Source does matter: contextual effects on online media-embedded health campaigns against childhood obesity

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Source does matter: Contextual effects on online media-embedded health campaigns against childhood obesity

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ABSTRACT

Provocative messages targeting childhood obesity are a central means to increase problem awareness. But what happens when different online media platforms take up the campaign, comment, re-contextualize, and evaluate it? Relating to preliminary findings of persuasion research, we postulate that source credibility perceptions vary across types of online media platforms and contextualization of the message. Individual characteristics, in particular weight-related factors, are assumed to influence message effects. A 3 (media type: blog, online news, *Facebook*) $\times$ 2 (reinforcement versus impairment context) experimental design with students (N = 749) aged between 13 and 18 years was conducted. Results show an interaction between media type and argumentation for affective self-perceptions of weight. Self-relevance varies based on different source credibility perceptions. Overall, campaign re-contextualization of provocative messages may result in negative persuasion effects and needs to be considered in campaign development.

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1. Introduction and theoretical background

Childhood anti-obesity campaigns are often designed in a highly provocative way in order to increase attention. Social media platforms are a prominent online environment to spread such health-related public service announcements, raise awareness and motivate discussion. However, when applying this strategy, public healthcare runs the risk of losing control over the effects of its campaigns. Follow-up communication in different media platforms such as blogs, online news sites or social networking sites takes up the campaign, comments, re-contextualizes, and evaluates it. On the one hand, this strengthens the attention focused on the campaign, on the other hand, the question emerges how different context formats affect campaign perceptions. Even if the core messages of the campaigns are still equal, variations in the argumentative contextualization and the media platform change the representation of the message, or, in other words, the frame of the

message (for an overview see Entman, 1993; Iyengar, 1991). In terms of how campaigns are embedded, two aspects stand out. First, the contextualization of the content could either reinforce the argumentation of the campaign or impair its original message. The arguments of the original message are either supported or rejected, which resembles value framing in political communication (Schemer, Wirth, & Matthes, 2012).

Second, follow-up communication regarding the campaigns could be placed on different online media platforms, reaching from more traditional journalistic contexts, such as online newspapers, to social-media environments, such as *Facebook* or blogs. Both re-contextualization factors address the credibility and trustworthiness of the context, the message and of the communicator (e.g., Hovland & Weiss, 1951; Park & Cameron, 2014). However, research has failed to analyze the comparative effects of social campaigns in these different online media environments.

A highly relevant example in regard to such concerns is the perception of obesity-related health messages, especially when these campaigns address children and adolescents, since such campaigns are increasingly at risk of offending and stigmatizing children affected by obesity. However, there is little research on the effects of campaigns against childhood obesity and the fact that

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they [can] convey negative or even shocking messages in online media. Considering the lack of research on this subject, our study aims to close the gap and investigate the effects of different types of context embedment on a controversial health campaign for source credibility perceptions. The object of inquiry in this study is the 2012 *Children's Healthcare of Atlanta* (*CHOA*) campaign *Strong4Life*, which triggered a highly controversial discussion in the United States, since it uses children talking about their own stereotyping. Our research is based on the assumption that especially such controversial campaigns disseminated via online media run the risk of being re-contextualized, at worst with the original communicators' intentions being jeopardized. In our study, we experimentally manipulated the embedment of the Strong4Life social health campaign, varying different online media environments (Facebook, blogs, online newspaper) and context argumentation (reinforcing or impairing). In contrast to message-centered empirical designs, we manipulated source-relevant information of the media environment (Metzger, 2007).

1.1. Obesity as an individual and a social challenge

Obesity and excess weight are issues of high social relevance (Dietz et al., 2015; Lobstein et al., 2015). At the beginning of the twenty-first century, the *World Health Organization (WHO)* determined that the spread of obesity was progressing at an alarming rate (WHO, 2000, p. 16). In industrialized nations in particular, the WHO predicted an almost epidemic spread of problems connected to excess weight and obesity. The problem started in the adult population, but in recent years it has increasingly shifted to the younger portion of the population (Lobstein et al., 2015). For several years, the number of overweight and obese children increased worldwide. In almost all *OECD* and emerging countries around 20% of all children between the ages of 5 and 17 years are now considered to be obese or affected by excess body weight (OECD, 2012).

The consequences of this problem are no less than dramatic on both individual and social levels. It is not surprising that Linda Matzigkeit, senior vice-president of CHOA, wanted to confront the problem directly: "We needed something that was more arresting and in your face than some of the flowery campaigns out there - If we do not wake up, this will be disastrous for our state" (Hasan, 2012). The campaign that started in 2011 consists of posters showing close-ups of four overweight children in black and white with the word "Warning" written in large red letters, and television spots. In these black and white spots, the four children come to speak in short and poignant sentences about their problems: stigmatization, exclusion, fear of death and disease. In spring 2012, the campaign was finally covered by the media (Grinberg, 2012). In addition to newspapers, radio and television stations, numerous blogs and online newspapers also addressed the issue and offered space for further debate. For example, a single article on this subject in the online newspaper *Huffington Post* was followed with 1336 comments from readers. The goal to get people talking (Teegardin, 2011), and thus to highlight the perceived relevance of the problem, was achieved by the CHOA, even though opinions were not always positive concerning the organization and its campaign. The provocative message sharpens the problems posed by childhood obesity, but has to deal with the fact that people may perceive the message as exaggerated and untrustworthy. It therefore seems plausible to assume that embedding these campaigns in reinforcing argumentation in line with the core message increases the relevance perceptions of the audiences. It is assumed that an impairing contextualization on the other hand highlights doubts about the credibility of the message and the urgency of the problem, which should result in reduced self-relevance perceptions. However, research has shown that weight as well as body image play a vital

role in an individual's perception of body size or obesity-related communication (Anderson & Bresnahan, 2013). Children and adolescents in particular are associated with the detrimental effects of media-promoted body ideals (Tiggemann, 2014), yet effects of anti-obesity campaigns on underweight or normal-weight recipients are hardly researched (Smeesters, Mussweiler, & Mandel, 2010). We are therefore interested in the adverse effects of anti-obesity messages on children's and adolescents' self-perception of weight, and the perceived self-relevance of these campaigns.

