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Video killed the news article? Comparing multimodal framing effects in news videos and articles

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Video Killed the News Article? Comparing Multimodal Framing Effects in News Videos and Articles

Thomas E. Powell⬤, Hajo G. Boomgaarden, Knut De Swert, and Claes H. de Vreese

The recent proliferation of online videos captured at the scene of news events begs the question: Do news videos have a meaningful impact on citizens' political opinions and behaviors that is different than that of news articles? This was examined in an experiment using carefully matched videos and articles about the European refugee crisis. Findings show that articles generated stronger intentions to help refugees than videos, and this was mediated by the depth with which the news story was processed. Despite their increasing prominence and intuitively impactful qualities, news videos do not deliver more powerful effects than news articles.

An increasingly visual media landscape provides an ever more vivid insight into news stories. The advent of TV provided a visual connection with news beyond that of newspaper photographs. The recent explosion of online videos captured via mobile technology mean that journalists more regularly transport audiences closer to the visceral reality of news stories than ever before (Bock, 2015; Kalogeropoulos, Cherubini, & Newman, 2016). In a typical news article, an impactful image alongside text is known to evoke emotions and frame citizens' perceptions of politics (Grabe & Bucy, 2009; Graber, 1996). However, it is not known whether the comparatively richer and more psychologically activating qualities of news videos exert a more powerful influence over political opinions and behaviors. To shed new light on the effects of this growing news format, this study examines the contribution of visual and verbal modalities to framing effects generated by online news videos and articles.

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The refugee crisis in the Middle East and Europe provides a prime example of how journalists frame political issues. On September 2, 2015, publication of the photo of the drowned Syrian boy Alan Kurdi magnified the plight of refugees and emphasized their role as innocent victims in the crisis. In a matter of hours, the image went viral and prompted a surge in charity donations and petition-signing, and widespread, albeit temporary, policy change across Europe (Vis & Goriunova, 2015). This was countered by depictions of refugees as intruders, where visuals of hostile crowds framed them as a threat to Europe's safety and cultural integrity. Framing refugees as *victims* (e.g., Van Gorp, 2005) and *intruders* (e.g., Bleiker, Campbell, Hutchison, & Nicholson, 2013), both visually and verbally, exemplifies how news media can make certain aspects of an issue more salient (Entman, 1993), which, depending on the reader, can change political opinions and behaviors (Scheufele & Tewksbury, 2007).

The media formats via which these frames were presented during the crisis have been diverse. Written articles remain the norm, both online and offline, and are typically accompanied by one or more images. Videos embedded on news websites containing moving images and a verbal narration are an increasingly popular alternative (Bock, 2015). Although these media formats often contain substantively the same information, their properties promote a very different reception experience.

The dynamic visual flow of videos yields a richer depiction of reality than static images (e.g., Green et al., 2008). A video's auditory narration externalizes the implied message of the visuals (Messaris & Abraham, 2001), albeit in a less structured way than the self-paced reading of a news article's text (Tukachinsky, Mastro, & King, 2011). Despite these straightforward routines, propositions from framing effects theory on this topic remain underexamined. For instance, whether these medium-specific qualities influence the role of visual and verbal modalities in frame integration (Geise & Baden, 2014). Meanwhile, existing research paint a mixed picture about the emotional and cognitive mechanisms underpinning these effects (e.g., Lang, 1995; Pincus, Wojcieszak, & Boomgaarden, 2016).

To address these gaps, this study used carefully controlled experimental manipulations of a news story about the European refugee crisis presented in article and video formats. In doing so we addressed three questions: (1) Do news videos generate stronger framing effects than news articles? (2) Does the presentation of a story via video or article format influence the role of the visual and verbal modalities in framing effects? And, (3) What mediating role do emotions and depth of information processing play in producing these effects?

Multimodal Framing Effects

The multimodal combination of words and visuals is acknowledged but under-examined in news framing literature (Dan, 2018; Entman, 1993). An overwhelming majority of research has focused on effects of frames delivered through news texts (e.g., Lecheler, Bos & Vliegenthart, 2015). A growing body of literature on visual

framing (e.g., Geise & Baden, 2014; Grabe & Bucy, 2009) has shown the effects of news visuals on political perceptions (e.g., Powell, Boomgaarden, De Swert, & de Vreese, 2015). However, such unimodal insights fail to capture the stylistic-semiotic combination of image and text that determines how news frames resonate with viewers' internal frames of references, and, in turn, affect citizens opinions and behaviors (de Vreese, 2005; Kress & Van Leeuwen, 1996).

