, 21*(1), 131–141. https://doi.org/10.1016/j.janxdis.2006.03.010

Carleton, R. N., McCreary, D. R., Norton, P. J., & Asmundson, G. J. G. (2006). Brief Fear of Negative Evaluation scale – revised. *Depression and Anxiety, 23*(5), 297–303. https://doi.org/10.1002/da.20142

Chun, K.-T., & Campbell, J. B. (1974). Dimensionality of the Rotter Interpersonal Trust Scale. *Psychological Reports, 35*(3), 1059–1070. https://doi.org/10.2466/pr0.1974.35.3.1059

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis*. Lawrence Erlbaum Associates.

Fu, K., & Chau, M. (2013). Reality check for the Chinese microblog space: A random sampling approach. *PLoS One, 8*(3), Article e58356. https://doi.org/10.1371/journal.pone.0058356

Fung, K., & Alden, L. E. (2017). Once hurt, twice shy: Social pain contributes to social anxiety. *Emotion, 17*(2), 231–239. https://doi.org/10.1037/emo0000223

Gera, P., Thomas, N., & Neal, T. (2020). Hesitation while posting: A cross-sectional survey of sensitive topics and opinion sharing on social media. In A. Gruzd, P. Mai, R. Recuero, A. Hernández-García, C. S. Lee, J. Cook, J. Hodson, B. McEwan, & J. Hopke (Eds.), *SMSociety20: International Conference on Social Media and Society* (pp. 134–140). https://doi.org/10.1145/3400806.3400822

Janis, I. L. (1972). *Victims of groupthink: A psychological study of foreign-policy decisions and fiascos*. Houghton Mifflin.

Kaplan, S. C., Levinson, C. A., Rodebaugh, T. L., Menatti, A., & Weeks, J. W. (2015). Social anxiety and the Big Five personality traits: The interactive relationship of trust and openness. *Cognitive Behaviour Therapy, 44*, 212–222. https://doi.org/10.1080/16506073.2015.1008032

Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth, 25*(1), 79–93. https://doi.org/10.1080/02673843.2019.1590851

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology, 28*(4), 563–575. https://doi.org/10.1111/j.1744-6570.1975.tb01393.x

Leary, M. R., & Springer, C. A. (2001). Hurt feelings: The neglected emotion. In R. M. Kowalski (Ed.), *Behaving badly: Aversive behaviors in interpersonal relationships* (pp. 151–175). American Psychological Association. https://doi.org/10.1037/10365-006

Leichsenring, F., & Leweke, F. (2017). Social anxiety disorder. *New England Journal of Medicine, 376*(23), 2255–2264. https://doi.org/10.1056/nejmcp1614701

Li, L., & Lin, T. T. C. (2016). Examining Weibo posting anxiety among well-educated youth in China: A qualitative approach. *Information Development, 32*(4), 1240–1252. https://doi.org/10.1177/0266666915596057

Liu, L. (2010). Online posting anxiety: impacts on blogging. *Chinese Journal of Communication, 3*(2), 202–222. https://doi.org/10.1080/17544751003740391

Liu, X., Yang, Y., Wu, H., Kong, X., & Cui, L. (2020). The roles of fear of negative evaluation and social anxiety in the relationship between self-compassion and loneliness: A serial mediation model. *Current Psychology*. https://doi.org/10.1007/s12144-020-01001-x

Marsh, H. W., & Balla, J. (1994). Goodness of fit in confirmatory factor analysis: the effects of sample size and model parsimony. *Quality and Quantity, 28*(2), 185–217. https://doi.org/10.1007/BF01102761

Naquin, C. E., & Paulson, G. D. (2003). Online bargaining and interpersonal trust. *Journal of Applied Psychology, 88*(1), 113–120. https://doi.org/10.1037/0021-9010.88.1.113

Noelle-Neumann, E. (1991). The Theory of Public Opinion: The concept of the spiral of silence. *Annals of the International Communication Association, 14*(1), 256–287. https://doi.org/10.1080/23808985.1991.11678790

Rainie, L., & Perrin, A. (2020, July 27). *The state of Americans' trust in each other amid the COVID-19 pandemic*. https://www.pewresearch.org/fact-tank/2020/04/06/the-state-of-americans-trust-in-each-other-amid-the-covid-19-pandemic/

Rotter, J. B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality, 35*(4), 651–665. https://doi.org/10.1111/j.1467-6494.1967.tb01454.x

Schjoedt, L., & Craig, J. B. (2017). Development and validation of a unidimensional domain-specific entrepreneurial self-efficacy scale. *International Journal of Entrepreneurial Behaviour and Research, 23*(1), 98–113. https://doi.org/10.1108/IJEBR-11-2015-0251

Slocum-Gori, S. L., & Zumbo, B. D. (2011). Assessing the unidimensionality of psychological scales: Using multiple criteria from factor analysis. *Social Indicators Research, 102*(3), 443–461. https://doi.org/10.1007/s11205-010-9682-8

Waltz, C. F., & Bausell, R. B. (1981). *Nursing research: Design, statistics, and computer analysis*. F.A. Davis.

Willoughby, J. F., Hust, S. J. T., Li, J., Couto, L., Kang, S., & Domgaard, S. (2020). An exploratory study of adolescents' social media sharing of marijuana-related content. *Cyberpsychology, Behavior, and Social Networking, 23*(9), 642–646. https://doi.org/10.1089/cyber.2019.0721

Yang, C. C., Tsai, J. Y., & Pan, S. (2020). Discrimination and well-being among Asians/Asian Americans during COVID-19: The role of social media. *Cyberpsychology, Behavior, and Social Networking*. https://doi.org/10.1089/cyber.2020.0394

Yoon, H. J. (2015). Humor effects in shame-inducing health issue advertising: The moderating effects of fear of negative evaluation. *Journal of Advertising, 44*(2), 126–139. https://doi.org/10.1080/00913367.2015.1018463

Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi-Majd, H., & Nikanfar, A. R. (2015). Design and implementation content validity study: Development of an instrument for measuring Patient-Centered Communication. *Journal of Caring Sciences, 4*(2), 165–178. https://doi.org/10.15171/jcs.2015.017

ORCID
Mara S. Aruguete
https://orcid.org/0000-0003-0588-1516

Mara S. Aruguete
Department of Social and Behavioral Sciences
Lincoln University
Jefferson City, MO 65201
USA
aruguetem@lincolnu.edu

Reza Shabahang graduated with an MA degree in general psychology from the University of Tehran, Iran. His research focuses on social psychology. His current research interests focus primarily on developing and validating measurements on the field of media psychology.