1.2. Source credibility

Source credibility is a decisive and extensively researched factor for the evaluation of the likelihood of peripheral route elaboration in connection with persuasive messages (Petty & Briñol, 2008). However, when source credibility is addressed in communication research, designs mainly focus on the relation between a communicator and a message's argumentative strength in line with Hovland and Weiss (1951) tradition of researching the salience of source expertise or source trustworthiness. In accordance with this, recipients evaluate a message depending on the issue itself, the strength of arguments within the message, and their perception of the source. "Attitude change is an increasing monotonic function of message-discrepancy (Anderson & Hovland, 1957; McGuire, 1969, p. 223), except where polarity, absolute bounds, or strong counterarguing effects prevail" (Hamilton, Hunter, & Boster, 1993, p. 52). While these intervening variables were generally accepted as content-inherent boundaries in regard to elaboration likelihood, the prevalence of source-related context variables was hardly addressed (e.g. type of medium).

The conceptual basis of a communicator's credibility – as an information source – refers to personal prestige (Hastak & Park, 1987; Hovland & Weiss, 1951). It is thus based on face-to-face or para-social assumptions of personal trust rather than on structural cues that relate to the media-source or to contextual information, such as accompanying text or comments that allow recipients to evaluate a message's relevance. Apart from empirical evidence, the concept of source credibility faces conceptual challenges when online as well as social media are affected. The establishment of source credibility based on personal interactions is improbable in an online environment. "People use simple heuristic cues or informational indicators, such as source credibility, to assess the believability of a message" (Chung, Sia, & Kuan, 2012, p. 620). Advertising research in particular has shown a long-term interest in source-related information processing (McGuire, 1969; Scholten, 1996). A great body of these studies focuses on platform-related effects on source credibility or contextual effects which depend on a persuasive message's environment, such as accompanying content, advertisements or user-generated content (Areni, Ferrell, & Wilcox, 2000; Jones, Sinclair, & Courneya, 2003; Wathen & Burkell, 2002). In various media types persuasive messages are *embedded* in programs, e.g. television advertisements, newspaper advertisements or radio campaigns. Perceptions of competing messages of different style and type depend on constraints of platform characteristics and implications result from source imputation, when shared or user-generated content is the focal point. Frewer, Howard, Hedderley, and Shepherd (1997, p. 760) therefore emphasize the importance of investigating "credibility effects in realistic and ecologically valid contexts if the true effects of information source credibility are to be assessed".

The previously addressed aspects also find support from authors in information science. Among others, Olaisen (1990) differentiates between factors classically related to source credibility versus design features of the medium in order to distinguish "cognitive" and "technical" qualities that mediate recipients' perceptions of

credibility. Such a definition refines information quality judgments not solely by the message itself, but by the context in which a persuasive appeal appears, considering technical quality as a set of relevant factors of message embedment (Rieh & Danielson, 2007; Wathen & Burkell, 2002). Focusing on an extended source credibility framework that addresses contextual aspects of the embedding of a persuasive appeal, our study proposes that context type and media credibility are at the core of recipients' message evaluation. Our framework consequently focuses on the measurement of source credibility, (1) as a person-related attribute of a communicator as well as of a producer of a media offer (website and video), (2) as a feature of the medium itself, the specific type of site (news, blog or social media), and (3) as the credibility evaluation of the embedded anti-obesity campaign-video. As cognitive and technical qualities refer to quite different characteristics of a message and its medium, we assume that separate and independent measures are necessary in order to reveal the complexity of a source's trustworthiness as well as the assessment of a communicator or medium's expertise (Ohanian, 1990). Thus, the aim to assess perceptions of source credibility for re-contextualization processes in online environments needs to take these versatile medial conditions into account. In the following, we provide further information on these conditions.

1.2.1. Argumentative tonality and attitudes

Recent research on the influence of media context as a situational factor of persuasive message elaboration (Aylesworth & Mackenzie, 1998; De Pelsmacker, Geuens, & Anckaert, 2002; Janssens, De Pelsmacker, & Geuens, 2012; Lynch & Stipp, 1999) showed congruency effects of placements and surrounding media content. Predominantly, two main lines of argumentation state either an effect of the thematic congruency (Janssens et al., 2012; Moorman, Willemsen, Neijens, & Smit, 2012; Perry et al., 1997) or mood congruency (Aylesworth & Mackenzie, 1998; Bower, 1991; Bower & Forgas, 2000; Fiedler & Bless, 2000) between the embedded messages and the surrounding information or tonality of the medium. Thematic as well as mood congruency as situational factors of media exposure showed significant effects on recipients' attitudes and behavior when the media content supported the placements' messages. Apart from advertising research, especially internet-based information on health-related issues has become a research topic of contextual congruency in media exposure (Hu & Sundar, 2010; Jin, Phua, & Lee, 2015; Phua, 2014; Jin et al., 2015). We argue that an embedded health message targeting childhood obesity benefits from surrounding media content that reinforces the statements within the placement. This leads to the following hypotheses:

Hypothesis 1a. In contrast to negative contextual argumentation (impairment), we predict a more positive change in self-perception of weight when the embedded health message is positively accompanied (reinforcement) by the contextual content.
Hypothesis 1b. In contrast to negative contextual content (impairment), we predict a more highly perceived self-relevance of the message when the embedded health message is positively accompanied (reinforcement) by the contextual content.