In their theoretical model of multimodal framing effects, Geise and Baden (2014) articulated several propositions about how multimodal frames are decoded by audiences: Visuals are superior to text in their salience attribution, but texts have a more conventional structure. Compared to visuals, text promotes a more direct matching of signifier and signified. Text frames specify the relations between decoded elements whereas visuals merely suggest associations. Lastly, compared to text, the richness of visuals provides a surplus of information for integration and more variability in the formulation of a central organizing idea. Here we focus on this final level of the framing process—the integration of multimodal cues and subsequent effects (Rodriguez & Dimitrova, 2011). Moreover, we go beyond Geise and Baden's model, which focused on static images and text, by testing this proposition in news videos. Furthermore, these propositions connect well with the processes underpinning framing effects: accessibility and applicability (Nelson, Oxley, & Clawson, 1997). Visuals should be particularly effective at making associations more accessible in mind when considering a political issue, whereas words might help individuals determine what is applicable to their pre-existing ideas (e.g., Scheufele & Tewksbury, 2007). Thus, a secondary goal of this study is shed new light on these understudied mechanisms.

To empirically examine multimodal framing effects, we conceptualize news media (in this case news articles and videos) as comprising separate visual and verbal inputs (static images and text, or moving visuals and audio), which provide information to be integrated for the reader to decode the central meaning, or frame, of a news item (Geise & Baden, 2014). By manipulating the semantic correspondence (also known as congruence, or redundancy, see Lang, 1995 for a summary) of both the visual and verbal inputs, we study how each modality contributes to effects. If a story's visual and verbal inputs both portray (or frame) refugees as victims (or intruders) then the story can be said to have high visual-verbal congruence. If the visual and verbal elements do not match, they are said to be incongruent. Such visual-verbal mismatches sometimes occur in news content—busy editors are often forced to hurriedly select a news visual from a limited set (Fahmy, Bock, & Wanta, 2014). Importantly, framing of refugees as victims or intruders in words and visuals should influence respondents' policy opinions and behavioral intentions to support or oppose refugees. In this study, we manipulate visual-verbal congruence in news about the refugee topic, to compare multimodal framing effects across different media formats—news videos and articles.

Building on research manipulating only one of the visual or verbal modality (e.g., Arpan et al., 2006; Pfau, Holbert, Zubric, Pasha, & Lin, 2000; Zillmann, Gibson, & Sargent, 1999), a handful of framing studies have manipulated visual-verbal congruence

in articles to examine effects on political opinions and behaviors (Boomgaarden, Boukes, & Iorgoveanu, 2016; Powell et al., 2015; Seo & Dillard, 2016). Related evidence points toward modality-specific processing pathways, with visuals being processed more emotionally or automatically, and text more controlled or cognitively (Chaiken, 1980; Powell, Boomgaarden, De Swert, & de Vreese, 2018; Sparks, Areni, & Cox, 1998). However, no studies have examined whether the processing and effects of multimodal news frames might differ in different media, such as articles and videos. That is the goal of this study.

Effects of Dynamic and Static Media

In line with Geise and Baden's (2014) theoretical model, framing effects of news videos and articles can be informed by considering their distinguishing characteristics. Compared to the static image(s) and text in news articles, videos are richer, should be superior in their salience-enhancing abilities (de Vreese, 2005; Powell et al., 2015), and suited to transporting viewers into a story (Green et al., 2008). In contrast, compared to the unbroken narrative flow of a video's audio stream, the structured syntax of an article's text should lead to more focused decoding (Geise & Baden, 2014). This, together with a static image, demands more self-paced attention-allocation, imagination, and processing effort than videos (Messaris & Abraham, 2001).

Empirical studies into the effects of these medium-specific qualities have been limited to the domains of media memory and persuasion, on which we draw to inform our study of framing effects. Psychology (e.g., Broadbent, 1956; Mayer, 2009) and communication scholars (e.g., Graber, 1996; Lang, 1995) point to cumulative effects of visual and verbal streams on learning when presented in parallel as in a typical news video. Moreover, because the reception of visuals occurs quickly and holistically (Lang, Potter, & Bolls, 1999), the addition of visual to verbal input should not burden information processing but benefit learning (see also Severin, 1967). As such, the relatively richer qualities of news videos compared to articles, coupled with viewers' ability to process their synchronous visual-verbal streams, might give an advantage to videos during decoding and subsequent effects of victim and intruder frames.