Hyejin Shim is doctoral candidate in statistics, measurement, and evaluation in education at the University of Missouri. Her research interests are in the area of psychological measurement, with a particular focus on item response theory.

Mara S. Aruguete earned her PhD at the University of California-Davis and has served as a Professor of Psychology at Lincoln University of Missouri for 24 years. She has authored two books and over 60 articles. She serves as a Division Chair of the Missouri Academy of Science.

Appendix

Social Media Posting Anxiety Questionnaire (SMPAQ)

The statements below concern your attitude toward the posting in social media platforms. Please read them carefully. Indicate the number that most accurately defines your point of view. There are no right or wrong answers. All answers are valuable, provided they are sincere.

Item responses ranged from 1 = *strongly disagree* to 5 = *strongly agree*.

Please check to see if you have answered all the questions. Thank you for your cooperation.

1. I feel anxious when I think about posting on social media.	1	2	3	4	5
2. I envision poor consequences related to my posting on social media.	1	2	3	4	5
3. Posting on social media could easily bring about negative outcomes in my life.	1	2	3	4	5
4. I am anxious that my posts on social media might be held against me.	1	2	3	4	5
5. I feel anxious about making a negative impression on people by posting on social media.	1	2	3	4	5
6. I am concerned about people thinking poorly of me by considering my posts on social media.	1	2	3	4	5

Research Report

Links Between Exposure to Sexualized Instagram Images and Body Image Concerns in Girls and Boys

Marika Skowronski⊙, Robert Busching, and Barbara Krahé

Department of Psychology, University of Potsdam, Germany

Abstract: The current study examined the links between viewing female and male sexualized Instagram images (SII) and body image concerns within the three-step process of self-objectification among adolescents aged 13–18 years from Germany (N = 300, 61% female). Participants completed measures of SII use, thin- and muscular-ideal internalization, valuing appearance over competence, and body surveillance. Structural equation modeling revealed that SII use was associated with body image concerns for boys and girls via different routes. Specifically, female SII use was indirectly associated with higher body surveillance via thin-ideal internalization and subsequent valuing appearance over competence for girls. For both girls and boys, male SII use was indirectly linked to higher body surveillance via muscular-ideal internalization. Implications for the three-step model of self-objectification by sexualized social media are discussed.

Keywords: social media, sexualization, body image concerns, self-objectification, body surveillance

Instagram is one of the fastest-growing social networks and is most popular among teenagers, of whom 72% are using it (Pew Research Center, 2018). With over 100 million photographs uploaded on Instagram per day (Instagram, 2019), adolescents are likely to be exposed to a high number of images on a regular basis. There is a large body of research linking sexualized media, defined as media emphasizing sexual appearance and sexual appeal to others, to body image concerns (Karsay et al., 2018; Ward, 2016). Yet scholars have called for more research focusing on social media specifically and including male samples (Ward, 2016). The purpose of this study is to examine associations between adolescents' use of sexualized Instagram images (SII) and body image concerns, conceptualized here as appearance-ideal internalization (thin- and muscular-ideal), valuing appearance over competence, and body surveillance. The study extends previous research by examining the specific association of exposure to both male and female SII, by examining the role of different forms of appearance-ideal internalization (thin- and muscular-ideal), and by including both male and female adolescents.

Sexualized Media Use and Self-Objectification

A well-supported theoretical framework for understanding the relation of media exposure with body image is objectification theory (Fredrickson & Roberts, 1997). The theory states that women in Western culture learn from an early age that their body is evaluated by others and gradually internalize this observer perspective, thereby learning to evaluate themselves from a third-person, appearance-focused point of view. This process is called self-objectification and has been linked to numerous negative outcomes for women (Tiggemann & Williams, 2011). Self-objectification is manifested at the cognitive level in individuals' tendency to value appearance over competence (further referred to as valuing appearance); at the behavioral level, it is shown through persistent body surveillance (Calogero, 2011). Following objectification theory, sexualized media constitute one form of objectification and contribute to the development of self-objectification (Fredrickson & Roberts, 1997). Accordingly, an extensive body of correlational research has demonstrated links

between the use of sexualized media and self-objectification, and experimental research demonstrated that women exposed to sexualized media in the laboratory show heightened self-objectification (Karsay et al., 2018; Ward, 2016).

Media researchers have further identified women's tendency to internalize the society's appearance ideal as a mediator in this relation. A prominent model featuring appearance-ideal internalization is the three-step model of self-objectification by Vandenbosch and Eggermont (2015). The authors postulate that sexualized media predict valuing appearance directly and indirectly via appearance-ideal internalization. Both of these facets then increase body surveillance. This model has been tested with adolescents' traditional media use and general Facebook use (Vandenbosch & Eggermont, 2012, 2015).

Self-Objectification and Gender

Objectification theory was originally developed to describe the experiences of women. Yet, sexualized portrayals of men in the media have increased in past decades, resulting in more pressure for boys to be muscular and look sexy (Vandenbosch & Eggermont, 2013). Research is needed to clarify whether the relations between sexualized media and self-objectification are similar among boys and girls (Moradi, 2010). So far, studies have found that female and male adolescents' use of sexualized traditional media (Vandenbosch & Eggermont, 2012, 2015), and SII use (Skowronski et al., 2020) predict self-objectification via appearance-ideal internalization, with no evidence of a moderating effect of gender. However, these studies did not take the gender of the sexualized media subjects into account, which may also be relevant for the relation between media use and self-objectification. The essential proposition of objectification theory is that women internalize an outside-perspective on themselves because they experience objectification through the sexualization of women (Fredrickson & Roberts, 1997). In the same fashion, men should internalize this perspective through experiences of male sexualization. On Instagram, sexualized women primarily convey the standard of thinness, and research has demonstrated that thin-ideal internalization is an essential variable for girls (Thompson & Stice, 2001). By contrast, male sexualization typically focuses on muscularity and strength (Carrotte et al., 2017). Accordingly, previous studies have shown that exposure to thin-ideal images increases body image concerns in girls, but not in boys (Hargreaves & Tiggemann, 2004). Male body image concerns are more closely linked to the muscular ideal (Thompson & Cafri, 2007). It may thus be reasoned that female images are associated with thin-ideal internalization for girls, and male images are linked to muscular-ideal internalization for boys (Moradi, 2010).