1.2.2. Internet-based information credibility and attitudes towards health

Internet-based health information appears in a variety of contexts, evaluations, and credibility-related issues. In regard to this growth of information sources, research has shown that internet-based information seeking is oriented by well-known

expectations towards the media, namely classical gatekeeping (Flanagin & Metzger, 2007) or social expectations towards content that is generated by recipients' own peer groups (Jin et al., 2015). Furthermore, in preceding research (Zurstiege, Meitz, & Ort, 2014), we identified that the thematization of the Strong4Life campaign was evaluated quite differently by media users in regard to the argumentative structure of user commentaries. In contrast to commenting on social media sites, our content analysis revealed a significant adoption of the argument structure of the source when users commented on online news sites. We assume that this reproduction of arguments depends on the trustworthiness of the source. Whereas online news sites refer to the credibility of "visible" (Hu & Sundar, 2010, p. 2) journalistic media, blogs and social media like Facebook miss this gatekeeping function of traditional mass media (Callister, 2000; Eastin, 2001; Metzger, Flanagin, & Medders, 2010). Concerning the differing media types (online news, blogs, and Facebook), the following hypotheses are posited:

Hypothesis 2a. In contrast to Facebook and blogs, embedded campaigns in online news (displaying journalism-oriented formats) lead to a more positive self-perception of weight.
Hypothesis 2b. In contrast to Facebook and blogs, embedded campaigns in online news (displaying journalism-oriented formats) increase self-relevance perceptions of the message.

1.2.3. Source credibility as a mediator

As our previous argumentation suggests, the trustworthiness of online sources plays a pivotal role in recipients' assessment of information sources and these expectation-based assessments in turn affect attitudes towards health. Furthermore, we assume that re-contextualized health campaigns highly depend on recipients' heuristic processing (Metzger et al., 2010; Metzger, Flanagin, Markov, Grossman, & Bulger, 2015) of specific medium-related cues and contextual factors. Thus, the estimation of credibility is regarded as a mediator of message effects (Hilligoss & Rieh, 2008). This leads to the following hypothesis and research question:

Hypothesis 3a. The effect of reinforcement on self-relevance is mediated by source credibility.
RQ1. Is the effect of different media platforms on self-relevance perceptions mediated by source credibility ratings?

2. Method

A 3 (media platform: blog vs online news vs Facebook) × 2 (argumentative contextualization: reinforcing vs impairing) between-subjects design was conducted in order to test the proposed hypotheses. To investigate changes in self-perceptions of weight, pre-post measures were realized.

2.1. Participants

After approval from an ethical committee and the German federal state of Baden-Württemberg's Ministry of Culture, Youth, and Sport, different types of schools (secondary modern schools, middle schools, and grammar schools) were contacted and asked to take part in the study. A total of 922 students participated in the preliminary questionnaire of which 749 students participated in both parts of the study. The mean age of the participants was 14.60 ($SD = 1.11$). With respect to gender, 55.3% ($N = 414$) were female and 44.7% ($N = 335$) were male. Students attended grammar schools ($N = 326$), secondary schools ($N = 327$) or modern secondary schools ($N = 97$). Secondary school types differ in their request of primary school grades, with grammar schools requesting marks above average, secondary schools

average primary school grades and secondary modern school marks below average. Our sample approximately resembled the overall proportional distribution of students across those different school types within the German federal state of Baden-Württemberg where the study was conducted.

2.2. Materials

The Strong4Live Anti-Childhood-Obesity campaign released by the Children's Healthcare in Atlanta in 2012 is one example of a very critical campaign that received much attention and was controversially discussed in several online media platforms. Therefore, the campaign is a prototype of a controversial health message that is of theoretical interest in this study. Based on the high media coverage, two advantages emerged: 1. Since the campaign evoked strong online commentaries in blogs, social-networks as well as online newspaper websites, we were able to extract realistic arguments regarding the campaign for an impairing as well as a reinforcing context on different platforms. 2. The campaign did not run in Germany, therefore prior knowledge effects regarding media contextualization of the specific campaign were very unlikely.

2.2.1. Development of stimulus websites

A pilot study was conducted in order to develop stimulus material resembling a realistic coverage of blogs, online news sites and Facebook with regard to the campaign. On the basis of a quantitative content analysis ($N = 61$ blogs, $N = 39$ online news sites, and $N = 5541$ user comments), we were able to show that there are clear differences in the thematic framing of the initial campaign. Results indicated that differences occur concerning tonality as well as the thematic spectrum with which different types of media address the subject (Zurstiege et al., 2014). Besides embedment that formally corresponds with different online media platforms, a general tendency is either a reinforcing or impairing contextualization. While reinforcing comments use the campaign as a foundation to strongly emphasize the need to act against increasing childhood obesity by all means, impairing argumentations also emphasize the importance of prevention against childhood obesity, but question the strong means of the campaign from an ethical point of view. This difference manifests itself in either a strong "*we have to act*" or a "*we should act, but in an ethical way*" argumentation (Zurstiege et al., 2014). On the one hand, a reinforcing argumentation evaluates the campaign as a good means to attract interest and attention towards a health problem that receives insufficient support from the state, politics, families or the economy. On the other hand, the impairing argumentation emphasizes the problem as being highly relevant and needing increased attention, but evaluates the campaign as ethically disputable since it includes an unnecessary and inadequate denunciation of children.

2.2.2. Experimental treatment conditions

Relating to the pilot study, three online platforms (a blog, an online news site and a Facebook profile/timeline) were developed for the online experiment. In addition, two versions of each site containing varying argumentative contextualization (impairing or reinforcing) based on the extracted arguments from the content analysis, were designed. Sites consisted of a teaser of the manipulated article (blog, online news) or profile information pages (Facebook) with a timeline and different postings. Articles and postings were of comparable sizes (about 350 words) and contained the same key information that was adjusted to specific media requirements, e.g. a more personalized writing style on the blog and Facebook page compared to online news. On each site, participants were able to see a motif of the campaign with a translated slogan as well as a synchronized version of the

campaign's video spot that were both created for this study. To eliminate gender effects, participants were randomly assigned to two versions of the six stimulus versions where they either saw the poster with a girl and the spot with a boy or vice versa. To control effects of different sources on judgments, articles and postings were presented with the same information about the author.