Theories that emphasize information processing requirements over information richness provide an alternative perspective. The Limited Capacity Information Processing Approach (Lang, 1995, 2000) states that visual and verbal streams can facilitate learning as long as the receiver's processing capacity is not overloaded. Lang (1995) synthesized a previously mixed body of research to argue that the structural characteristics inherent in multimodal TV and video content (e.g., camera cuts and zoom) introduces complexity that can overload viewers' limited capacity (Lang, Bolls, Potter, & Kawahara, 1999). In contrast, news articles with a text and image(s) engender serial processing and possess fewer structural constraints—thus allowing the reader to operate within their capacity (Unnava, Burnkrant, & Erevelles,

1994). Indeed, the addition of video to multimedia online news has been shown to hinder recall of story content (Sundar, 2000), and likewise could disrupt effects of news frames on political opinions and behaviors.

To test these opposing perspectives, we use only congruent visual-verbal stimuli to compare the relative power of videos and articles in framing effects. Despite the intuitively impactful qualities of news videos, existing research on media learning and persuasion remain equivocal. Therefore, we pose the following research question:

RQ$_1$: When visual and verbal streams are congruent, are framing effects stronger in news videos or articles?

Visual and Verbal Effects in Different Media

Further inspection of the distinct characteristics of news videos and articles point to potential differences in the relative power of the visual and verbal modality to influence framing effects. We propose that visual input should exert stronger effects in videos than articles, whereas verbal input should have a greater effect in articles compared to videos.

Videos are primarily visual in nature. A 10-second video clip typically contains hundreds of still images that are fused by the visual system into continuous motion. The human brain is finely tuned for perceiving moving stimuli, particularly of other people, in order to provide clues for social interactions and decision-making (van Driel, Grabe, Bas & Kleemans, 2016). Moreover, the vividness of a video's visual stream mirrors direct experience (Grabe & Bucy, 2009), something that has been shown to improve media attention and memory, evoke emotional reactions, and be persuasive (Blondé & Girandola, 2016). Indeed, when learning from visual and verbal streams in TV news has been compared, a relatively consistent superiority is observed for the visual stream to the detriment of the verbal modality (Lang, 1995; Nelson, Reed, & Walling, 1976). This might also be the case for the reception and effects of frames in news videos.

In contrast, news articles may bias verbal input. Although static images are attention-grabbing (Garcia & Stark, 1991) they also possess a degree of connotative ambiguity (Geise & Baden, 2014). As a result, the meaning of a news article is primarily deciphered through text, which in turn can influence political opinions (Powell et al., 2015). Moreover, articles provide the opportunity for detailed re-reading and resolution of opacities in a manner that is not possible for the audio stream of news videos. Indeed, compared with the central role of vivid visuals in videos, for articles an image may merely serve as a "conceptual peg" on which the substantive meaning of a news text can be "hung" to guide interpretation (Paivio, 1991).

We use a congruence-incongruence manipulation to unpack the relative contribution of visual and verbal inputs to framing effects in videos and articles. Based on the relative bias of videos and articles towards visual and verbal modalities respectively, we propose the following hypotheses:

H_{1a}: Visual framing effects are stronger in news videos than articles (a visual frame-by-medium interaction).

H_{1b}: Verbal framing effects are stronger in news articles than videos (a verbal frame-by-medium interaction).

Processing Routes to Medium-Specific Effects

A differential impact of videos and articles on visual and verbal framing effects begs the question of how these effects might occur. Along with dual-coding theory (Paivio, 1991), neuroscience research has argued for a fast and subconscious transmission of visual stimuli directly to the brain's emotional centers, compared to the necessarily slower and conscious processing of verbal stimuli via neocortex (Barry, 1997; Lang, Potter, et al. 1999). This processing distinction also conforms to a more emotional versus cognitive processing of visual and verbal frames (Coleman & Wu, 2015; Geise & Baden, 2014; Powell et al., 2018). However, the processing of multimodal news frames remains untested, let alone in different media formats.

In this study, we use the context of the ongoing European refugee crisis to investigate whether the role of distinct visual and verbal information processing pathways is accentuated in different news media. In line with previous studies, we propose that visual frames are well suited to evoke emotions, which in turn influence political opinions and behaviors. The visual portrayal of refugees as victims should elicit sympathy or guilt which may, in turn trigger, supportive attitudes and helping behavior (Iyer, Webster, Hornsey, & Vanman, 2014). In contrast, when portrayed as intruders, one may feel fear or disgust towards the presence of unwanted strangers, leading to avoidance (Lazarus, 1991). Both victim and intruder visual frames might evoke anger—either from the perceived unnecessary suffering of refugees or the unjust intrusions of foreigners—which should change opinions or inspire actions to resolve the situation (Kühne, 2012). Since videos are a highly visual medium, these "emotivational" goals (Frijda, 1988) should be especially strong in video format compared to new articles.