Sexualization on Instagram

Studies that specifically measure the habitual consumption of sexualized images on Instagram are rare. At the same time, Instagram is a purely picture-based platform, and users may encounter images of both peers and celebrities simultaneously on the platform, possibly rendering sexualized images more relevant to their body image concerns (Holland & Tiggemann, 2016). Most importantly, Instagram is known for the wide-spread use of appearance-based hashtags (Tiggemann & Zaccardo, 2018) and its particularly large amount of male sexualized images (Carrotte et al., 2017). Because Instagram is especially popular among teenagers (Medienpädagogischer Forschungsverbund Südwest, 2019), research is needed on links between male and female images on Instagram and adolescents' body image concerns. Examining the differential use of, and pathways from, sexualized male and female images, Instagram is a relevant object of study because it addresses both thinness and muscularity, as reflected in popular hashtags like #thinspiration and #fitspiration (Carrotte et al., 2017; Ghaznavi & Taylor, 2015). Previous studies examining social media either focused on general measures of internalization without differentiating between thinness and muscularity (Vandenbosch & Eggermont, 2015) or did not differentiate between the gender of the sexualized persons (Skowronski et al., 2020). Thus, the proposition that SII of males and females may be differentially associated with thin-ideal and muscular-ideal internalization for girls and boys has not yet been tested.

The Current Study

To address these limitations, the current research measured boys' and girls' use of male and female SII and tested associations in an extended model derived from the three-step self-objectification process (Vandenbosch & Eggermont, 2015). The prediction model is presented in Figure 1. Extending previous research, we predicted gender differences in the relations between male and female SII and facets of internalization. Specifically, we assumed that for girls, female SII would be linked to thin-ideal internalization (Hypothesis 1a) and valuing appearance (Hypothesis 2a), whereas, for boys, male SII would be linked to muscular-ideal internalization (Hypothesis 1b) and valuing appearance (Hypothesis 2b). For both genders, we assumed that valuing appearance would be predicted by thin-ideal internalization (Hypothesis 3) and muscular-ideal internalization (Hypothesis 4). We further assumed that higher thin-ideal, muscular-ideal internalization, and valuing appearance would predict greater body surveillance (Hypothesis 5). Finally, we hypothesized that higher use of gender-congruent SII (female SII for girls, male SII for
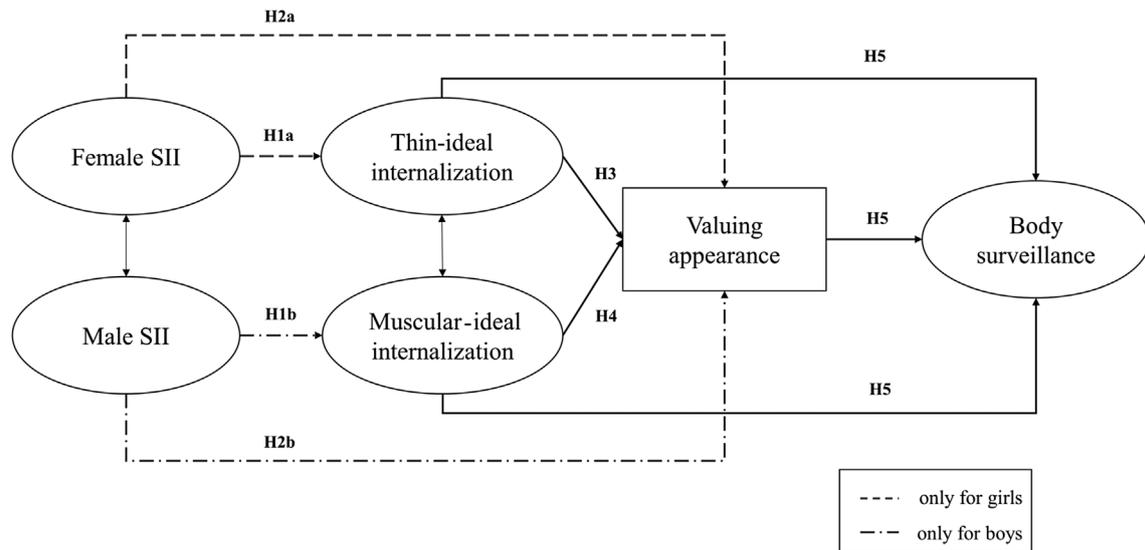
Figure 1. Proposed model of the relation between female and male SII use, thin- and muscular-ideal internalization, valuing appearance, and body surveillance. H1–H6 refer to Hypotheses 1–6.

boys) would be indirectly linked to greater body surveillance via thin-ideal internalization and valuing appearance for girls and via muscular-ideal internalization and valuing appearance for boys (Hypothesis 6).

Method

Participants

Participants were recruited by spreading the link to the online survey via secondary school teachers, youth club leaders, and Instagram. Of the 379 adolescents who started filling in the survey, 313 reached the end of the survey (dropout rate of 17.41%). Thirteen participants were excluded (9 did not specify their gender, 4 did not answer the Instagram questions), resulting in a final sample of $N = 300$ (183 female, 117 male) with a mean age of $M = 15.46$ years ($SD = 1.38$). Participants could opt to take part in a raffle of Amazon vouchers worth 10€.

Instruments

Use of Sexualized Instagram Images (SII Use)

Participants were shown three pictures of sexualized women and three pictures of sexualized men taken from public Instagram profiles. The pictures showed young adults in various forms of scarce clothing and body-emphasizing poses. Pictures were validated in a pilot study (described in the Electronic Supplementary Material,

ESM 1) and are available upon request. For each picture, participants were asked to rate how often they see similar pictures on Instagram on a 5-point scale from 1 (= *never*) to 5 (= *very often*). Participants were told that they should not focus on the specific persons but on the way in which they were presented (e.g., clothing, pose). Cronbach's αs were .85 for the female SII scale and .83 for the male version.

Appearance-Ideal Internalization

The Thin/Low Body Fat and the Muscular/Athletic subscales of the Sociocultural Attitudes Towards Appearance Questionnaire – 4 Revised (SATAQ-4R) were used (Schaefer et al., 2017). Participants rated the extent to which they strive toward appearance ideals on a scale from 1 (= *strongly disagree*) to 5 (= *strongly agree*). The Thin subscale consisted of three items (e.g., "I want my body to be very thin"), α = .84, the Muscular subscale of four items (e.g., "It is important for me to look muscular"), α = .93.

Valuing Appearance

Valuing appearance was assessed by an adapted version of the Self-Objectification Questionnaire (Noll & Fredrickson, 1998; Vandenbosch & Eggermont, 2012). Participants were asked to rate the importance of 10 body attributes (e.g., weight, physical fitness) from 1 (= *not at all important*) to 10 (= *very important*). The difference between participants' mean scores on the appearance-based scale (α = .79) and the competence-based scale (α = .83) determined participant's score of valuing appearance. A factor analysis confirmed the two-factorial structure (see ESM 2).

