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Multimodal news framing effects

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Publication date

2017

Document Version

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Citation for published version (APA):

Powell, T. E. (2017). *Multimodal news framing effects*. [Thesis, fully internal, Universiteit van Amsterdam].

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Chapter 3

Framing fast and slow: The processing of visual and textual framing effects

This article is under review.

An earlier version of this article won a Young Scholar Top Paper Award in the Visual Communication Division at the 66th Annual Conference of the International Communication Association, June 9, 2016 in Fukuoka, Japan. The title of the paper was: 'Framing fast and slow: The processing and duration of visual and textual framing effects'.

Abstract

Human reasoning can be characterised by discrete information processing pathways – one that is fast, intuitive and emotional, and another that is slow, deliberative and rational. Despite theoretical linkages, no studies have empirically connected these pathways with the processing of visual and textual media. Tools from Chaiken's *heuristic-systematic* theory are employed in a framing effects paradigm to test whether the effects of news visuals and text take place via heuristic and systematic information processing pathways, respectively. To do so I combine experimental manipulations and individual differences data collected across two experiments using different political issues. Results from experimental manipulations provide evidence consistent with discrete processing pathways for visuals and text. However individual differences data paint a more complex picture. This study integrates concepts from framing and persuasion research to shed new light on multimodal media effects, with clear implications for journalism practice and citizens' political reasoning.

News stories are very often told through a combination of text and images, which interact to frame our understanding of an issue. Everyday experience and psychological research tells us that vivid news visuals are eye-catching and can have an immediate emotional impact on the reader (e.g., Garcia & Stark, 1991), whereas the attached text elaborates the substance of a story and its meaning (e.g., Messaris & Abrahams, 2001). However, despite a burgeoning literature on visual media effects (e.g., Coleman, 2010; Gibson & Zillmann, 2000; Gadarian, 2014; Grabe & Bucy, 2009), little is known about *how* the unique qualities of visuals and text combine to affect citizen's opinions and behaviour. In this study I assess whether visual and textual media influence political decision-making via distinct information processing pathways. In doing so I shed new light on the mechanisms of *multimodal* framing effects.

News frames are “interpretative packages” employed by journalists to make complex stories more comprehensible (Gamson & Modigliani, 1989, p.3). Frames emphasise a particularly salient aspect of an issue, which, depending on the individual characteristics of the reader, can affect how they think about it. In turn, this can influence opinions and behaviours (Scheufele & Tewksbury, 2007). The contribution of visuals and text to this process can be considered by the way in which they are processed (Geise & Baden, 2014). Generally, vivid visuals are eye-catching, perceived quickly, and can have an amplifying effect on our psychological processes by fostering an emotional connection with the reader which endures in memory (e.g., Barry, 2005; Paivio, 1991). By comparison, text is less salient but its syntactic structure lends itself to cognitive deliberation and, in turn, a more prescribed construction of meaning (Messaris & Abrahams, 2001). It follows, then, that visuals and text are subject to qualitatively different processing pathways – with visuals more automatically and emotionally processed than the systematic and cognitive processing of text.

These contentions have received indirect support from studies of dual processing pathways underpinning human memory (Lang, Potter & Bolls, 1999; Paivio, 1971, 1991), reasoning (Epstein, 1994; Evans & Stanovich, 2013; Kahneman 2011) and persuasion (Chaiken, 1980; Petty & Cacioppo, 1986). Building on Chaiken's (1980) *heuristic-systematic theory* in particular, a select few studies have attempted to clarify the position of message modality in these models (Pfau et al., 2000; Sparks et al., 1998). Key findings show that complex messages are more persuasive when delivered through text, whilst simple messages are best conveyed using visuals (Chaiken and Eagly, 1976). And those who possess a more affective processing style prefer visual advertisements, whereas those with a cognitive processing style prefer text (Sojka & Giese, 2006). However, no studies have explicitly tested whether these distinct processing pathways underpin visual and textual framing effects.

To address this question I adopted concepts and tools from heuristic-systematic theory and employed them in a framing effects paradigm combining experimental

manipulations *and* individual differences measures. Across two experiments using different political issues, participants were asked to read an online news report containing different pairings of contrasting image and text frames from international affairs news. Whilst doing so, they were randomly assigned to conditions in which heuristic and systematic processing was either experimentally-induced or measured via standardised scales. Then, by measuring opinions and donating behaviour I assessed whether these different information processing styles pushed effects in the direction supported by the framed image or text. In doing so, this study makes two important theoretical and empirical contributions: 1) first empirical evidence of the mechanisms of multimodal framing effects; and 2) a test for the inclusion of frame modality in dual-processing models of persuasion – bringing together two typically separate strands of media effects research.

Visual and verbal components of news framing

A modest but growing body of literature has examined the ability of media visuals to influence political opinions and behaviours (e.g., Brandtner, Lobinger & Wetzstein, 2011; Geise & Baden, 2014; Grabe & Bucy, 2009; Scharrer & Blackburn, 2015). This work – referred to as visual framing effects research – has shown that different images can alter the perception of an accompanying text (e.g., Gibson & Zillmann, 2000; Gibson, Zillmann & Sargent, 1999; Pfau et al., 2006), with effects contingent on variables such as interest in the issue (Arpan et al., 2006; Domke et al., 2002). However, studies have rarely considered the combined effects of visuals and text (e.g., Nagel, Maurer & Reinemann, 2012), let alone *how* these effects occur. That is the focus of the present study.

To establish the contribution of different modalities to media effects, prior research has manipulated the congruence of visual and textual information. Congruence refers to whether the visual and textual inputs (or, for TV news, the audio and visual) are matching or not. Manipulating congruence in this way has been used to determine the contribution of visuals and text to media learning and memory (e.g., Drew & Grimes, 1987; Lang, 1995; Reese, 1984) and, more recently, to political opinions and behaviour (Powell et al., 2015; Boomgaarden et al., 2016; Seo & Dillard, 2016). This body of work has hinted at different mechanisms for visual and textual framing effects. Specifically, effects of visuals are mediated by participants' emotional responses (Brader, 2005; Iyer, Webster, Hornsey & Vanman, 2014), whilst textual effects are moderated by issue-specific knowledge (Powell et al., 2015). This distinction conforms to the mode-specific communication potentials of images and text (Coleman & Wu, 2015; Geise and Baden, 2014; Paivio, 1991) and suggests that processing of visuals and text could weigh more heavily on emotion and cognition, respectively.¹ A congruence design was used to test this proposal and examine whether image and text effects are strengthened under different information processing conditions.²

Information processing and message modality

The distinction between emotion and cognition in information processing is grounded in dual processing-accounts of reasoning, decision-making and persuasion (Chaiken, 1980; Epstein, 1994; Evans & Stanovich, 2013; Kahneman 2011; Loewenstein, Weber, Hsee & Welch, 2001; Petty & Cacioppo, 1986; Zajonc, 1980). These theories have in common two different modes of processing that guide decision-making. Namely, one that is fast, intuitive and emotional, and another that is slow, reflective and cognitive. These pathways mirror the fast and subconscious route through which our brains initially process visual stimuli – directly from thalamus to amygdala, the originator of affective reactions (Lang et al., 1999; Tamietto & de Gelder, 2010). Compared to the necessarily slower and conscious processing of textual stimuli via neocortex (Barry, 2005; Pessoa & Adolphs, 2010).