In contrast, we operationalize more systematic and cognitive processing of verbal frames as increased information processing depth (Craik & Lockhart, 1972; Griffin, Neuwirth, Giese, & Dunwoody, 2002; Lang, 1995; Wolski & Nabi, 2000). Those who process information deeply also score highly on verbal intelligence scales (Cacioppo, Petty, Feinstein, & Jarvis, 1996) and gain more knowledge from news-paper use—a primarily textual medium (Liu & Eveland, 2005). In framing research, the effects of text have been shown to be moderated by issue-specific knowledge (Nelson et al., 1997; Schuck & de Vreese, 2006), indicating a reliance on deeper information processing. As such, we argue that framing effects produced by verbal input, especially in the highly textual form of a news article, should lead to deeper information processing compared to the audio stream of a news video.

We model these medium-specific processing pathways through moderated mediation models, with visual and verbal frame conditions tested separately as independent variables. We include emotions (sympathy, guilt, anger, fear, disgust) and depth of processing separately as mediators. Crucially, we assess whether different mediums (videos and articles) moderate these mediated effects. As such, we propose our final set of hypotheses:

H_{2a}: Effects of visual frames are mediated by emotions more strongly in videos than articles (moderated mediation of visual effects).

H_{2b}: Effects of verbal frames are mediated by information processing depth more strongly in articles than videos (moderated mediation of verbal effects).

Method

Design

We used an online experiment in the context of the ongoing European refugee crisis to test our hypotheses. Participants were randomly assigned to twelve conditions in a two (medium: article, video) by two (visual frame: victim, intruder) by three (verbal frame: victim, control, intruder) between-subjects factorial design. Thus there were six different versions of the articles ((1) victim visual–victim verbal; (2) victim visual–control verbal; (3) victim visual–intruder verbal; (4) intruder visual–victim verbal; (5) intruder visual–control verbal; (6) intruder visual–intruder verbal), and this was repeated for the videos.[1]

Participants

A group of 923 Dutch adults aged 18 to 75 were recruited via an online data collection panel, Survey Sampling International, in early August 2016. The sample was representative of the Dutch population for gender (466 females, 51%) and fairly representative for age (M = 47.32, SD = 16.54). A total of 93% of participants were born in the Netherlands and 40% had at least one parent who was not born in the Netherlands. There was a range of educational backgrounds and political ideologies. Participants were reasonably knowledgeable about the refugee crisis (1 = *Not at all*, 7 = *Extremely, M* = 4.50, *SD* = 1.27).

Stimuli

Stimuli were selected from media coverage of the European refugee crisis. A rigorous pre-testing procedure, helped us to: (1) achieve the victim and intruder

frame manipulations in the visual and verbal modalities[2]; (2) maximize visual-verbal congruence/incongruence; (3) keep the content of the articles and videos the same as far as possible; and, importantly, (4) control for factors known to influence media effects—including perceived arousal, salience, complexity, ambiguity, and credibility (Lang, 1995; Powell et al., 2015; Severin, 1967). Details of the pre-tests can be requested from the authors.

Briefly, the following steps were taken in developing the stimuli: Several article texts were downloaded from the *BBC News* and *UN High Commission for Refugee* Web sites and modified to reflect the victim, intruder, and control frames. For the control texts, we removed or replaced words and phrases included as part of the frame manipulations. For instance, an excerpt from the article read: "Governments will use their armed forces to protect the victims" (1, victim condition); ... protect their borders" (2, intruder condition); ...for extra support" (3, control/balanced condition). The final framed texts were used as the script for the audio stream, which were read by a professional broadcast journalist.

The videos were made using clips from online news sites (e.g., *The Guardian, SkyNews, RuptlyTV* and *Human Rights Watch*). Victim videos included scenes of refugees being pulled from the sea, receiving medical care and sleeping on streets. Intruder visuals included crowds of refugees near security fences and acting violently towards border guards. Still images were captured from these videos to be used in the articles. The final framed victim image (*Human Rights Watch*) depicted a young boy recently pulled from a boat, and the intruder image (*Ruptly TV*) showed violent migrants crowding around a fence.