Body Surveillance

An adapted version for German adolescents of the Surveillance subscale of the Objectified Body Consciousness Scale was used (Knauss et al., 2008; McKinley & Hyde, 1996). The scale consisted of 11 items (e.g., "During the day, I think about how I look many times"), rated on a scale from 1 (= *strongly disagree*) to 4 (= *strongly agree*), α = .84. Following the procedure of previous research (Sevic et al., 2020; Vandenbosch & Eggermont, 2015), four items of the body surveillance subscale were used to create the latent variable.[1]

Control Variable

To control for participants' overall Instagram use, participants indicated on a scale from 1 (= *not at all*) to 7 (= *more than 20 times*) how often they check Instagram on an average day. They further reported how much time they spend on Instagram on a typical day on a scale from 1 (= *no time at all*) to 7 (= *4 hours or more*). The product of frequency and intensity was calculated to yield a score of overall Instagram use.

Procedure

The study was conducted online using the Limesurvey software. After providing informed consent, participants completed the body image measures followed by the Instagram questionnaires, before they were debriefed online. The study was approved by the Ethics Committee of the authors' university.

Overview of Bayesian Analysis

To test our hypotheses, we used the modern Bayesian methodology, which has gained popularity in psychological research (van de Schoot et al., 2017). This approach enabled us to translate our theoretical expectations into prior distributions, which were then incorporated into the analysis to test the probability of the hypothesized model, given the data (Muthén & Asparouhov, 2012). Furthermore, the Bayesian approach offers several advantages over frequentist approaches for evaluating our proposed model: First, it does not rely on large sample sizes. Second, population parameters (e.g., means or regression coefficients) are described by probability distributions, which reflect beliefs about the uncertainty about the population parameters rather than assuming one unknown, but fixed true value, like in frequentist approaches. Third, when examining complex models as in this study, frequentist approaches

often pose overly strict assumptions because they assume exact zero cross-loadings and exact invariance between constructs. By contrast, Bayesian methodology allows for some "wiggle room" by applying prior distributions centered around zero to different parameters and cross-loadings (Winter & Depaoli, 2020).

Results

Descriptive Statistics and Correlations

Differences between boys and girls were tested with SPSS 26 using one-way analyses of variance instead of multivariate analysis of variance, which uses listwise deletion. An α-level of $p < .006$ (.05/8) was used to correct for multiple comparisons. Table 1 displays the descriptive statistics and zero-order correlations for all study variables. Gender differences were found on all variables, with girls scoring higher on all variables except for muscular-ideal internalization, on which boys had higher scores. Male and female SII use significantly correlated with each other and with muscular-ideal internalization for boys and girls. For girls, female SII use correlated with thin-ideal internalization. Female SII use (for boys and girls) and male SII use (for boys) were correlated with body surveillance. SII use and valuing appearance were uncorrelated.

Hypothesis Testing

To examine the proposed paths and gender differences in the associations, the structural equation model presented in Figure 1 was tested using latent class analyses with Mplus 8.5. For female SII, male SII, thin- and muscular-ideal internalization, and body surveillance, the respective items were used as indicators of the latent variables. Due to its rank-order format, we included valuing appearance as a manifest variable in the model. All variables were controlled for general Instagram use and age. Relying on our assumptions, we applied normally distributed zero-mean small variance prior distributions (variance of 0.01) to the differences between factor loadings and item intercepts for boys and girls and to the differences between the paths supposed to be equal for boys and girls, reflecting the assumption that the findings would not vary by gender. The priors of the loadings of the items for SII and internalization on the non-expected latent factor were set to a normally distributed zero mean with small variance (0.01). Uninformative Mplus default priors were applied to all other model parameters.

---

[1] We tested the same model with all items of the body surveillance scale. The results remained unchanged except for a slight decrease in model fit.

Table 1. Zero-order correlations among all variables for girls (above the diagonal) and boys (below the diagonal) and means (*M*) and standard deviations (*SD*s)

	1	2	3	4	5	6	7	8
1. Age		.19**	.19**	.09	.07	.04	.09	.03
2. Instagram use[1]	.07		.18*	.27***	−.01	.01	.09	.13
3. Female SII	.14	.32***		.70***	.25**	.23**	.03	.26***
4. Male SII	.13	.05	.58***		.04	.22**	.02	.13
5. Thin-ideal internalization	.07	.15	−.08	−.03		.31***	.35***	.39***
6. Muscular-ideal internalization	.02	.24*	.30**	.29**	.03		−.03	.24***
7. Valuing appearance	−.03	.06	.00	−.11	.24**	−.05		.44***
8. Body surveillance	.04	.14	.26**	.29**	.18*	.44***	.09	
M (*SD*) for girls	15.56 (1.09)	17.57 (10.63)	3.26 (1.03)	2.43 (1.00)	3.07 (1.05)	2.04 (0.88)	−0.16 (1.74)	3.06 (0.66)
M (*SD*) for boys	15.29 (1.73)	10.81 (9.77)	2.85 (1.19)	1.91 (0.86)	2.11 (0.90)	3.33 (1.05)	−0.88 (1.59)	2.51 (0.66)
F gender difference	2.79	30.76***	10.41**	20.91***	66.21***	131.17***	13.02***	48.02***