Despite this theoretical and anatomical link, to our knowledge no media effects studies have explicitly connected these distinct processing pathways to message modality. However, dual-route theories of persuasion, in particular *heuristic-systematic theory* (Chaiken, 1980), come closest. *Systematic* processing is an analytic orientation in which the recipient engages in detailed processing of message content to evaluate its conclusions. In contrast, *heuristic* processing minimises detailed processing and focuses on the use of accessible and intuitive decision-rules to form opinions based on a subset of information. Although modality was not a defining characteristic of Chaiken's model, she did contend that the often-persuasive decision cues possessed by visual messages (Hovland, Janis & Kelley, 1953) sit naturally within the heuristic processing pathway (Chaiken & Eagly, 1983). In contrast, the qualities of text lends itself to conveying information to the reader (Chaiken and Eagly, 1976) potentially via processing that is more systematic and elaborative. Despite this parsimonious distinction and wealth of research on dual processing models of persuasion that followed (e.g., Petty & Cacioppo, 1986), there is only tentative empirical support for this notion (Lang et al., 1999; Pfau et al., 2000; Sparks et al., 1998).

In this study I employed measures and manipulations from the heuristic-systematic model to study the mechanisms of visual and textual framing effects. I did so using a dual-method approach in which the research question was evaluated via *both* experimental manipulation and individual differences data. This follows the tradition of previous dual processing research (Evans & Stanovich, 2013; Petty & Cacioppo, 1986) but an efficient design was used to obtain these insights in a single study which was repeated for two different political issues.

The two experimental manipulations used are the mainstay of dual processing studies of persuasion. The first involves stimulating participants' *cognitive involvement* (for a meta-analysis see Johnson & Eagly, 1989). By increasing the personal importance of a persuasive communication (Chaiken, 1980; Petty & Cacioppo, 1986) participants

are encouraged to systematically scrutinise a message. In contrast, applying a *cognitive load* whilst participants read a message (e.g., Buller, 1986) disrupts working memory and forces participants' processing towards the heuristic pathway (Evans and Stanovich, 2013). In this study I manipulate *both* cognitive load and involvement, and, in doing so, go beyond previous studies that typically only manipulate one processing pathway. Based on the purported link between visuals and heuristic processing, and text being well-suited to systematic elaboration, I expect that:

H1a: Framing effects of visuals will be greater under heuristic processing compared to systematic processing conditions.

H1b: Framing effects of text will be greater under systematic processing compared to heuristic processing conditions.

Individual differences in processing style

In addition to experimental manipulation, I tackle our research question by measuring individual differences in *dispositional* processing style. The Need for Cognition scale (Cacioppo & Petty, 1982) indexes one's intrinsic motivation to engage in and enjoy thinking. Those who score highly report expending more cognitive effort in evaluating messages and exhibit performance on experimental tasks equivalent to systematic processing conditions (e.g., Cacioppo, Petty & Morris, 1983; Griffin, Neuwirth, Giese & Dunwoody, 2002; Priester & Petty, 1992). In contrast, the Need for Affect measures an individual's tendency to seek out and enjoy feelings (Maio & Esses, 2001; Sojka & Giese, 1997). Those with a high need for affect are motivated to approach emotion-inducing situations and tend to use feelings and source-based cues to form judgments, akin to heuristic processing (Chaiken, 1987; Slovic et al., 2007). As such, these measures provide indicators of participants' general tendency to engage in cognitive/systematic and affective/heuristic information processing.

Much evidence links affective and cognitive processing styles with message modality. Since images are effective at eliciting an affective response (Iyer & Oldmeadow, 2006) it follows that those with a high (compared to low) need for affect should be more strongly influenced by emotionally-charged visuals (see also Arceneaux & Vander Wielen, 2013). By contrast, those with a high (compared to low) need for cognition score highly on verbal intelligence scales (Cacioppo, Petty, Feinstein & Jarvis, 1996) and gain more knowledge from newspaper use (a primarily textual medium; Liu & Eveland, 2005). Moreover, marketing research shows that cognitive processors have a more positive attitude towards an advertisement after viewing it in textual form. In contrast, affective processors are more positive towards the visual modality (Sojka & Giese, 2006). Finally, studies drawing on multimedia learning theory (Mayer, 2009) have linked

processing style to one's preference for visual or verbal information in daily life. The Style of Processing Scale (Childers, Houston & Heckler, 1985) includes, for instance, whether one tends to use mental imagery or written notes, or prefers instructions in diagrammatic or written form. Those with a more visual or verbal learning style were more affective and cognitive processors, respectively (Sojka & Giese, 2001).

In this study I assessed whether a tendency to adopt an affective/cognitive and visual/verbal processing style relates to the magnitude of visual and textual framing effects. Based on the association between visuals and affect and text and cognition, I expected that:

H2: Framing effects of visuals will be greater for individuals with a:

- a) high need for affect compared to low need for affect.*
- b) visual processing style compared to verbal processing style.*

Framing effects of text will be greater for individuals with a:

- c) high need for cognition compared to low need for cognition.*
- d) verbal processing style compared to visual processing style.*

The experimental setting

These hypotheses were tested in two experiments employing the same design, but focusing on different international affairs issues with two different sets of news frames. This approach provides an indication of the reliability of the findings and improves the generalisability of conclusions (Jackson, 1992; Reeves et al., 2015).

The first experiment used the context of military intervention in the little known ongoing conflict in the Central African Republic (CAR). The majority Christian country was plunged into turmoil in 2013 when Muslim rebels seized power. Despite international efforts and pressure for western intervention, violent responses from mostly Christian militias displaced over twenty percent of the population leading to humanitarian crisis.³ Two frames were prominent in coverage of the CAR conflict that have also been a steady feature of Western news coverage of war and conflict for the last thirty years.⁴ The first emphasises the moral *obligation to intervene* in the conflict. This frame is typified by graphic images of suffering victims ("empathy framing"; Robinson, 2002), encouraging intervention to prevent further human rights abuses. The counter-frame to this exhorts the *risks of intervention*. Here, images of belligerent militants emphasise potential dangers that confront allied troops in far-flung conflicts and the costs of becoming bogged down in a lengthy struggle (Entman, 2003).