These elements were combined so that the final articles and videos contained the same basic structure: a first section containing basic factual information about development of the crisis, a central part containing the differently framed content, and an end section containing factual information concluding by stating the crisis is not yet resolved. This is consistent with news framing as the same factual information presented with a different emphasis (e.g., de Vreese, 2005). In the articles, each of the three sections was around 35 words in length (total article lengths in words: victim text 112; intruder text 117; control text 108). For the videos, each section lasted approximately 15 seconds (with the full videos just under 50 seconds long). A still image from all three sections was inserted into the articles so that all parts of the video were visually represented in the articles. Examples of the stimulus articles and videos can be requested from the authors.

Procedure

After entering the survey, participants were asked about their prior attitudes on immigration, knowledge of the refugee crisis, general political interest, their preferred political party, and their political orientation.

Participants were then randomly assigned to one of the stimulus videos or articles. In the video conditions, participants saw the stimulus video on a blank screen and

clicked on it to start watching. Participants were not allowed to progress until at least 55 seconds had elapsed—enough time to view the video in its entirety. A test question ensured that participants had the sound on before viewing the video. In the article conditions, participants were not allowed to progress before 25 seconds had passed, and the survey automatically progressed after 90 seconds—a time window that accommodates participants with different reading rates but matches well with the duration of the video. Immediately before the stimulus, participants were informed that they would be viewing a news video or article about the refugee crisis and clearly told about the time they were given to do so.

Next, the dependent variables were displayed. Questions measuring support for refugees coming to Europe, behavioral intentions to act in support of refugees, emotions felt when viewing the stimulus, and information processing depth were shown on successive pages. Before being debriefed, participants provided basic personal information, such as age, gender, education level, birth country, and parents' birth country.

Measures

Support for the policy of allowing Syrian refugees into Europe was measured using two items: "There should be more Syrian refugees allowed into Europe," and "Syrian refugees should be prevented from seeking asylum in Europe (reversed)" (1 = s*trongly oppose, 7 = strongly support, M = 3.82, SD = 1.65, r = .69*). Behavioral intentions to act in support for Syrian refugees were measured using three items (intention to: share the news item on social media, donate to charity, sign a petition; 1 = *very unlikely*, 7 = *very likely*; M = 2.81, SD = 1.38, α = .75).

Questions measuring the mediator variables followed. Participants indicated the extent to which they felt a number of relevant emotions of interest whilst viewing the stimulus (1 = *not at all*, 7 = *extremely*), in the same manner as Iyer et al. (2014) and Powell et al. (2015). Two items assessed fear (afraid, anxious; M = 3.39, SD = 1.57, r = .58), anger (angry, furious; M = 3.14, SD = 1.64, r = .73), sympathy (sympathetic, compassionate; M = 4.07, SD = 1.64, r = .76), disgust (disgusted, repulsed; M = 2.74, SD = 1.53, r = .64), and guilt (guilty, ashamed; M = 2.72, SD = 1.48, r = .64). Processing depth was assessed using four items adapted from Wolski and Nabi's (2000) Depth of Processing Scale. These included: "I was motivated to read this article"; "I paid close attention to each point that was made"; "I thought deeply about the contents"; "My mind wandered as I read the article" (reversed) (1 = *strongly disagree*, 7 = *strongly agree; M = 4.22, SD = 1.15, α = .74*).

Analysis Strategy

All analyses were conducted on the two main dependent variables—support for refugees and behavioral intentions. RQ_1 was tested using only the congruent visual-verbal frame conditions in a two-way ANOVA—with stimulus frame and

medium as between-subjects' factors. H_{1a} and H_{1b} were tested using all congruent and incongruent conditions, entered into a 3-way ANOVA, with visual frame, verbal frame, and medium as between-subjects' factors.

H_{2a} and H_{2b}—effects of visual frame and verbal frame mediated by emotions and processing depth, moderated by medium—were tested with ordinary least squares path analysis using Hayes PROCESS-macro in SPSS (Hayes, 2017; Model 7). Four moderated mediation models were estimated. Two models contained the victim and intruder levels of the visual frame as the independent variable—one of these with participants' sympathy, guilt, fear, disgust, and anger entered in parallel as mediators, and the other with depth of processing as the mediator.[3] The other two models included the victim, control, and intruder levels of the verbal frame as the independent variable (entered simultaneously)—again with one model for emotions as mediators and the other with processing depth. All four models included stimulus medium (article vs. video) as the moderator of the a-path and 95% bias-corrected confidence intervals based on 10,000 bootstrap samples were used for statistical inference of conditional indirect effects.