Note. SII = use of sexualized Instagram images; Valuing appearance = valuing appearance over competence. [1]Frequency × Intensity. ***$p < .001$; **$p < .01$; *$p < .05$.
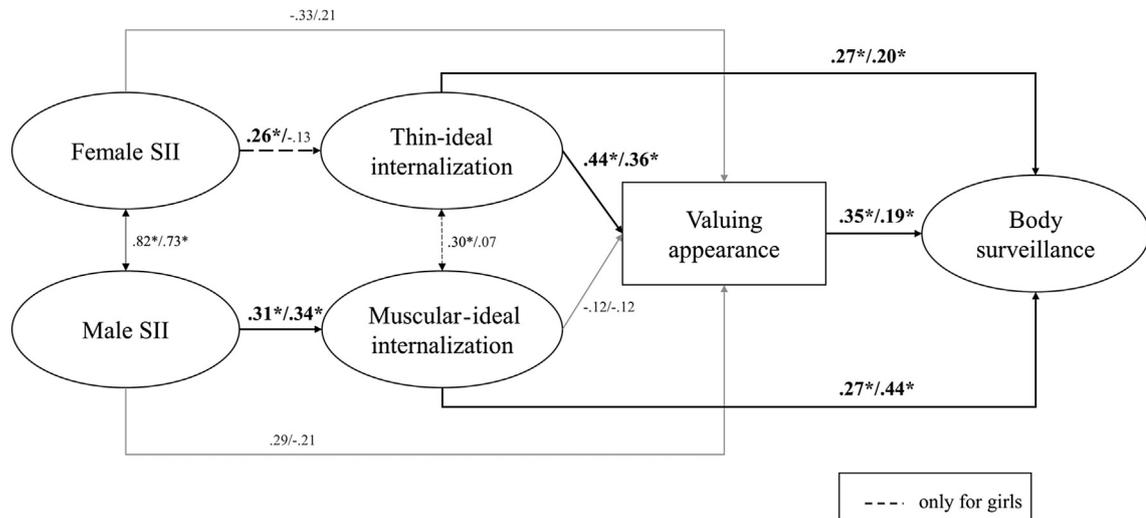
Figure 2. Final model for the relationships between SII use and self-objectification. The first coefficients refer to girls, the second to boys. No coefficients are significantly different. All paths are controlled for overall Instagram use and age. *$p < .05$; Model fit: CFI = .95, RMSEA = .05.

No differences between boys and girls in the factor loadings and item intercepts were significant, indicating approximate strong measurement invariance across gender groups. The model showed a good fit, *PPP* < .001, CFI = .95, RMSEA = .05. The standardized coefficients are presented in Figure 2. To test the significance of both direct and indirect paths, 95% Bayesian credibility intervals were calculated which are presented in Table 2.

Hypothesis 1a that female SII would be associated with heightened thin-ideal internalization for girls, but not for boys was confirmed. Furthermore, male SII was linked to muscular-ideal internalization for boys, consistent with Hypothesis 1b. Against our prediction, male SII also predicted muscular-ideal internalization in girls. The proposed positive paths to valuing appearance from female SII for girls and from male SII for boys were not significant, failing

to support Hypotheses 2a and 2b. As predicted in Hypothesis 3, thin-ideal internalization predicted valuing appearance for girls and boys. However, muscular-ideal internalization did not predict valuing appearance, lending to no support to Hypothesis 4. We further found that thin- and muscular-ideal internalization and valuing appearance predicted body surveillance for boys and girls, consistent with Hypothesis 5. In Hypothesis 6, we proposed indirect links from gender-congruent SII (female for girls, male for boys) to body surveillance via internalization (thin-ideal for girls, muscular-ideal for boys) and valuing appearance. This prediction was supported for girls only. For boys, we found indirect links from male SII to body surveillance only via internalization. We also found evidence that male SII was indirectly linked to body surveillance via muscular-ideal internalization for girls.

Table 2. Direct and indirect paths in the model

	Girls	Boys
Direct paths (standardized)		
Female SII → Thin-ideal internalization	.26* [.10, .42]	−.13 [−.37, .11]
Female SII → Valuing appearance	−.33 [−.78, .09]	.21 [−.14, .60]
Male SII → Muscular-ideal internalization	.31* [.15, .47]	.34* [.12, .54]
Male SII → Valuing appearance	.29 [−.14, .77]	−.21 [−.60, .16]
Thin-ideal internalization → Valuing appearance	.44* [.30, .59]	.36* [.22, .50]
Thin-ideal internalization → Body surveillance	.27* [.10, .43]	.20* [.05, .37]
Muscular-ideal internalization → Valuing appearance	−.12 [−.27, .01]	−.12 [−.30, .06]
Muscular-ideal internalization → Body surveillance	.27* [.13, .41]	.44* [.24, .62]
Valuing appearance → Body surveillance	.35* [.21, .49]	.19* [.01, .36]
Indirect paths (standardized)		
Female SII → Thin-ideal internalization → Body surveillance	.07* [.02, .14]	−.02 [−.09, .02]
Female SII → Valuing appearance → Body surveillance	−.11 [−.29, .03]	.03 [−.03, .15]
Female SII → Thin-ideal internalization → Valuing appearance → Body surveillance	.04* [.01, .08]	−.01 [−.03, .01]
Male SII → Muscular-ideal internalization → Body surveillance	.08* [.03, .16]	.14* [.04, .28]
Male SII → Valuing appearance → Body surveillance	.10 [−.05, .28]	−.03 [−.15, .03]
Male SII → Muscular-ideal internalization → Valuing appearance → Body surveillance	−.01 [−.04, .001]	−.01 [−.03, .004]

Note. SII = use of sexualized Instagram images. Valuing appearance = valuing appearance over competence. *p < .05 [95% Bayesian CI].

Discussion

The current study used objectification theory (Fredrickson & Roberts, 1997) to examine the role of exposure to gendered sexualized images in adolescents' habitual Instagram use for understanding self-objectification. Expanding previous models (Vandenbosch & Eggermont, 2015), we investigated both muscular-ideal and thin-ideal internalization in this relation. Consistent with our hypotheses, female SII use was associated with body surveillance indirectly via thin-ideal internalization and valuing appearance for girls. Furthermore, male SII use was indirectly linked to body surveillance via muscular-ideal internalization for both gender groups. While female images are associated with the thin-ideal for girls, male sexualization highlights the muscular body ideal for both boys and girls. This result might mirror the current shift in female appearance ideals in the context of Instagram: Having a muscular body has become an important trend among girls, and male pictures are presented at a substantial rate in this context (Tiggemann & Zaccardo, 2018). This makes it more likely for girls to internalize the muscular ideal when seeing male sexualized images, which usually emphasize muscularity (Vandenbosch & Eggermont, 2013).

On the whole, our results suggest that sexualization on Instagram might contribute to adolescents' body image concerns, similar to sexualized content in traditional media (Karsay et al., 2018). However, as a social medium, Instagram may have implications for the further development of objectification theory: Users typically follow similar accounts along with their peers, which renders using Instagram a socially shared experience. For instance, users often discuss the bodies of the individuals they see on Instagram, which might intensify the links between sexualized images and self-objectification (Wang et al., 2020). Future research is needed to examine these assumptions. It would further be interesting to test whether body-positive content on Instagram might buffer this proposed effect, as it might lead individuals to question body ideals.

Against our predictions, we did not find direct paths from female and male SII use to valuing appearance. Moreover, we did not find a significant path from muscular-ideal internalization to valuing appearance. A reason may be that valuing appearance reflects the tendency to value appearance attributes like weight and shape, associated with the thin ideal, over competency attributes like fitness and strength, associated with muscularity. If people score high on muscular-ideal internalization, they might not value appearance over competence, or even value the competence attributes over appearance. Overall, our study underlines the need for more research on the concepts of thin- and muscular-ideal internalization and their relevance for valuing appearance.