The second experiment used the issue of the ongoing refugee crisis in Europe and the Middle East. The crisis reached its peak in 2015, displacing the majority of the Syrian population and leading to the biggest influx of refugees to Europe since the second

world war. Images of families and children in distress – particularly the publication of the image of Alan Kurdi on 2nd September 2015 – magnified the plight of refugees, and typified the portrayal of *refugees as victims*. The ensuing public outcry encouraged governments across Europe to take steps to prevent further atrocities. However, over time, politicization of the crisis by the far-right and a few prominent violent flash points contributed to an increasingly prominent counter-frame depicting *refugees as intruders*. Here, images of large numbers of (often hostile and especially male) refugees portrayed them as dangerous strangers posing a threat to Europe’s safety and cultural and economic achievements. Framing refugees as victims (e.g., Van Gorp, 2005, 2006) and intruders (e.g., Batziou, 2011; Bleiker, Campbell, Hutchison & Nicholson, 2013) is common media practice.

Experiment 1 Method

To test the hypotheses I used the CAR conflict (Experiment 1) and refugee crisis (Experiment 2) contexts in two online survey-embedded experiments. An online experiment provides many of the benefits of a typical lab experiment: random assignment of participants to conditions, systematic manipulation of variables, and control over extraneous sources of variance to provide causal insights about independent and dependent variables. As such, this method is well suited to examining the processing of media messages in an online setting in which news is often encountered.

Design

Participants were randomly assigned to eighteen conditions, arranged in a two (*image frame*: obligation, risk) by three (*text frame*: obligation, risk, control) by three (*processing style*: heuristic, systematic, control) factorial design. In order to assess individual differences in information processing, participants in the ‘control’ processing conditions were asked to complete additional questions measuring dispositional information processing style. This enabled us to test (Hyp. 2a-d) whether a general tendency to adopt a certain processing style influenced visual and textual framing effects in the absence of experimental manipulation.

Participants

A total of 1547 American adults aged 18 to 86 were recruited via Amazon Mechanical Turk in October 2015.⁵ Of these, 163 either failed an attention check question or failed to complete over half of the survey. Two participants were excluded who took unusually short (<5 mins) or long (>3hrs) to complete the survey. 19 participants were removed for ‘straight-lining’ behaviour. 23 participants were also removed who reported a

problem viewing the article or complained of not having enough time to view it.⁶ The final sample contained 1340 participants. The median time to complete the experiment was 15min 18s.

The sample was fairly representative of the U.S. population (United States Census 2010) for age ($M = 38.36$, $SD = 13.08$) and sex (698 females, 52%). Participants came from a variety of racial backgrounds, although most were white (74%) and US-born (89%). Participants possessed a range of educational backgrounds and political ideologies.

Stimuli

Stimuli were selected from media coverage of the ongoing conflict in the Central African Republic (CAR), as previously used in Powell et al. (2015). Three pilot experiments were used to arrive at images and texts that conveyed the respective frames and, importantly, that were matched for several factors that have been shown to influence media effects (e.g., Lang, 1995; Schuck & de Vreese, 2006). This included perceived arousal, valence, salience, ambiguity, complexity, and credibility. This information can be seen in full in Powell et al. (2015) and so are not described in detail here. In short, the images clearly depicted victims of the conflict in the obligation condition and belligerent militants in the risk condition. The articles were downloaded from the BBC website and were shortened and matched in length, and modified to achieve the framing conditions.⁷ An example incongruent stimulus combining an obligation article with a risk image can be seen in *Appendix B1*.

Procedure

Upon entering the survey, questions measured participants' interest in politics and foreign affairs, issue-specific knowledge of the conflict in CAR, and political orientation. Participants were then randomized to one of the stimulus conditions, which were presented on a blank screen. In the *control* processing condition participants were merely asked to read the article and answer the questions that followed.

In the *heuristic* processing conditions, a cognitive load was placed on participants whilst they read the article. This was done through an auditory 1-back task which involved clicking the computer mouse when the pitch of a piano note was higher in comparison to the one immediately preceding it (i.e., 1-back). Piano notes were separated in time by approximately five seconds and participants were given the opportunity to practice the task beforehand. Performance on the sound task was incentivized by informing participants that the top 50% most accurate would be awarded a small additional financial bonus. This was done to increase participants' reliance on the heuristic processing pathway when reading the article.

In the *systematic* processing condition, participants were told that they would take part in a debate on the topic of the article after completion of the survey. Specifically,

they were informed that they would be redirected to an online forum in which they would have to justify their judgements made in the survey to a subject matter expert and a fellow participant. Similar to the heuristic condition, participants were told that the top 50% performers in the debate would be awarded a small additional financial bonus. By explicitly manipulating load and involvement in these ways *both* the heuristic and systematic processing routes were activated. Moreover, by using a non-verbal auditory working memory task as a cognitive load and a debate for inducing involvement, the manipulations were orthogonal to the visual and verbal inputs assessed.

In all conditions participants were forced to spend at least 30 seconds viewing the stimulus, and the survey automatically continued after 90 seconds. This was done to ensure that participants in the heuristic (load) condition could not compensate for reduced processing capacity by spending more time viewing the article. The pre-tests and standard average reading times showed this was an appropriate timeframe. In all conditions, participants were clearly told about the time they were given to view the article. After viewing the stimulus, participants responded to the dependent measures, followed by manipulation check questions. At the end of the survey participants were asked to provide basic personal information, including age, sex, education level, race and country of birth.

Measures

Dependent variables. Support for the policy of military intervention in CAR was measured with three items (e.g., “*Sending an international peacekeeping force*”; 1 = *strongly oppose*, 7 = *strongly support*; $\alpha = .86$; $M = 4.81$, $SD = 1.31$). Actual donating behaviour was measured by awarding a financial bonus of 35 cents to *all* participants, instead of only 50% of the top performers as they were earlier informed. Then, at the end of the survey, participants were given the option to either keep the bonus or donate some or all of it to a charity in support of the conflict in CAR (an *International Committee of the Red Cross* campaign; $M = 12.96$ cents, $SD = 14.70$).⁸

Moderator variables. Measures of trait processing style were included only for the six control processing conditions. These measures were taken in a follow-up survey so that they were as far removed from the stimulus as possible, thus minimising the possibility that the experimental conditions influenced these measures and vice versa.⁹

Participants’ trait preference for affective processing was measured using the 11-item Need for Affect scale (NfA; Sojka & Giese, 1997; $\alpha = .92$; $M = 4.45$, $SD = 1.21$). Preference for cognitive processing was assessed using the 18-item Need for Cognition scale (NfC; Cacioppo, Petty & Kao, 1984; $\alpha = .96$; $M = 3.51$, $SD = 0.91$). Preference for visual or verbal processing was assessed using the 22-item Style of Processing scale (SoP; Childs, Houston & Heckler, 1985; $\alpha = .73$; $M = 2.58$, $SD = 0.30$; low scores indicate visual preference and high scores a verbal preference). The mean score on each of the trait processing style variables were comparable with previous research (e.g. Arceneaux &

Vander Wielen, 2013; Berinsky, Huber & Lenz, 2012; Sojka & Giese, 1997; Sojka & Giese, 2006). Examples of items and scoring scales can be seen in *Appendix B3*.