To vary argumentative contextualization, the title of each site as well as the last paragraph were formulated in a reinforcing or impairing way. While the reinforcing title emphasized the attention-grabbing function of the campaign ("New anti-obesity campaign as reality check for Baden-Württemberg"), the impairing title emphasized the stigmatization in the ads ("Shame and guilt: Baden-Württemberg's dim anti-obesity campaign"). In the last paragraph of the reinforcing article and posting it was stated that the campaign was the right way to attract attention against obesity and that it would be only a question of time until health benefits were visible. To support the argument, it was said that former campaigns in a provocative style were very effective when it came to improving health behavior. In contrast, the impairing articles and postings criticized the provocative style of the campaign as a means that goes too far. It was stated that stereotyping of obese children could be increased by the campaign, giving these children a hard time.

2.3. Procedure

The main study was designed as an experiment with two times of measurement. Participating schools were asked to hand out information about the study to 7th and 8th grade students (students in these grades are usually between 12 and 14 years old) and their parents − for ethical as well as organizational reasons students from lower and higher grades were precluded from the study. After the students' and parents' consent was obtained, questionnaires for the first part of the study (including socio-demographic and health-related measures as well as cognitive and affective self-perceptions of weight) were distributed by teachers. Two weeks later, the second part of the study was carried out in the computer labs of the schools. Participants were instructed to sit in front of a desktop computer to complete the survey. They were randomly assigned to one of six stimuli for the online experiment (*EFS Survey*). After viewing the website, participants were asked to complete an online questionnaire on their computer, which included source credibility perceptions, self-relevance measures and again cognitive and affective self-perceptions of body image.

2.4. Measures

2.4.1. Source credibility

Five dimensions of source credibility concerning the credibility of the presented author, expertise of the video and the site as well as trustworthiness of the video and the site were measured. To access the perceived credibility of the author, six semantic differential items (Lutz, McKenzie, & Belch, 1983) ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*) were used, e.g. "honest−dishonest" ($M = 5.47$, $SD = .91$, $\alpha = .86$). Participants were asked to rate their credibility perceptions of the site and the video on trustworthiness and expertise as two dimensions of source credibility (Ohanian, 1990). To improve the validity of the original 5−item subscales, three more items were added to the expertise as well as the trustworthiness scale. Trustworthiness was measured with eight semantic differential items ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), e.g., "reliable−unreliable", "truthful−untruthful" (trustworthiness$_{site}$: $M = 5.38$, $SD = .91$, $\alpha = .89$; trustworthiness$_{video}$: $M = 5.26$, $SD = 1.08$, $\alpha = .91$). In a similar vein, expertise was measured with eight items, e.g. "qualified−unqualified", "skilled−unskilled" (expertise$_{site}$: $M = 5.49$,

$SD = .97$, $\alpha = .91$; expertise$_{\text{video}}$: $M = 5.30$, $SD = 1.02$, $\alpha = .90$).

2.4.2. Health related attitudes: cognitive and affective self-perceptions of weight, self-relevance of the message

A six-item scale by Deusinger (1998), ranging from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*) was used to address students' cognitive self-perceptions of weight. Participants rated their level of agreement with statements such as "I've got more bodily flaws than others", or "I look quite good" ($M_{t1} = 4.00$, $SD_{t1} = .98$, $\alpha_{t1} = .72$; $M_{t2} = 4.03$, $SD_{t2} = .95$, $\alpha_{t2} = .71$). To assess changes over time, we calculated the difference between both times ($M = .04$, $SD = .73$). Affective perceptions of weight were measured by applying a discrete emotions-based scale by Sassenberg, Fetterman, Krebs, and Neugebauer (2014). Students rated 6 items about weight-related emotions on a 5-point scale, ranging from 1 (*Not At All*) to 5 (*Completely*), e.g. "concerned", "proud", "anxious" ($M_{t1} = 3.77$, $SD_{t1} = .88$, $\alpha_{t1} = .84$; $M_{t2} = 3.84$, $SD_{t2} = .81$, $\alpha_{t2} = .83$). Again, to assess changes over time, we calculated the difference between measurement times one and two ($M = .07$, $SD = .73$).

To assess self-relevance, participants were asked to evaluate the messages on 11 items of the Evaluation Judgment Scale by Burke and Edell (1989), ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*), e.g., "interesting", "relevant", or "useful" ($M = 4.53$, $SD = .85$, $\alpha = .78$).

3. Results

3.1. Effects of context argumentation and media type on health-related attitudes

Hypotheses 1a and 1b predict that message characteristics influence affective and cognitive self-perceptions of weight as well as self-relevance perceptions. Hypotheses were tested with three ANCOVAS, controlling for BMI, age and gender (Table 1).

For affective self-perceptions of weight ($F(8, 714) = 2.45$, $p < .05$, $\eta_p^2 = .03$), context argumentation ($F(1, 714) = 2.69$, $p < .05$, $\eta_p^2 = .01$) emerged as a significant predictor. In contrast to our predictions of H1a, impairment significantly increased positive affective self-perception of weight compared to a reinforcement strategy. Affective self-perception of weight did not differ among the three media types ($F(2, 714) = .26$, $p = .78$). However, the interaction of context argumentation and type of medium was significant ($F(2, 714) = 3.32$, $p < .05$, $\eta_p^2 = .01$). As shown in Fig. 1, argumentative contextualization was not relevant for blogs. However, on Facebook and in online news, an impairing argumentation considerably increased self-perceptions of weight in contrast to reinforcing contexts ($p < .05$). These interactions partly reject hypothesis 1a since an impairing argumentation strategy successfully increased affective self-perceptions on Facebook and in online news, but not in blogs. The fact that an impairing context argumentation as opposed to a reinforcing context argumentation reduced affective self-perceptions of weight could only be observed in connection with blogs. Additionally, the BMI ($F(1, 714) = 3.54$, $p < .01$, $\eta_p^2 = .01$) had a significant influence on self-perceptions of
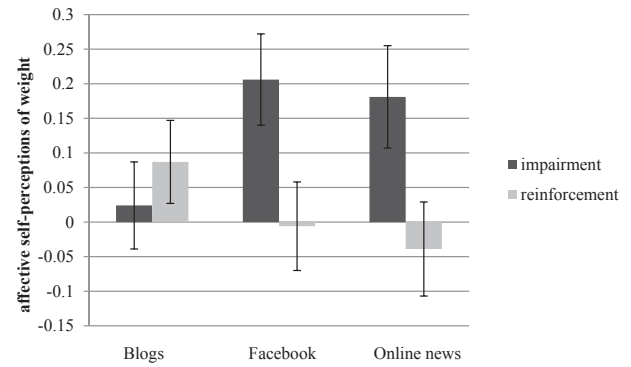

Fig. 1. Interaction of media type and context argumentation on affective self-perceptions of weight. Error bars indicate the SE.

weight ($r = .08$, $p < .05$). Age and gender did not have a significant effect on differences in affective self-perception.