Results

The Relative Power of Videos versus Articles

Two-way ANOVA was used to test RQ_1—whether framing effects were stronger in videos than articles. We observed a significant main effect of medium on participants' behavioral intentions to help refugees, $F(1, 302) = 15.47$, $p = .003$, $\eta_p^2 = .03$. Participants who read an article ($M = 2.95$, $SD = 1.29$) reported significantly stronger behavioral intentions compared to those who watched a video ($M = 2.49$, $SD = 1.34$). No main effect of frame, nor frame-by-medium interaction, was observed. See Figure 1. There were no significant main effects or interactions observed for the support for refugees variable.

This result provides an answer to RQ_1: regardless of the frame of the news item, those who read an article had stronger intentions to help refugees than those who watched a video.

Visual and Verbal Effects in Different Media

A three-way ANOVA including all congruent and incongruent stimulus pairings was used to test H_{1a} and H_{1b}—on the strength of visual and verbal effects in videos and articles.

We again observed a main effect of medium on participants' behavioral intentions to act to help refugees, $F(1, 907) = 7.83$, $p = .042$, $\eta_p^2 = .01$. Participants reported higher behavioral intentions to help refugees after reading an article ($M = 2.90$, $SD = 1.34$) compared to watching a video ($M = 2.71$, $SD = 1.42$). The verbal frame-by-medium

Figure 1

Mean differences in behavioral intentions between the frame conditions across different media. Using the congruent visual-verbal frame conditions only. The main effect of medium on behavioral intentions is shown (P = .003). Means and standard errors are plotted. Note that the Y-axes on both charts do not reflect the full range of the scales
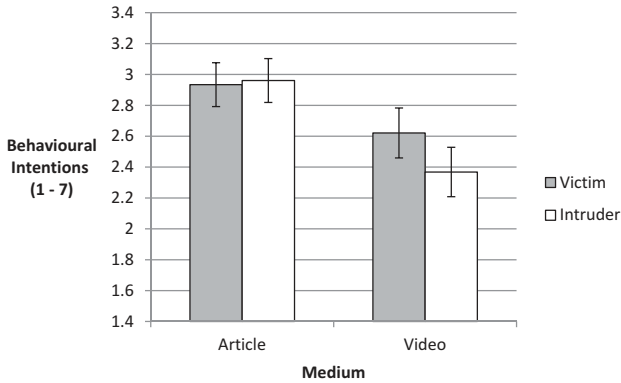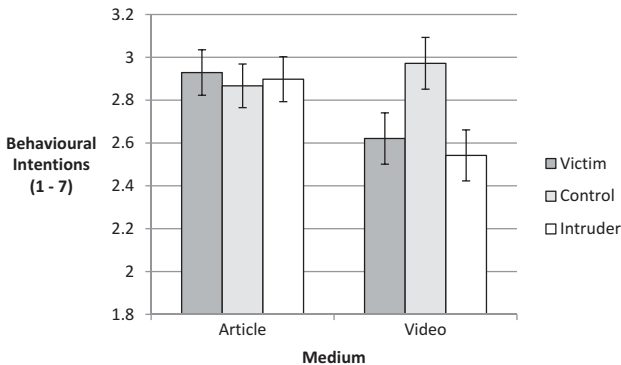

Figure 2

Mean differences between the verbal frame conditions on behavioral intentions by article and video mediums. The chart shows the main effect of medium (P = .042) and the Marginal text frame-by-medium interaction (P = .078). Means and standard errors are plotted. Note that the Y-axis does not reflect the full range of the scale

interaction was $F(2, 907) = 2.56$, $p = .078$, $\eta_p^2 = .01$. These results are shown in Figure 2, and are considered further in the Discussion. There were no significant main effects or interactions for the support for refugees variable.

These results do not support H_{1a} or H_{1b}: Visual framing effects were not stronger in video format than articles, and verbal framing effects were not significantly stronger in those who read an article than those who watched a video. Again, a significant main effect of medium suggests that, regardless of the frame presented, those who read an article showed stronger intentions to help refugees than those who watched a video.

Conditional Indirect Processing Pathways

Moderated mediation effects were examined to test hypotheses H_{2a} and H_{2b}—whether visual effects were mediated by emotions more strongly in video form, and whether verbal effects were mediated by processing depth more strongly in articles. Results showed non-significant results for the tested models. This was the case for both support for refugees and the behavioral intentions variables.

As a supplementary analysis, we assessed potential mediators of the consistent main effect of medium on behavioral intentions. To do so, we tested two mediation models with medium (article vs. video) as the IV and processing depth and emotions as possible mediators. A strong indirect effect was observed for depth of processing. Those who read an article processed the story more deeply than those who watched a video, and this increased participants' intention to act to help refugees (see Figure 3).