Manipulation Checks

Manipulation checks from the pre-tests detailed in Powell et al., 2015 confirmed that the framing manipulations were achieved. The success of the processing pathway manipulations was confirmed in the main experiment using four items measuring information processing depth, adapted from Wolski and Nabi's (2000) *elaboration depth measure*. Further details can be found in *Appendix B3*.

Analysis

Effects of the experimental manipulations of information processing were tested using a three-way ANOVA: including image frame, text frame and processing pathway as between subject's factors. Moderation of framing effects by dispositional processing styles was analysed with the control processing conditions using Hayes PROCESS-macro in SPSS (Hayes, 2013). The obligation and risk image and text frames were entered separately as the independent variables, and each processing style measure as was entered as a moderator. Each analysis was conducted on the two dependent variables: support for intervention in the conflict and donation amount.¹⁰

Experiment 1 Results

Processing pathway manipulations

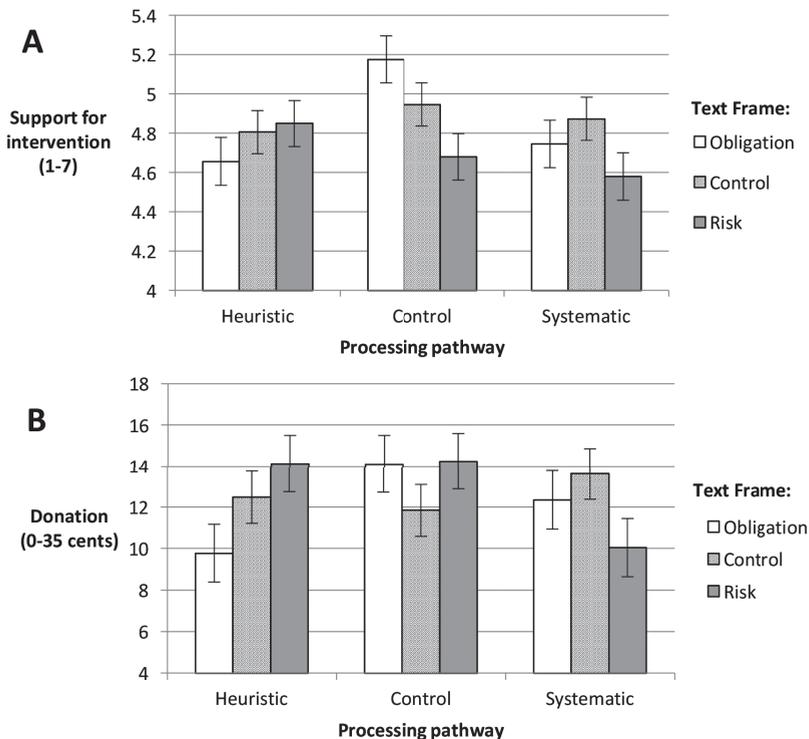
There was a main effect of image frame on participants' support for intervention in CAR, $F(1, 1139) = 3.93, p = .048, \eta_p^2 = .003$. Support was higher in those who viewed a stimulus with an obligation image ($M = 4.89, SD = 1.22$) compared to a risk image ($M = 4.75, SD = 1.41$). This was superseded by a significant text-by-processing interaction, $F(4, 1139) = 2.51, p = .041, \eta_p^2 = .01$. In the heuristic processing conditions, post hoc tests showed no difference in support for intervention between those who saw the different text frame conditions. In contrast, in the control processing conditions support for intervention was significantly higher for those who read an obligation ($M = 5.17, SD = 1.11$) than a risk text ($M = 4.68, SD = 1.35, p = .001$), and higher for the control ($M = 4.95, SD = 1.24$) than risk text ($p = .085$). In the systematic processing conditions, there was also higher support for those who saw a control text ($M = 4.87, SD = 1.35$) compared to a risk text ($M = 4.57, SD = 1.55, p = .082$). See *Figure 3.1A*.

The same pattern of results was observed for donation behaviour (see *Figure 3.1B*). The main effect of image frame on participants' donations approached significance, $F(1, 1051) = 3.27, p = .071, \eta_p^2 = .003$. Again, this was superseded by a significant text-by-

processing interaction, $F(4, 1051) = 2.57, p = .037, \eta_p^2 = .01$. In the systematic processing conditions, donations were higher for those who read a control text ($M = 13.61, SD = 14.52$) than a risk text ($M = 10.05, SD = 14.17, p = .068$). No differences were observed between the text frames for those under control processing conditions. In the heuristic processing conditions there were significant differences in donations between the text frame conditions, but in the opposite direction to expected. Those who read a risk text ($M = 14.17, SD = 14.28$) donated more than those who read an obligation text ($M = 9.77, SD = 13.43, p = .028$).

Taken together, these results partially support hypotheses 1a and 1b. *Systematic and control processing conditions influenced framing effects in the direction promoted by the text frame.* However, inducement of heuristic processing did not push effects in the direction conveyed by the image frame.

Figure 3.1. Mean differences between the text frame and processing pathway conditions for (A) support for intervention, and (B) donation.



Note. Both Panel A and Panel B above show a text frame by processing pathway interaction. Means and standard errors are plotted. Note that the y-axes on both charts do not reflect the full range of the scales.