For changes in cognitive self-perceptions of weight, neither context argumentation nor type of media or other variables showed any significant influence ($F(8, 716) = .63$, $p = .75$). Thus, H1a and H2a need to be rejected for cognitive self-perceptions of weight.

In terms of self-relevance perceptions, the results showed that context argumentation ($F(1, 716) = 5.12$, $p < .01$, $\eta_p^2 = .01$) and type of medium ($F(2, 716) = 4.80$, $p < .05$, $\eta_p^2 = .01$) significantly predicted relevance evaluation (see Fig. 2). In line with H1b, a reinforcing argumentation strategy resulted in increased self-relevance perceptions. Messages on Facebook were perceived as significantly less relevant than messages presented in a blog ($p < .05$). Relevance perceptions for online news ($p = .058$) were marginally higher than for Facebook. This partially supports H2b, stating that the traditional media context of online news should result in higher perceptions of
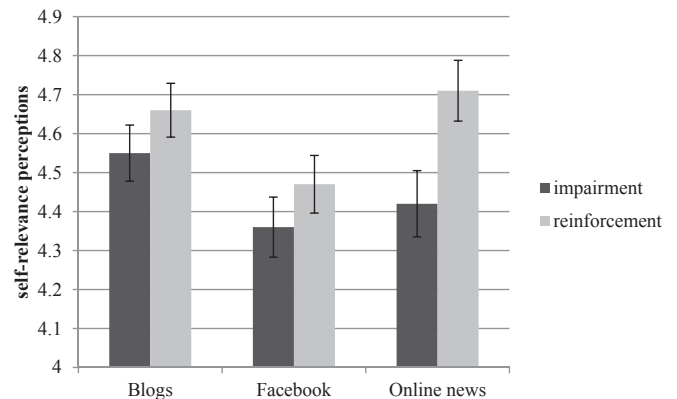

Fig. 2. Effects of media type and context argumentation on self-relevance perceptions. Error bars indicate the SE.

Table 1
Means and standard deviations in brackets by media platform and context argumentation.

Variable	Blogs		Facebook		Online news	
	Reinforcement $N = 145$	Impairment $N = 137$	Reinforcement $N = 130$	Impairment $N = 121$	Reinforcement $N = 117$	Impairment $N = 98$
Affective self-perceptions of weight	.09 (.67)	.03 (.78)	.00 (.70)	.20 (.70)	−.05 (.73)	.18 (.75)
Cognitive self-perceptions of weight	.01 (.83)	.02 (.70)	.04 (.78)	.06 (.84)	−.02 (.73)	.11 (.82)
Self-relevance	4.65 (.92)	4.55 (.93)	4.70 (.79)	4.45 (.81)	4.49 (.78)	4.35 (.84)

relevance than Facebook as a popular social media context. Blogs were evaluated relatively similarly to online news. One explanation may be that blogs are not predominantly associated with social-media characteristics, but share credibility attributes with online news. Additionally, gender had a significant influence on self-relevance perceptions ($F(1, 716) = 28.20$, $p < .001$, $\eta_p^2 = .01$). A t-test showed that women ($M = 4.70$, $SD = .83$, $t(719.62) = -6.24$, $p < .001$) perceived the messages as more self-relevant than men ($M = 4.32$, $SD = .82$). The BMI, age as well as the interaction of context type and type of medium did not show significant effects.

3.2. Mediation effects of context argumentation on self-relevance perceptions through source credibility

Hypothesis 3a predicted that the effect of context argumentation on self-relevance is mediated by source credibility perceptions. In order to analyze multiple mediation relationships, we employed a technique based on bootstrapping using the *SPSS* macro MEDIATE (Hayes & Preacher, 2013). Context argumentation was indicator-coded (0 = impairment, 1 = reinforcement). Age, gender and BMI were controlled in all regression models. For indirect effects, 95% bias-corrected confidence intervals were estimated based on 10,000 bootstrap samples. In contrast to an impairment strategy, a reinforcing argumentation increased trustworthiness and expertise perceptions of the video and the page (Fig. 3). However, the direct effect of context type on credibility of the author is only marginally significant. In turn, trustworthiness of the page, expertise perceptions regarding the page and the author as well as credibility of the author resulted in higher self-relevance ratings. Only perceived trustworthiness of the video had no direct effect on self-relevance ratings. After including the mediators in the model, the significant direct effect of context argumentation on self-relevance dropped to a non-significant level, indicating that source credibility perceptions fully mediated the influence of context argumentation on self-relevance. Indirect effects showed that expertise of the video ($b = .03$, $SE = .01$, CI = .0077–.0598) and the page ($b = .02$, $SE = .01$, CI = .0012–.0445), trustworthiness of the page ($b = .04$, $SE = .02$, CI = .0142–.0843) as well as credibility of the author ($b = .02$, $SE = .01$, CI = .0011–.0511) mediated the effect of context argumentation on self-relevance, while trustworthiness of the video did not influence the effect ($b = .01$, $SE = .01$, CI = −.0082–.0515).