Limitations

The current study is limited by its correlational design. As such, it cannot support statements about the causal order of the model variables. However, longitudinal and experimental studies confirm the temporal order assumed

in our study (Ward, 2016). Therefore, our results are consistent with the proposition that habitual SII use may negatively affect male and female adolescents' body image. Following Slater's (2007) theory on reinforcing spirals, adolescents with a negative body image might specifically select media high in sexualization. Longitudinal designs are needed to test this possibility. Indeed, recent longitudinal research found evidence for reverse relationships between appearance-ideal internalization and body surveillance (Vangeel et al., 2018). Future research should further control for user variables like body mass index (BMI), which was not assessed in this study. However, some research speaks against the role of BMI as a covariate in the association between sexualized media use and self-objectification (Skowronski et al., 2020).

In sum, our findings provide support for objectification theory (Fredrickson & Roberts, 1997) and the three-step process of self-objectification (Vandenbosch & Eggermont, 2015). They also have theoretical implications for the growing literature on male sexualization and self-objectification. The findings highlight the central and gendered role of appearance-ideal internalization, with muscular-ideal internalization being relevant for boys and both thin- and muscular-ideal internalization being relevant for girls. Therefore, muscular-ideal internalization should be included in future research. Together, the findings show that SII use is linked to body image concerns for both boys and girls, but the relevant stimuli might differ between genders: Female and male sexualized images relate to body image concerns for girls, whereas for boys, male images appear to be more relevant. As male sexualization in the media increases, this is an important finding for intervention programs that should target boys and girls alike and take gendered preferences for sexualized media content into account.

Electronic Supplementary Materials

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1027/1864-1105/a000296

ESM 1. Pilot study
ESM 2. Valuing appearance over competence: Factor analysis

References

Calogero, R. M. (2011). Operationalizing self-objectification: Assessment and related methodological issues. In R. M. Calogero, S. Tantleff-Dunn, & J. K. Thompson (Eds.), *Self-objectification in women: Causes, consequences, and counteractions* (pp. 23–49). American Psychological Association. https://doi.org/10.1037/12304-002

Carrotte, E. R., Prichard, I., & Lim, M. S. C. (2017). "Fitspiration" on social media: A content analysis of gendered images. *Journal of Medical Internet Research, 19*(3), Article 95. https://doi.org/10.2196/jmir.6368

Fredrickson, B. L., & Roberts, T.-A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of Women Quarterly, 21*(2), 173–206. https://doi.org/10.1111/j.1471-6402.1997.tb00108.x

Ghaznavi, J., & Taylor, L. D. (2015). Bones, body parts, and sex appeal: An analysis of #thinspiration images on popular social media. *Body Image, 14*, 54–61. https://doi.org/10.1016/j.bodyim.2015.03.006

Hargreaves, D. A., & Tiggemann, M. (2004). Idealized media images and adolescent body image: "Comparing" boys and girls. *Body Image, 1*(4), 351–361. https://doi.org/10.1016/j.bodyim.2004.10.002

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image, 17*, 100–110. https://doi.org/10.1016/j.bodyim.2016.02.008

Instagram. (2019). *Instagram statistics*. https://instagram-press.com/our-story/

Karsay, K., Knoll, J., & Matthes, J. (2018). Sexualizing media use and self-objectification: A meta-analysis. *Psychology of Women Quarterly, 42*(1), 9–28. https://doi.org/10.1177/0361684317743019

Knauss, C., Paxton, S. J., & Alsaker, F. D. (2008). Body dissatisfaction in adolescent boys and girls: Objectified body consciousness, internalization of the media body ideal and perceived pressure from media. *Sex Roles, 59*(9–10), 633–643. https://doi.org/10.1007/s11199-008-9474-7

McKinley, N. M., & Hyde, J. S. (1996). The objectified body consciousness scale: Development and validation. *Psychology of Women Quarterly, 20*(2), 181–215. https://doi.org/10.1111/j.1471-6402.1996.tb00467.x

Medienpädagogischer Forschungsverbund Südwest. (2019). *JIM-Studie 2019: Jugend, Information, Medien* [JIM study 2019: Youth, information, media]. https://www.mpfs.de/studien/jim-studie/2019/

Moradi, B. (2010). Addressing gender and cultural diversity in body image: Objectification theory as a framework for integrating theories and grounding research. *Sex Roles, 63*(1–2), 138–148. https://doi.org/10.1007/s11199-010-9824-0

Muthén, B., & Asparouhov, T. (2012). Bayesian structural equation modeling: A more flexible representation of substantive theory. *Psychological Methods, 17*(3), 313–335. https://doi.org/10.1037/a0026802

Noll, S. M., & Fredrickson, B. L. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 22*(4), 623–636. https://doi.org/10.1111/j.1471-6402.1998.tb00181.x

Pew Research Center. (2018). *Teens, social media & technology 2018*. http://www.pewinternet.org/wp-content/uploads/sites/9/2018/05/PI_2018.05.31_TeensTech_FINAL.pdf

Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2017). Development and validation of the Sociocultural Attitudes Towards Appearance Questionnaire – 4-Revised (SATAQ-4R). *The International Journal of Eating Disorders, 50*(2), 104–117. https://doi.org/10.1002/eat.22590

Sevic, S., Ciprić, A., Buško, V., & Štulhofer, A. (2020). The relationship between the use of social networking sites and sexually explicit material, the internalization of appearance ideals and body self-surveillance: Results from a longitudinal study of male adolescents. *Journal of Youth and Adolescence, 49*(2), 383–398. https://doi.org/10.1007/s10964-019-01172-2

Skowronski, M., Busching, R., & Krahé, B. (2020). Predicting adolescents' self-objectification from sexualized video game and Instagram use: A longitudinal study. *Sex Roles*. Advance online publication. https://doi.org/10.1007/s11199-020-01187-1

Slater, M. D. (2007). Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity. *Communication Theory, 17*(3), 281–303. https://doi.org/10.1111/j.1468-2885.2007.00296.x

Thompson, J. K., & Cafri, G. (2007). *The muscular ideal: Psychological, social, and medical perspectives*. American Psychological Association. https://doi.org/10.1037/11581-000

Thompson, J. K., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Current Directions in Psychological Science, 10*(5), 181–183. https://doi.org/10.1111/1467-8721.00144