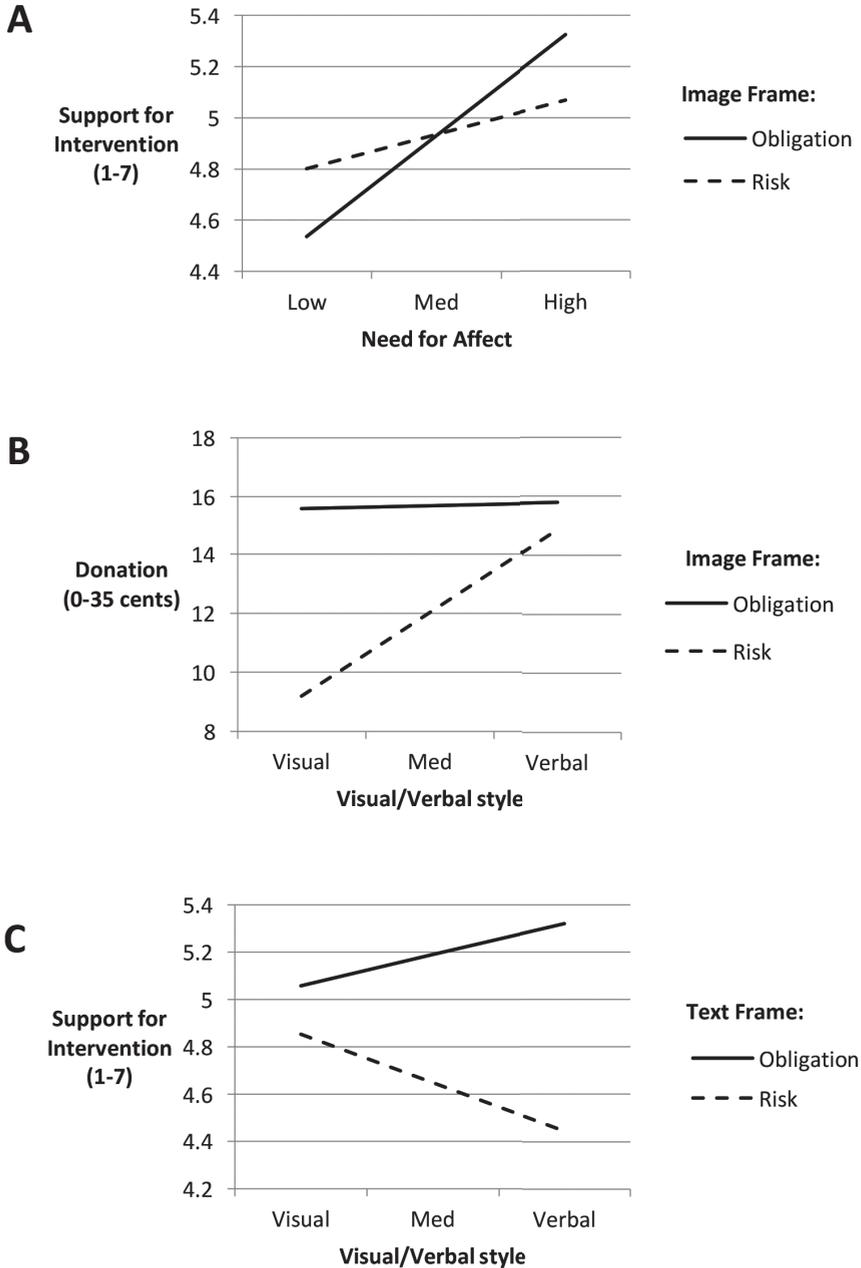
Moderation by processing style

The effect of the image frame on support for intervention was moderated by participants' NfA, R^2 change = .01, $F(1, 371) = 4.00$, $p = .046$. Probing the interaction (see Figure 3.2A) showed that those with high NfA were more supportive of intervention after viewing a stimulus with an obligation image compared to a risk image, $MDiff = -.26$, $t = -1.39$, $p = .16$. In those with low NfA this was reversed: participants were more supportive after viewing a stimulus with a risk image than an obligation image, $MDiff = .27$, $t = 1.44$, $p = .15$. NfA did not moderate the effects of the text frames. Furthermore, participants' NfC did not moderate the effects of the text frames nor the image frames for either of the dependent variables.

Visual-verbal processing style moderated the effect of image frames on participants' donations, R^2 change = .01, $F(1, 368) = 3.21$, $p = .073$, albeit just short of conventional significant levels in a two-tailed test. Those with a visual processing style donated more after viewing a stimulus with an obligation image compared to a risk image, $MDiff = -6.41$, $t = -2.97$, $p = .003$. In contrast, those with a verbal processing style were not influenced by the image frames (see Figure 3.2B). In addition, the effect of the text frames on participants' support for intervention was moderated by visual-verbal processing style, R^2 change = .02, $F(1, 247) = 4.35$, $p = .038$. Verbal processors were more supportive of intervention after reading an obligation text compared to a risk text, $MDiff = -.87$, $t = -3.86$, $p < .001$. In visual processors, the text frames had little to no effect (see Figure 3.2C).

These results show that *those with a high need for affect were more strongly influenced by the frame of the images in our stimulus articles (H2a)*. However, those with a high need for cognition did not show a more pronounced effect of the text frames (H2c). *Furthermore, those with a more visual/verbal processing style were more influenced by the frame of the image/text, respectively (H2b & H2d)*.

Figure 3.2. Moderation of framing effects by individual differences in (A) need for affect and (B - C) visual-verbal processing style. Note that values of the dependent variables are plotted for each frame condition at the mean and + and - 1 SD of the moderator variable.



Experiment 1 Discussion

Taken together, Experiment 1 provided support for the proposal of distinct processing pathways to visual and textual framing effects. Evidence for the systematic processing of text comes from increased textual effects in our experimental manipulations of systematic (and control) processing. Support for the heuristic processing of images comes from individual differences data showing moderation of image effects by need for affect. Further support comes from the moderation of image and text effects by participants' visual and verbal processing style, respectively.

Not all results supported our hypotheses, however. Absent from the findings of our experimental manipulations of processing pathway was the connection between images and heuristic processing. Inducement of heuristic processing did not push framing effects in the direction of the image. One possible methodological cause of this could be the timing restriction given to participants. Most of those who were removed for not having time to read the article complained that there was insufficient time to read the article and complete the sound task concurrently. Although steps were taken in the pretests to ensure the timing was sufficient, in Experiment 2 this issue was rectified by shortening the stimulus articles.

Also absent in the findings was increased text effects in those with a high need for cognition. Although it is not possible to draw conclusions from null findings, one possible reason could be that those with a high need for cognition possess relatively stable attitudes that are resistant to change (see Haugtvedt & Petty, 1992). Experiment 2 provides another opportunity to test this using different stimuli material about a different political issue.

Experiment 2 Method

Experiment 2 tested the same hypotheses using a different context – the European refugee crisis. A Dutch sample was used since this issue is highly relevant to the Netherlands, and because using a different nationality would – in addition to using a different topic, stimuli, measures and sample – provide a more convincing replication of the findings from Experiment 1.¹¹ The core part of the study, the design and procedure, remained the same as Experiment 1, except for the topic-specific frame conditions. Details of the new sample, stimulus materials and measures follow.

Participants

1388 Dutch adults aged 18 to 75 were recruited via an online data panel company, SSI Survey Sampling in early August 2016. The same exclusion criteria were used as

Experiment 1, leading to a final sample of 1249. The median time taken to complete Experiment 2 was 12min 19s.

The sample was fairly representative of the Dutch population (CBS, 2016) for age ($M = 46.71$, $SD = 16.67$) and sex (633 females, 51%). 95% of participants were born in the Netherlands and 38% had at least one parent who was not born in the Netherlands. Again, there was a range of educational backgrounds and political ideologies.

Stimuli

Stimuli were selected from media coverage of the European refugee crisis. The same pilot testing procedure from Experiment 1 was used to select stimuli for Experiment 2. This ensured that the stimuli conveyed the victim and intruder frames and, again, were matched for arousal, salience, ambiguity, complexity, and credibility (the pre-tests are described in detail in *Appendix B4*).

The selected victim image (from *Human Rights Watch*) depicted a young boy pulled from a boat as a victim of the crisis and the selected intruder image (from *Ruptly TV*) showed violent refugees crowding around a fence. Stimulus texts were adapted from articles from the BBC News and UN High Commission for Refugees webpages. A few words and phrases were carefully changed in each condition to convey refugees as suffering victims, burdensome intruders, or a balance between the two for the control version. The victim and intruder versions were similar in length (112 words and 117 words, respectively) with the control version necessarily slightly shorter (108 words).