3.3. Mediation effect of type of medium on self-relevance perceptions of the message through source credibility

Indicator coding was used again in order to test for mediation effects of type of medium (RQ1) on self-relevance. Two independent variables were computed, using Facebook as a reference category for blogs and for online news. In contrast to Facebook, blogs produced higher perceptions of credibility of the author and the trustworthiness of the page; in turn, both source credibility ratings increased self-relevance (see Fig. 4).
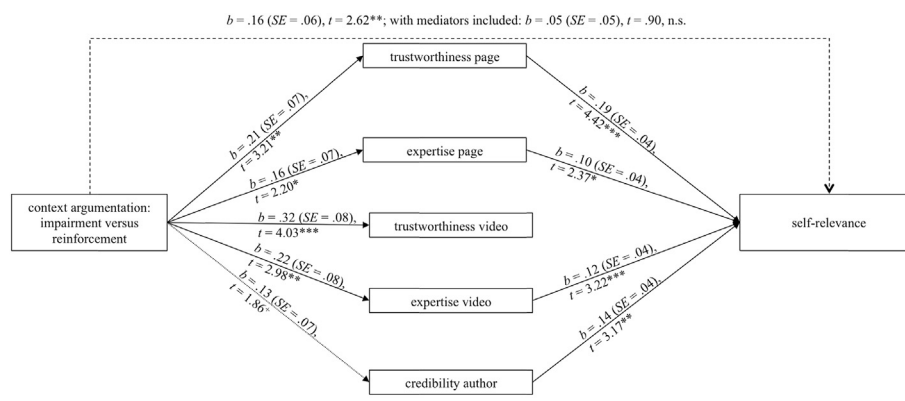
Analysis of indirect effects showed that the effect of blogs as opposed to Facebook on self-relevance was mediated through credibility of the author ($b = .02$, $SE = .01$, CI = .0011–.0554) and trustworthiness of the page ($b = .05$, $SE = .02$, CI = .0228–.0999). With regard to online news as opposed to Facebook, only trustworthiness of the page emerged as a significant mediator ($b = .04$, $SE = .02$, CI = .0145–.0920). This supports our prediction that online news benefits from higher credibility ratings as opposed to Facebook. Again, with regard to blogs, credibility functioned in a relatively similar way compared to online news.

A classical differentiation between traditional media types and social media types does not capture the specific perception of blogs in terms of credibility and relevance ratings.

4. Discussion

4.1. Summary of research

In this study, we aimed to explore the influence of source credibility for campaigns targeting childhood obesity on children and adolescents in detail, and we were interested in the effects that can be observed when these campaigns are embedded in various online media with different expectations towards the communicators and producers of such media (Facebook, blogs, online news). Furthermore, as we referred to a real campaign (Strong4Life) which achieved an ambivalent echo in mass as well as social media, we assumed that the contextual information of these medial environments significantly affects recipients' evaluation of the campaign itself. Thus, we presented the original campaign against childhood obesity in each media condition in an impairing or in a reinforcing condition.

$b = .16$ ($SE = .06$), $t = 2.62^{**}$; with mediators included: $b = .05$ ($SE = .05$), $t = .90$, n.s.

Note. $^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$. n.s. = non significant.
For clarity of visualization only significant and marginally significant paths are presented. Covariates are only indicated for the final model.
Model summary for regression of context argumentation on self-relevance: $R^2 = .06$, $F(4, 720) = 11.75$, $p < .001$.
Model summary for regression of context argumentation on expertise video: $R^2 = .01$, $F(4, 720) = 2.59$, $p < .05$.
Model summary for regression of context argumentation on trustworthiness video: $R^2 = .02$, $F(4, 720) = 5.39$, $p < .001$.
Model summary for regression of context argumentation on credibility author: $R^2 = .00$, $F(4, 720) = 1.82$, $p = .12$.
Model summary for regression of context argumentation on expertise page:, $R^2 = .01$ $F(4, 720) = 2.01$, $p = .09$.
Model summary for regression of context argumentation on trustworthiness page: $R^2 = .01$, $F(4, 720) = 3.61$, $p < .01$.
Model summary for regression of context argumentation on self-relevance with mediators included: $R^2 = .36$, $F(9, 715) = 46.70$, $p < .001$, Covariates in this regression: age: B = −.01 ($SE = .03$), $t = -.39$, $p = .69$; gender (male=1, female=2) B = .34 ($SE = .05$), $t = 6.50$, $p < .001$; BMI: B = .01 ($SE=.01$), $t = 1.67$, $p = .10$.

Fig. 3. Regression analysis of context argumentation on self-relevance through source credibility perceptions.

$b = .19 (SE = .07), t = 2.53*$; with mediators included: $b = .10 (SE = .06), t = 1.64$, n.s.

$b = .30 (SE = .08), t = 3.81***$

$b = .24 (SE = .08), t = 2.90**$

$b = .14 (SE = .08), t = 1.80$

$b = .18 (SE = .04), t = 4.08***$

$b = .11 (SE = .04), t = 2.57**$

$b = .12 (SE = .04), t = 3.21**$

$b = .14 (SE = .04), t = 3.06**$

Facebook versus Blogs

Facebook versus Online news

trustworthiness page

expertise page

trustworthiness video

expertise video

credibility author

self-relevance

$b = .16 (SE = .08), t = 2.02*$; with mediators included: $b = .09 (SE = .07), t = 1.42$, n.s.