Tiggemann, M., & Williams, E. (2011). The role of self-objectification in disordered eating, depressed mood, and sexual functioning among women. *Psychology of Women Quarterly, 36*(1), 66–75. https://doi.org/10.1177/0361684311420250

Tiggemann, M., & Zaccardo, M. (2018). "Strong is the new skinny": A content analysis of #fitspiration images on Instagram. *Journal of Health Psychology, 23*(8), 1003–1011. https://doi.org/10.1177/1359105316639436

Van de Schoot, R., Winter, S. D., Ryan, O., Zondervan-Zwijnenburg, M., & Depaoli, S. (2017). A systematic review of Bayesian articles in psychology: The last 25 years. *Psychological Methods, 22*(2), 217–239. https://doi.org/10.1037/met0000100

Vandenbosch, L., & Eggermont, S. (2012). Understanding sexual objectification: A comprehensive approach toward media exposure and girls' internalization of beauty ideals, self-objectification, and body surveillance. *Journal of Communication, 62*(5), 869–887. https://doi.org/10.1111/j.1460-2466.2012.01667.x

Vandenbosch, L., & Eggermont, S. (2013). Sexualization of adolescent boys. *Men and Masculinities, 16*(3), 283–306. https://doi.org/10.1177/1097184X13477866

Vandenbosch, L., & Eggermont, S. (2015). The role of mass media in adolescents' sexual behaviors: Exploring the explanatory value of the three-step self-objectification process. *Archives of Sexual Behavior, 44*(3), 729–742. https://doi.org/10.1007/s10508-014-0292-4

Vangeel, L., Vandenbosch, L., & Eggermont, S. (2018). The multidimensional self-objectification process from adolescence to emerging adulthood. *Body Image, 26*, 60–69. https://doi.org/10.1016/j.bodyim.2018.05.005

Wang, Y., Wang, X., Yang, J., Zeng, P., & Lei, L. (2020). Body talk on social networking sites, body surveillance, and body shame among young adults: The roles of self-compassion and gender. *Sex Roles, 82*(11–12), 731–742. https://doi.org/10.1007/s11199-019-01084-2

Ward, L. M. (2016). Media and sexualization: State of empirical research, 1995–2015. *Journal of Sex Research, 53*(4–5), 560–577. https://doi.org/10.1080/00224499.2016.1142496

Winter, S. D., & Depaoli, S. (2020). An illustration of Bayesian approximate measurement invariance with longitudinal data and a small sample size. *International Journal of Behavioral Development, 44*(4), 371–382. https://doi.org/10.1177/0165025419880610

History

Open Data

The authors are willing to share their data, analytic methods, and study materials with other researchers. The material will be available upon request.

Funding

ORCID

Marika Skowronski
 https://orcid.org/0000-0001-7042-8334

Marika Skowronski
Department of Psychology
University of Potsdam
Karl-Liebknecht-Straße 24-25
14476 Potsdam
Germany
marika-skowronski@posteo.de

Marika Skowronski is currently enrolled as a doctoral student in Social Psychology at the University of Potsdam, Germany. Her research examines sexualization in the media and its relation to body image concerns.


Robert Busching is a Post-Doctoral Researcher at the University of Potsdam, Germany. His main research areas are social risk factors for aggressive behavior as well as group influences. Additionally, he is interested in the statistical modeling of behavior.

Barbara Krahé is Professor of Social Psychology at the University of Potsdam, Germany. Her research focuses on media violence, gender stereotypes, and sexual aggression. She is the recipient of the German Psychology Prize 2015 for her work on aggression.

A unique look at the scientific bridges between the fields of clinical psychology and social psychology
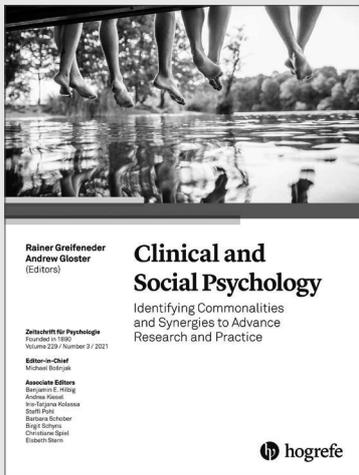
Rainer Greifeneder / Andrew T. Gloster (Editors)

Clinical and Social Psychology

Zeitschrift für Psychologie, vol. 229/3
2021, iv + 52 pp., large format
US $49.00 / € 34.95
ISBN 978-0-88937-596-3

Social interactions are a central component of humans' lives and mental health. Both clinical and social psychology are vibrant fields that address this central topic. However, the advances, contributions, and achievements of each field are often unknown in the other discipline. This volume takes a programmatic stance based on the assumption that there are many commonalities between the two disciplines worth highlighting and synergies to develop and build upon.

Six contributions, authored by experts in the respective fields, look at the intersection of the two disciplines. The authors consider their subject matter from the perspective of both fields and discuss possible implications for clinical and social psychology. Themes explored include ostracism, the role of perceptions of treatment in clinical outcomes, rejection sensitivity in relationships, coping with experienced injustice, and the link between mimicry and lying, as well as a theoretical overview of synergies between the two fields. The articles are insightful, exciting, and synergistic.

Contents and topics include

- The Centrality of Human Interaction: Shared Paths and Synergistic Opportunities for Clinical and Social Psychology
- Attending to the Ignored: Clinical Implications of Social Psychological Research on Ostracism
- Rejection Sensitivity in Intimate Relationships: Implications for Perceived Partner Responsiveness
- Cures That (Make You) Work: How a Treatment's Social Role Affects Health-Related Behavioral Intentions
- Imagery Rescripting Helps Victims Cope With Experienced Injustice
- You Want to Know the Truth? Then Don't Mimic! The Link Between Mimicry and Lying

www.hogrefe.com

hogrefe

Instructions to Authors

Journal of Media Psychology (JMP) is committed to publishing original, high-quality papers which cover the broad range of media psychological research. This peer-reviewed journal focuses on how human beings select, use, and experience various media as well as how media (use) can affect their cognitions, emotions, and behaviors. It is also open to research from neighboring disciplines as far as this work ties in with psychological concepts of the uses and effects of the media. In particular, it publishes multidisciplinary papers that reflect a broader theoretical and methodological spectrum and comparative work, e.g., cross-media, cross-gender, or crosscultural. As *JMP* is intended to foster Open Science Practices, authors are offered to publish their data and materials (i.e., stimuli and surveys) as Electronic Supplementary Material on the publisher's website at http://econtent@hogrefe.com. In line with the Peer Reviewers' Openness Initiative, authors may be asked by reviewers to share their data and materials at any stage of the reviewing process.