When combining the images and text, two additional images were added containing simple graphics of the statistics behind the crisis. One showed the proportion of the Syrian population affected and the other showed numbers of asylum applications in Germany and the rest of Europe. These two graphics were added to all versions of the articles and thus were the same for all conditions. Since a typical online news article contains more material than a simple headline, image and text, this addition enhanced the external validity of our stimuli without compromising internal validity. An example incongruent stimulus combining a victim image with an intruder text is in *Appendix B2*.

Measures

Dependent variables. Opposition to Syrian refugees was measured using the question, “*Syrian refugees are a burden on the country because they take our jobs and social benefits*” (1 = *strongly disagree*, 7 = *strongly agree*; $M = 3.94$, $SD = 1.70$). Donating behaviour was measured by awarding a financial bonus of 25 cents to all participants in the same manner as Experiment 1. This time, participants were asked to indicate (yes/no) whether they would like to donate to a charity supporting Syrian refugees (*Doctors Without Borders*). Participants who clicked *yes* ($N = 127$, 10.3%) were shown the link to the campaign page

on which they could make a donation, whilst those who clicked *no* ($N = 1104$, 89.7%) continued directly onto the next page of the survey.

Moderator variables. In order to shorten the overall time of the survey some of the scales for the moderating variables were reduced. In line with previous studies (Bakker & Lelkes, 2016; Bullock, 2011), a 6-item NfC scale was used and formed a reliable scale ($\alpha = .72$, $M = 4.31$, $SD = 0.93$). The SoP scale was also reduced to 12 items from the full 22-item version (Childs, Houston & Heckler, 1985; $\alpha = .64$, $M = 2.43$, $SD = 0.31$). The same 11-item NfA scale used in Experiment 1 was also used in Experiment 2 ($\alpha = .90$, $M = 4.53$, $SD = 1.00$). The items in the shortened NfC and SoP can be seen in *Appendix B3*, including the steps taken to reach the shortened SoP scale.

Manipulation Checks

Manipulation checks from the pilot experiments and main study detailed in *Appendix B4* confirmed that the framing manipulations were successful. The processing pathway manipulations were assessed in the same manner as Experiment 1. Processing depth differed significantly across the processing conditions, $F(2, 1232) = 38.57$, $p < .001$. Stimuli were processed significantly more deeply in the systematic ($M = 4.25$, $SD = 1.12$) and control processing conditions ($M = 4.31$, $SD = 1.10$) than the heuristic conditions ($M = 3.69$, $SD = 1.04$, both comparisons $p < .001$). However the difference between the systematic and control conditions was non-significant ($p = .447$). The relatively larger difference between the heuristic condition and the other two conditions was also present in Experiment 1 (although all differences in Experiment 1 were significant, see *Appendix B3*), and should be borne in mind when interpreting the results.

Analysis

The analysis routine remained almost the same as in Experiment 1. The only exception was analysis of the binary donation variable, for which logistic regression was used. Here the image and text frame variables were included model, as well as the image-by-processing and text-by-processing interactions.

Experiment 2 Results

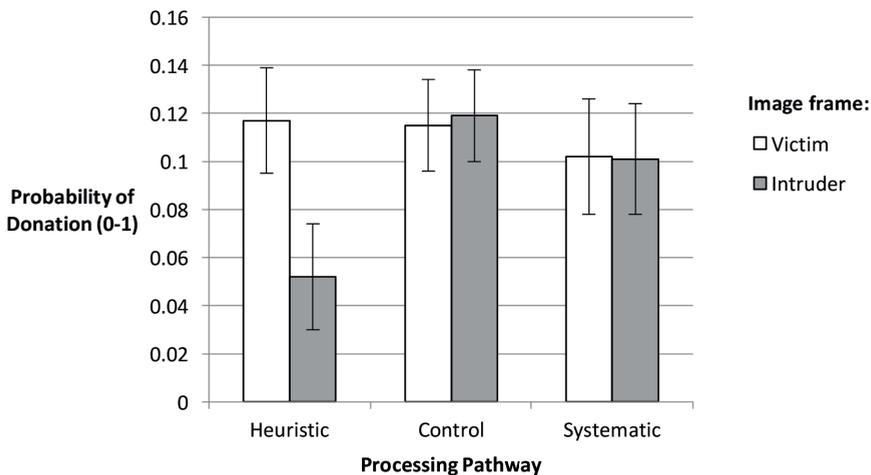
Processing pathway manipulations

There were no significant main effects or interactions observed for the opposition to refugees variable. However, for the donation variable there was a significant effect of image frame, $b = -0.90$, $ExpB = 0.40$, $SE = 0.37$, $p = .016$. Those who viewed a stimulus with a victim image were more likely to donate than those who saw an intruder image. This was superseded by an image-by-processing interaction, which was significant

between the heuristic and control processing conditions, $b = 0.98$, $ExpB = 2.67$, $SE = 0.44$, $p = .025$, and borderline significant between the heuristic and systematic processing conditions, $b = 0.86$, $ExpB = 2.36$, $SE = 0.48$, $p = .072$. Participants were more likely to donate after seeing a stimulus with a victim image than an intruder image under heuristic processing conditions, but not under control or systematic processing conditions (see Figure 3.3).

Results partially support hypotheses 1a and 1b. *Heuristic processing conditions influenced framing effects in the direction promoted by the image frame.* However, inducement of systematic processing did not push effects in the direction conveyed by the text frame.

Figure 3.3. Interaction between the image frame and processing pathway conditions for probability of donation. Means and standard errors are plotted. Note that the y-axis on the chart does not reflect the full range of the scale.