Note. $^+p < .10$. $*p < .05$. $**p < .01$. $***p < .001$. n.s. = non significant.
For clarity of visualization only significant and marginally significant paths are presented. Covariates are only indicated for the final model.
Model summary for regression of type of medium on self-relevance: $R^2 = .06$, $F(5, 719) = 9.45$, $p < .001$.
Model summary for regression of type of medium on expertise video: $R^2 = -.00$, $F(5, 719) = .47$, $p = .80$.
Model summary for regression of context argumentation on trustworthiness video: $R^2 = .00$, $F(5, 719) = 1.23$, $p = .29$.
Model summary for regression of type of medium on credibility author: $R^2 = .00$, $F(5, 719) = 1.50$, $p = .19$.
Model summary for regression of type of medium on expertise page: $R^2 = -.00$, $F(5, 719) = .97$, $p = .44$.
Model summary for regression of type of medium on trustworthiness page: $R^2 = .02$, $F(5, 719) = 4.01$, $p < .01$.
Model summary for regression of type of medium on self-relevance with mediators included: $R^2 = .36$, $F(10, 714) = 42.34$, $p < .001$, Covariates in this regression:
age: $b = -.01 (SE = .03)$, $t = -.50$, $p = .62$; gender (male=1, female=2) $b = .33 (SE = .05)$, $t = 6.48$, $p < .001$; BMI: $b = .01 (SE=.01)$, $t = 1.71$, $p = .09$.
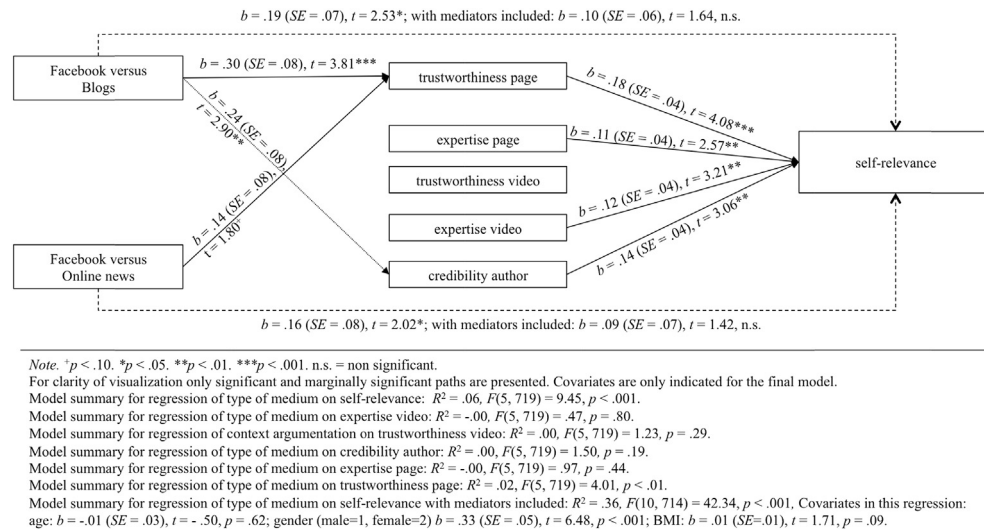
Fig. 4. Regression analysis of media type on self-relevance through source credibility perceptions.

Our findings demonstrate good reason to advise caution when it comes to a provocative or shocking message design in health communication. As context information, such as questioning the campaign's objectives or challenging the risks of obesity, showed cross-current effects depending on the students' bodyweight, we especially question the effectiveness of provocative messages in regard to the genuine target audience: our findings demonstrate that impairing contextual information not only weakens the perception of relevance of such campaigns, but in fact blocks concerned children's willingness to elaborate on these messages.

4.2. Theoretical implications

By stimulating the debate on provocative campaigns and the issue of obesity in online media and the question whether it is positive or negative, the range of health-related messages is considerably increased. In addition, media coverage of such campaigns also increases attention, which in turn allegedly leads to a higher probability of reaching the intended target group. Although our findings support the assumption that a traditional media context results in higher perceptions of self-relevance than Facebook, the consequences regarding self-perception should not be belittled. The influence of peer group-driven social media as an environment for campaigns' re-contextualization needs to be in the focus of further research all the more, as the effects of source dimensions on perceived credibility are multi-faceted and simplification disguises their impact on well-intentioned health messages.

Nonetheless, our findings show the two-sided effect of an online media-embedded anti-childhood-obesity campaign as message characteristics influence self-perceptions of weight significantly. Thereby, the implications of impairing context information's effects on self-perception of weight are just roughly estimated, and especially the contradiction of a cognitively vulnerable audience that evidently gains self-affirmation from provocative health appeals, displays a critical interaction. Social media play a role that is hardly surprising, as impairing contexts in Facebook considerably increase positive affective self-perceptions of weight. However, this remarkable influence of a media context that challenges a health messages' statements holds equally true for online news, but not for blogs. On the contrary, whereas a reinforcing message context on Facebook does not have an effect on recipients' affective perception of their own weight, a reinforcing context in online news slightly decreases affective self-perceptions of weight. Thus,

we assume that in contrast to message impairment, message reinforcement appears to be more sensitive to source credibility. On a closer look, these contextual effects mainly relate to specific message characteristics: as the Strong4Life campaign used a provocative approach in order to raise awareness for the childhood obesity topic, the impairing condition in our experimental design brought forward the argument that such campaigns do those affected a disservice by stigmatizing obese children. A refusal of provocative claims (impairment) seems to negatively influence the perception of the entire message. Furthermore, the more positive affective self-perception in an impairing message context is linearly related to the participants' BMI, showing a higher positive affective self-perception with higher BMI-values when participants were assigned to the impairing condition. We assume that the rejection of stigmatization in an impairing context especially serves as self-protection for the concerned children.

4.3. Limitations and future research

On this note, our findings show limitations which mainly address the following aspect: Due to ethical considerations and obligations of the Ministry of Culture, Youth, and Sport, dependent measures that prompt students' self-incrimination (e.g., "I tease other students", "I vilified other children") were not used in our research design. It thus remains doubtful, but of particular importance, whether students' estimations of relevance in respect to a provocative campaign are coterminous with higher or lower stigmatization of obesity-concerned children or adolescents.

With regard to bodyweight-related perceptions in experimental research, our paper lines up with 'questionable' constructs and measures that challenge criterion validity. Weight-related issues are most frequently defined as a relation between bodyweight (usually measured as BMI) and socio-demographic factors (Bae, Wickrama, & O'Neal, 2014; Burdette & Needham, 2012; Young & Nestle, 2002) or in terms of the bias between 'true' bodyweight and physiological self-perception (Duncan, Al-Nakeeb, & Nevill, 2013), self-confidence/self-esteem (Nabi & Keblusek, 2014; Pearl, White, & Grilo, 2014) or gender-related factors (Jauregui-Lobera, Ezquerra-Cabrera, Carbonero-Carreno, & Ruiz-Prieto, 2013).