***Journal of Media Psychology* publishes the following types of article:** Original Articles, Theoretical Articles, Research Reports, Pre-Registered Reports.

Manuscript submission: All manuscripts should in the first instance be submitted electronically at http://www.editorialmanager.com/jmp. Detailed instructions to authors are provided at http://www.hgf.io/jmp

Copyright Agreement: By submitting an article, the author confirms and guarantees on behalf of themselves and any coauthors that the manuscript has not been submitted or published elsewhere, and that they hold all copyright in and titles to the submitted contribution, including any figures, photographs, line drawings, plans, maps, sketches, and tables, and that the article and its contents do not infringe in any way on the rights of third parties. The author indemnifies and holds harmless the publisher from any third party claims. The author agrees, upon acceptance of the article for publication, to transfer to the publisher the exclusive right to reproduce and distribute the article and its contents, both physically and in nonphysical, electronic, or other form, in the journal to which it has been submitted and in other independent publications, with no limitations on the number of copies or on the form or the extent of distribution. These rights are transferred for the duration of copyright as defined by international law. Furthermore, the author transfers to the publisher the following exclusive rights to the article and its contents:

1. The rights to produce advance copies, reprints, or offprints of the article, in full or in part, to undertake or allow translations into other languages, to distribute other forms or modified versions of the article, and to produce and distribute summaries or abstracts.
2. The rights to microfilm and microfiche editions or similar, to the use of the article and its contents in videotext, teletext, and similar systems, to recordings or reproduction using other media, digital or analog, including electronic, magnetic, and optical media, and in multimedia form, as well as for public broadcasting in radio, television, or other forms of broadcast.
3. The rights to store the article and its content in machinereadable or electronic form on all media (such as computer disks, compact disks, magnetic tape), to store the article and its contents in online databases belonging to the publisher or third parties for viewing or downloading by third parties, and to present or reproduce the article or its contents on visual display screens, monitors, and similar devices, either directly or via data transmission.
4. The rights to reproduce and distribute the article and its contents by all other means, including photomechanical and similar processes (such as photocopying or facsimile), and as part of so-called document delivery services.
5. The right to transfer any or all rights mentioned in this agreement, as well as rights retained by the relevant copyright clearing centers, including royalty rights to third parties.

Online Rights for Journal Articles: Guidelines on authors' rights to archive electronic versions of their manuscripts online are given in the "Guidelines on sharing and use of articles in Hogrefe journals" on the journal's web page at http://www.hgf.io/jmp

January 2021

Up-to-date research on what factors make memory monitoring more accurate
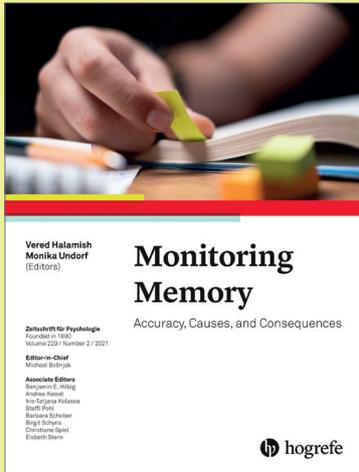
Vered Halamish / Monika Undorf (Editors)

Monitoring Memory

Humans have a remarkable ability to learn and remember information, but, unfortunately, we are also prone to forgetting and other memory flaws, such as false memories. Metamemory monitoring during learning is the process learners use to assess the likelihood that they can recall studied material and to judge what material they need to spend more time learning. This volume explores the factors that predict monitoring accuracy during learning, the strategies used to increase accuracy, and the consequences of monitoring accuracy for learning outcomes.

Included are a systemic review of the research on strategies that help students to accurately monitor their learning and understanding in educational settings; an experimental exploration of the boundary conditions for the beneficial effects of highly accurate monitoring of learning on self-regulation and performance; and examinations of the relations between characteristics of learning and memory (e.g., errorful generation) and the accuracy of metamemory monitoring.

Contents and topics include

- Accuracy, Causes, and Consequences of Monitoring One's Own Learning and Memory
- Improving Metacognition in the Classroom
- Why Does Excellent Monitoring Accuracy Not Always Produce Gains in Memory Performance?
- On the Role of Generation Rules in Moderating the BeneficiaEffects of Errorful Generation
- The Influence of Prior Knowledge on Memory and Metamemory for Famous Names and Faces: A Dual-Process Approach

www.hogrefe.com

ⓑ hogrefe

A compact guide to the assessment and treatment of Internet addiction

"This excellent book is a pleasure to read. At a time when clinicians are scrambling to learn what they can about the rapidly developing problem of Internet addiction, this book offers them an excellent place to start."

Hilarie Cash, PhD, Chief Clinical Officer and Co-Founder of reSTART Life, PLLC, Fall City, WA – the first residential treatment program for Internet addiction in the US
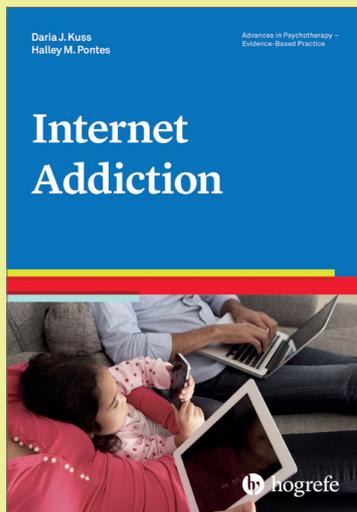
Daria J. Kuss / Halley M. Pontes

Internet Addiction

Advances in Psychotherapy –
Evidence-Based Practice, vol. 41
2019, iv / 86 pp.
US $29.80 / € 24.95
ISBN 978-0-88937-501-7
Also available as eBook

This book examines how you can identify, assess, and treat Internet addiction in the most effective manner. Internet use has become an integral part of our daily lives, but at what point does it become problematic? What are the different kinds of Internet addiction? And how can professionals best help clients? This compact, evidence-based guide written by leading experts from the field helps disentangle the debates and controversies around Internet addiction, including social media addiction and Internet gaming disorder, and outlines the current assessment and treatment methods. The book presents a 12–15 session treatment plan for Internet and gaming addiction using the method and setting with the best evidence: group CBT. Printable tools in the appendix help clinicians implement therapy. This accessible book is essential reading for clinical psychologists, psychiatrists, psychotherapists, counselors, social workers, teachers, researchers, as well as students and parents.

www.hogrefe.com

ⓗ hogrefe