Moderation by processing style

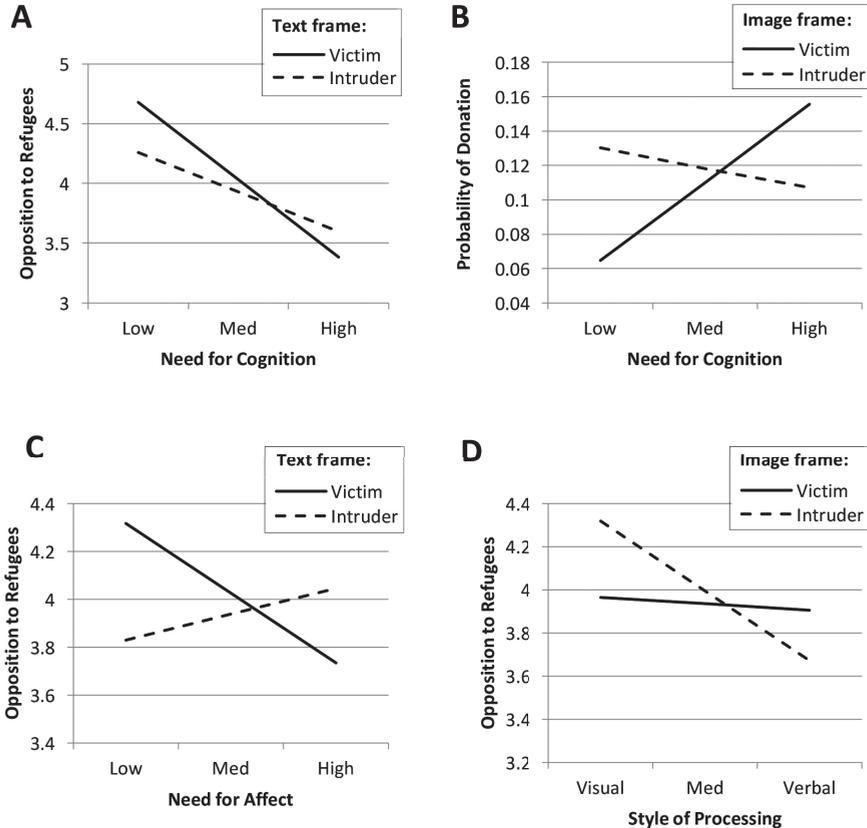
The effect of the text frames on participants' opposition to refugees was moderated by NfC, R^2 change = .01, $F(1, 329) = 3.00$, $p = .085$. Probing the interaction (see Figure 3.4A) showed that those with high NfC were less supportive of refugees after reading a stimulus with an intruder text compared to a victim text, whereas the opposite was true for those with a low NfC. NfC also moderated the effects of the image frames on participants' donating behaviour, $b = -0.65$, $SE = 0.31$, $Z = -2.11$, $p = .034$. Those with a high need for cognition donated more after viewing a stimulus with an intruder image

than an intruder image. The opposite was true for those with a low need for cognition (see *Figure 3.4B*). Separately, participants' NfA moderated the effect of the text frames on their opposition to refugees, R^2 change = .01, $F(1, 329) = 4.38$, $p = .037$. Those with a high need for affect were less supportive of refugees after reading an intruder text than a victim text. The opposite was true for those with a low need for affect (see *Figure 3.4C*).

Participants' style of processing moderated the effect of the image frames on opposition to refugees, R^2 change = .01, $F(1, 502) = 3.65$, $p = .056$. Those with a more visual processing style were less supportive of refugees after viewing a stimulus with an intruder image than a victim image. This was not the case for participants with a more verbal processing style (see *Figure 3.4D*). The same moderation result was observed for donation behaviour, $b = -1.43$, $SE = 0.70$, $Z = -2.04$, $p = .041$. Participants with a more visual (compared to verbal) processing style donated more after viewing a stimulus with a victim image than an intruder image. Participants' visual-verbal style of processing did not moderate the effect of the text frames, neither for opposition to refugees nor donating behaviour.

These results provide partial support for H2c: *Those with a high NfC were more strongly influenced by the text frames, however they were also influenced by the frame of the images.* In opposition to H2a, *the effect of the text frames was stronger in those with a high NfA.* Furthermore, *visual processors were influenced by the frame of the image (supporting H2b), but there was no pronounced effect of text frames in verbal processors (H2d).*

Figure 3.4. Moderation of framing effects by individual differences in (A-B) need for cognition, (C) need for affect, and (D) visual-verbal style of processing. Values of the dependent variables are plotted for each frame condition at the mean and + and - 1 SD of the moderator variables.



Experiment 2 Discussion

Results from Experiment 2 provide some support for the notion of separate processing pathways to visual and textual effects, albeit less convincing than Experiment 1. Evidence for heuristic processing of images comes from our processing pathway manipulations where strong effects of the image frames were observed under heuristic processing conditions. The link between images and heuristic processing was also evidenced by the moderation of image effects by SoP. And the moderation of text effects by NfC supports the link between text effects and systematic processing. However, the individual differences data also produced results that ran counter to our expectations:

Image effects were stronger in those with a high NfC and text effects were stronger in those with a high NfA. In the following section I integrate and discuss these results with the findings from Experiment 1.

General Discussion

These two studies combined experimental manipulations and individual differences data to investigate the processing pathways that underpin visual and textual framing effects. Across two experiments using stimuli from two different political issues, support is found for the notion that the effects of visuals and text occur via relatively more heuristic and systematic processing pathways, respectively (e.g., Chaiken and Eagly, 1976; Sojka & Giese, 2006). The experimental manipulations of processing pathway showed converging evidence for this contention, whilst individual differences data (particularly from Experiment 2) painted a more mixed picture. Given the body of research indicating different processing of images and text (e.g., Lang et al., 1999; Paivio, 1991), I expected to find more convincing evidence for distinct pathways to multimodal media effects.

That notwithstanding, across the two experiments our manipulations of processing pathway show converging support for heuristic and systematic routes to visual and textual effects. Experiment 1 showed that inducing systematic processing increased the magnitude of textual effects, while Experiment 2 showed heuristic processing conditions led to increased visual effects. Taken together, these findings establish a *causal* link between heuristic and systematic processing and visual and textual framing effects. However, non-identical results across the two experiments show that a dual-pathway explanation does not hold for all news topics and/or stimuli. In light of past research this can be expected. For instance, Chaiken & Eagley's (1976) early study into the heuristic-systematic model manipulated message complexity to show that complex messages were more persuasive via text, whereas simple messages were most persuasive via images. If text is indeed prone to systematic processing, it follows that a more complex (compared to simple) text should show stronger framing effects under systematic conditions. This was indeed the case for Experiment 1, where the stimulus text was longer and rated in the pretest as more ambiguous and less clear than the text from Experiment 2.¹² Although I chose not to systematically manipulate these variables in our study and thus cannot draw firm conclusions in this regard, this illustrates how the characteristics of a news article could produce different processing and effects, and highlights the importance of research using multiple message exemplars and careful stimulus pretesting (Reeves, Yeykelis & Cummings, 2015). Of course, it is also possible that factors of the issue – for instance complexity, salience, perceived importance and

emotionality – could also engage systematic and heuristic pathways to different extents. Systematic examination of such contextual and stimulus characteristics would help to establish the veracity of the causal link between images and text and heuristic and systematic processing observed in this study.

Mixed results from the moderation analyses imply more nuance than simple discrete pathways to visual and textual effects. Counterintuitive findings using the NfA and NfC scales in Experiment 2 suggest a weaker link between images and the tendency to use feelings, and text and the tendency to think. Emotion researchers have argued that those with a high NfC may also be better able to integrate emotions, such as those elicited by a news image, into a more holistic mental representation of the issue at hand (Kühne, 2012; Maio & Esses, 2001). It follows, then, that donation behaviour of high-NfC participants was influenced by both the images and the text frames in Experiment 2. Moreover, like any other news story, our texts contained emotional language. Therefore it is plausible that high-NfA participants in Experiment 2 were particularly receptive to these aspects of the text and adjusted their opinions about refugees accordingly. Ultimately, the correlational nature of these analyses should be borne in mind: Inspection of bivariate correlations between NfC, NfA and our dependent variables show significant relationships between these moderator and outcome variables, as well as other variables such as issue-specific knowledge.¹³ Thus, although there is a sound theoretical basis for using NfC and NfA as indicators for systematic and heuristic processing, as with any correlational analysis such measures also share variance with other potentially confounding participant characteristics. As such, I argue that these moderation analyses provide a relatively weaker test of the hypotheses than the causal insights obtained through the experimental manipulations of processing pathway (e.g., Jackson, 1992).