To summarize, we found no support for H_{2a} or H_{2b}, regarding conditional indirect effects of the different frame modalities via emotions and processing depth for those

Figure 3
Path analysis model showing the indirect effect of medium on behavioral intentions through processing depth. Unstandardized beta coefficients are shown, *$P < .05$, **$P < .01$, ***$P < .001$. 95% bias-corrected bootstrap confidence intervals based on 10,000 bootstrap samples are shown for significant indirect effects
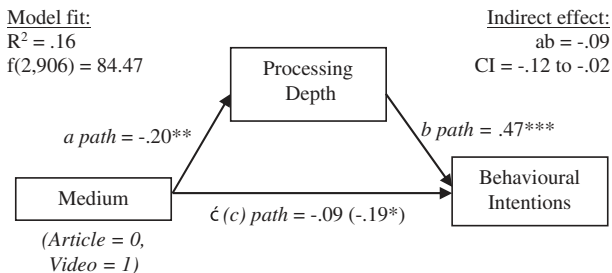
who watched a video versus article. However, the consistent main effect of medium on behavioral intentions was mediated by processing depth: those who read an article processed the story more deeply than those who watched a video and, in turn, showed increased intentions to help refugees.

Discussion

This study used news reports about the European refugee crisis to assess multimodal framing effects in different media formats. Results showed that, regardless of the frame conveyed, those who read a news article reported stronger intentions to help refugees by sharing a story, signing a petition, and donating money, compared to those who watched a video. In contrast to the dynamic flow of a news video, the self-paced and pro-active engagement involved in reading a news article (Sundar, 2000; Unnava et al., 1994) led to deeper processing of the story and stronger intentions to help refugees (e.g., Chaiken, 1980; Geise & Baden, 2014). In addition, findings showed that the processing and effects of the verbal and visual modalities in news frames do not dramatically differ between videos and articles (Tukachinsky et al., 2011).

The recent upsurge in the use of online news videos underlines the importance of our findings showing stronger intentions to help refugees for those who read an article (Bock, 2015). The lack of significant effects of the victim and intruder frames is, however, unusual and noteworthy. This may be due to the refugee issue, which is probably the most salient and politicized news topic of the past three years. Since individual characteristics such as issue knowledge, prior attitudes, and political ideology were successfully randomized this cannot be attributed to an experimental artefact. Instead, any mention of refugees appears to have triggered intentions to help, which proved particularly strong for articles. This fits with the expectations of limited-capacity models of media effects (e.g., Lang, 1995), which argue that although videos are information-rich and psychologically activating, their structural properties such as camera cuts may distract from viewer's processing capacity. With eight cuts in 50 seconds, our videos contained a "medium" number of cuts (Lang, Bolls, et al. 1999). Thus, despite being not excessively distracting, our videos were nevertheless processed less deeply and were less effective than the self-paced and serial processing of new articles (e.g., Unnava et al., 1994).

In addition, results showed that framing effects of the visual and verbal modalities were not accentuated in videos and article format, respectively. Apparently, the distinct communicative qualities of videos and articles are diluted in the integration of multimodal frames (Kress & Van Leeuwen, 1996). Worth noting, however, is a marginal verbal frame-by-medium interaction described in the Results section and shown in Figure 2. Surprisingly, the verbal frame conditions produced an effect in the video format, with no differences for the article format. More specifically, the presence of victim and intruder verbal frames reduced intentions to help refugees compared to the control verbal frame. One may speculate that participants

immediately rejected the framed verbal messages in video format because videos afford little opportunity for frame integration (Geise & Baden, 2014). Ultimately though this cannot be substantiated in the scope of this study. Given the highly visual and increasingly polarized political landscape, future research should further explore how different media formats influence citizens' perception of multimodal frames.

Separately, our moderated mediation models showed that vivid news videos did not evoke a strong emotional response and did not accentuate framing effects produced by the visual modality. This was unexpected since the moving images of videos are a rich index of real-world visual experiences (Messaris & Abraham, 2001). Instead, the conative quality of still images—that the events surrounding a captured image are left to the imagination of the viewer—could rival moving images in their ability to frame an issue (Zelizer, 2010).

This study has limitations. This study uses a single-message design which limits generalizability. This design choice was made to ensure that the framed stimuli were comparable in article and video form and were matched for several potential con-founds of framing effects—arousal, salience, complexity, ambiguity, and credibility. Replications with multiple messages and different issues are needed to strengthen our conclusions. Separately, we forced participants to view certain articles and videos. In reality, news audiences have the freedom to select content and media formats of their choosing. This may preclude users from selecting articles in the first place (but see Kalogeropoulos et al., 2016) and can influence information processing and effects in ways we cannot account for in this study. Future research should study the selection and effects of different media formats in both forced and selective exposure environments (e.g., Arceneaux & Johnson, 2013). Additionally, although the effects observed were significant, effect sizes were small and require replication to reinforce our conclusions.