While in principle weight-related factors have a high priority in terms of psychological well-being, weight-related effects vary considerably. Looking at the impact of affective body image after stimulus presentation in our study, both the valence of the stimulus

material and the interaction of valence and media type had a significant impact. The influence of age, the self-perception of bodyweight and the perception of the importance of one's own weight, however, no longer had a significant effect. As our findings showed inconsistent results for the measures we used, and expected effects were mainly derived from affective measures, the interpretation of weight as a moderating force in the processing of obesity-related messages should be made with reservations.

5. Conclusion

Overall, our findings suggest a careful reconsideration of the effectiveness of provocative messages in health communication as well as defensive reactions, as we were able to show a boomerang effect of these messages when the contextual information in online media opposes the message content. We were able to demonstrate a detrimental effect of the use of provocative messages when these campaigns are impaired by contextual information that interacts with the BMI of the participants. Especially concerned children and adolescents used the impairing contextual information to shield

themselves from anti-obesity arguments. Finally, such contextual opposition negatively influenced the participants' message judgment and, coincidentally, increased affective self-perception.

Appendix

Stimulus material

All websites consisted of a teaser of the manipulated article (blog, online news) or profile information pages (Facebook) with a timeline and different postings. Articles and postings were of comparable length (350 words), contained the same key information, and the same author information. Furthermore, a motif of the campaign with a translated slogan as well as a synchronized version of the campaign's video spot was embedded. In order to eliminate gender effects, participants were randomly assigned to two versions of the six stimulus versions where they either saw the poster with a girl and the spot with a boy or vice versa. The sites were programmed in html and fully functional, allowing for navigation. Advertisements in all stimulus conditions were displayed as a "natural" design element. All ads were equally distributed.

A. Example for facebook condition

B. Example for blog condition
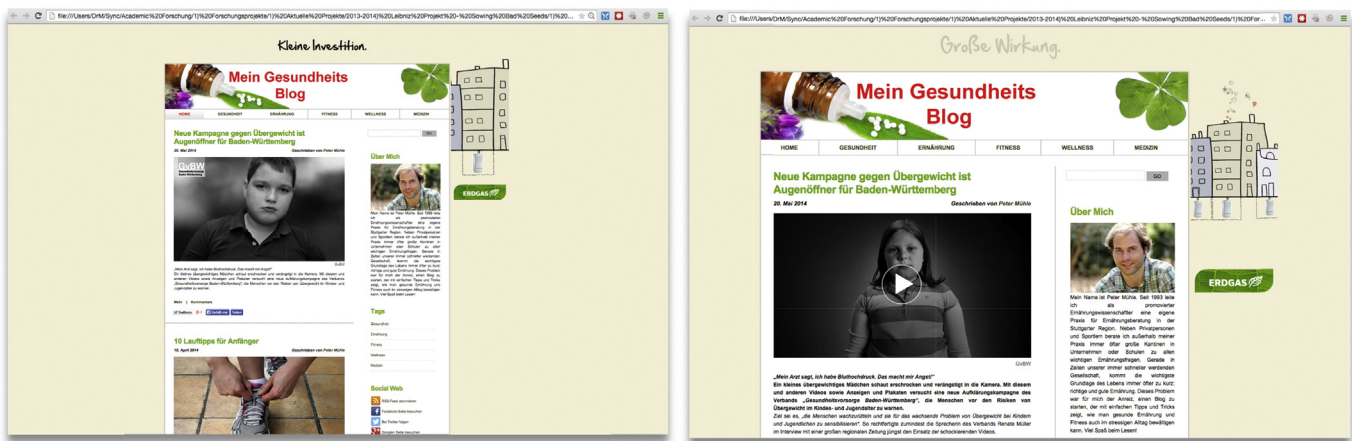
C. Example for online news condition
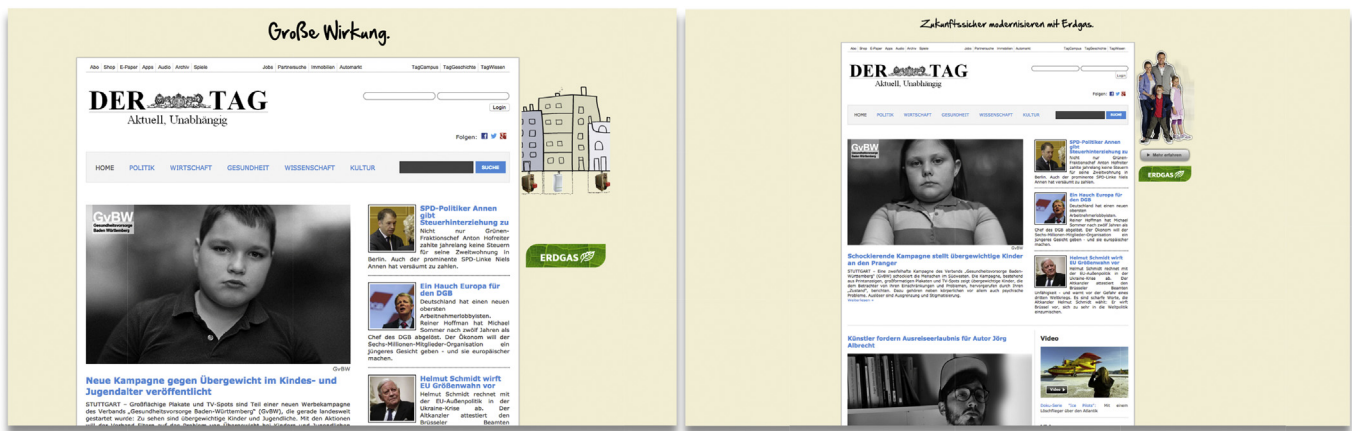
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