This study makes several important theoretical contributions. To our knowledge, this is the first study to directly compare framing effects in articles and videos. As such, we extend the boundary of multimodal framing theory from static image-text media to dynamic audio-visuals. Our findings firmly align with conceptions of framing as an active process (Lecheler & de Vreese, 2012), in which viewers' internal frames are rendered applicable through pro-active engagement with content (especially in articles), rather than mere activation (e.g., via visual cues in videos; Scheufele & Tewksbury, 2007). Furthermore, we show the predictive capacity of Geise and Baden's (2014) theoretical propositions of multimodal framing across different media formats: focused integration of meaning provided by articles out-weighs the salience-enhancing qualities of videos. Future research should explore their other propositions across different media, while considering other types of frames and individual differences. This will also help shine much needed light on the underspecified concepts of accessibility and applicability in news framing (Scheufele & Tewksbury, 2007).

Finally, this study has several practical implications for online news publishers, producers, and journalists alike. News articles have a stronger influence over

behavioral intentions compared to the same content presented in video form. Therefore, political parties, social movements, campaigns, or charities that might invest extra resources in creating videos should think again—articles are more likely to influence citizens' political behavior. Furthermore, news articles are processed more deeply than news videos. Therefore, journalists wishing to adopt an interpreter or adversary role conception and develop the critical capacities of their audience should stick to article format, and not video (Beam, Weaver, & Brownlee, 2009). These observations should raise a flag of caution to news organizations that are investing heavily in the "rush to video" (Bock, 2015; Kalogeropoulos et al., 2016; p. 8). Although there are important motives for this move—audio-visuals draw attention to news stories (Brosius, 1993; Garcia & Stark, 1991)—this focus on video content is misguided if journalists wish to achieve the loftier democratic ideal of engaging citizens in the news. When taken together with research showing that online news audiences spend only 2.5% of average visit time with videos compared to 97.5% of time with the text of articles (Kalogeropoulos et al., 2016), this study reinforces the status of articles, and the inherent flexibility and depth of analysis they provide, as news publishers' medium of choice.

Acknowledgments

Notes

1   On average, each of the 6 article conditions contained 87 participants and each of the 6 video conditions contained 66 participants. The higher number of participants in the article conditions is due to these conditions being used in a separate study that is not related to the present experiment. To provide an indication of the power of the study we conducted a post-hoc power analysis using G*Power (Erdfelder, Faul, & Buchner, 1996). Taking the finding for the ANOVA testing RQ_1 ($N = 306$): there was a 93% chance of detecting a small to medium effect size (equivalent to the observed $\eta_p^2 = .03$ translated to those defined by Cohen, 1992, as $d = .2$) as significant at the 5% level (two-tailed). Separately, experimental groups did not differ on age, gender, education, religious background, place of birth, nor on prior attitudes toward refugees, knowledge of the refugee crisis, general political interest, preferred political party, and political ideology (all $p > .1$). Note also that we chose not to include a control condition for the visual frame condition. This is because it is not clear what would comprise a neutral and balanced visual to serve as an adequate equivalent to the text control condition. Due to this, and to achieve a more parsimonious experimental design, we opted not to include a control visual condition.
2   Success of the frame manipulations was also confirmed in the final experiment using two questions: "to what extent did the video/article portray refugees as 1) victims, 2) intruders?" An independent samples t-test showed a significant difference between the victim and intruder visual frame conditions (Mvictim = 2.87, SDvictim = 2.63, Mintruder = 2.02, SDintruder = 2.82, $p < .001$). For the verbal frame conditions, one-way ANOVA (using post-hoc comparisons) with one-tailed significance testing showed a significant difference

between the victim (M = 2.66, SD = 2.74) and intruder (M = 2.25, SD = 2.92) verbal frames (p = .036). There was no significant difference between the control (M = 2.44, SD = 2.60) and victim (p = .165) and the control and intruder (p = .199) verbal frames. However, as intended, the mean score for the control condition fell between that of the victim and intruder frames.

3   Although it would be possible to enter the emotion variables and the processing depth variable in parallel as mediators in these models, we chose to model them separately as this more accurately reflects our theoretical derivation of H_{2a} and H_{2b}.

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