That said, the results of participants' visual and verbal processing style suggest that distinct dispositional processing styles *can* produce consistent visual and textual effects. In both experiments visual processors were strongly influenced by the image frames, and in Experiment 1 verbal processors were influenced by the text. This extends research on modality-specific styles of learning and memory (e.g., Mayer, 2009) to political opinions and behaviour. To further this line of inquiry, future studies could more closely examine information processing typologies. For instance, “combined processors” exist who possess a highly affective and cognitive processing style, or are highly receptive to both visual and verbal modalities (Sojka & Giese, 2006, p. 997). In contrast, “low motivation” processors (i.e., low affect, low cognition, or low visual, low verbal) may be a reasonable characterization of the way in which particularly apathetic citizens process news frames.

This study has several limitations. In Experiment 1 the processing pathway manipulation checks showed significant differences between all processing conditions,

albeit the difference between the control and systematic conditions was relatively small. In Experiment 2 the difference between control and systematic conditions was non-significant, which appears to be reflected in the similar effects on our dependent variables. However, since the relatively deep processors (i.e., systematic and control) showed stronger effects of text in Experiment 1 and shallow processors (i.e., heuristic) showed strong image effects in Experiment 2 this does not affect the veracity of our conclusions, but may have reduced the size of the observed effects. It is probable that these results are at least in part due to social desirability demand characteristics influencing manipulation checks in the control condition, which future studies should seek to minimize. Separately, using a shortened 6-item version of the NfC may have contributed to the unexpected moderation results in Experiment 2. However, since this version of the NfC is well established (Bakker & Lelkes, 2016; Bullock, 2011), and since the full NfA inventory was used, this cannot fully explain the anomalous results. Finally, this study necessarily forced participants into viewing the framed stimulus articles. In reality, citizens self-select into content, which could influence information processing and effects in ways that cannot be accounted for in this study (e.g., Garret, 2009).

The practical implications of this study are twofold. Firstly, viewing conditions can have a meaningful influence on framing effects of visuals and text: Those who foresee debating a news issue can be more influenced by a story's text, and those who listen to distracting music can be more influenced by news images. Journalists could exploit these findings, for instance by including a debate/chat function alongside news content to encourage deeper processing of arguments in their articles. Concurrently, media users should bear these factors in mind when reading the news. Secondly, those who tend to rely on visual or verbal thinking in daily life will be more readily influenced by news images and text, respectively. This has implications for emerging online formats in which users can choose, tailor or personalize the content and modality to their own preferences (Bas & Grabe, 2015; Nguyen et al., in press; see also [blendle.com](https://www.blendle.com)). The qualities and effects of such personalized visual political communication is a prime avenue for future research.

Finally, this study makes important theoretical contributions. By using manipulations and measures from the persuasion literature to shed new light on multimodal framing effects, this study connects two typically separate fields of media effects research (for a related theoretical consideration see Chong & Druckman, 2007). This study is, to the best of my knowledge, the first to empirically position message modality in dual-processing theories of persuasion. Furthermore, this approach suggests that framing theory can be enriched by employing concepts from psychology and persuasion to complement the currently underspecified concepts of applicability and accessibility (Scheufele & Tewksbury, 2007). Indeed, rather than abandoning emphasis framing (Cacciatore, Scheufele & Iyengar, 2016), this study shows that the paradigm can yield externally valid

insights, which, when combined with well-specified constructs from broader media effects literature, equips researchers with the toolkit to study multimodal framing effects.

Notes

¹ Due to the complimentary role of emotions and cognition in human decision-making (Damasio, 1996) I avoid reifying the role of emotions and cognition in political judgments (Erisen, Lodge & Taber, 2014; Geise & Baden, 2014). As such, visual and textual processing and effects are characterised as *relatively* more emotional and cognitive, respectively.

² Because this study is focused on processing pathways underpinning multimodal framing effects, no hypotheses are offered on the outcomes of the basic congruence manipulation. However, since a control processing condition was included (in which no specific processing style was induced) a replication of the studies described can be attempted. This analysis is shown at *Appendix B5*.

³ In our stimuli care was taken not to label the warring factions as Christian or Muslim, in order to minimise the possibility of religion biasing the results.

⁴ *Obligation* and *risk* frames rose to prominence during U.S. media coverage of the conflicts in Somalia, Rwanda and the Balkans (Entman, 2003; Robinson, 2002). They have also been used heavily in recent coverage of deliberations over military intervention in Libya in 2011, Syria in 2013, and in Iraq and Syria from 2014 to 2016. Moreover, the *obligation* frame promotes the responsibility to protect civilians from human rights violations, which is also grounded in international law (“Responsibility to Protect”; United Nations, 2000). A selection of recent news media reporting from many instances is listed in *Appendix B6*.

⁵ The principal motivation for the use of *MTurk* in this study (implemented via the *MTurk-R* package in *R*) was its provision of considerable control and flexibility over participant contact and donation collection, to an extent that is not provided by most data collection companies and participant pools. Furthermore, a growing body of research shows that the quality of *MTurk* samples is comparable to other participant pools (Berinsky et al., 2012; Hauser & Schwarz, 2015; Leeper & Mullinix, 2014; Mullinix, Leeper, Druckman & Freese, 2015; Paolacci, Chandler, & Ipeirotis, 2010).

⁶ This was captured in a free-text response box. For those with insufficient time their comprehension of the article was checked using four multiple choice answer questions (e.g., “*What kind of intervention was called for in the article?*”, $M = 2.53$, $SD = 1.08$). These participants scored 1 out of 4 or less on this measure, suggesting their reports were accurate.

⁷ The obligation and risk versions were 277 and 278 words, respectively, whereas the control version was necessarily shorter (209 words) due to the removal of words and phrases used to achieve the frame manipulations.

- ⁸ A total of \$280 was raised by the participants and donated to the *International Committee of the Red Cross*. All participants were re-contacted and informed of this after the study.
- ⁹ All participants in the control processing conditions were invited to complete the follow-up survey. Of the 435 who completed the main experiment 375 completed the follow-up survey (86%). Only those who completed the follow-up were included in the moderation analyses.
- ¹⁰ Inspection of the donation data showed that it was not normally distributed – with inflated tails at either end of the scale. However, there is much evidence to suggest that the ANOVA's *F* test performs well under conditions of non-normality (Donaldson, 1968; Lumney, 1970). As a robustness check the donation scores were recoded into a binary variable (i.e., donated or not) and the analyses in the Results section were replicated using logistic regression. Findings were the same using this alternative method of analysis.
- ¹¹ Translations of measures and stimulus materials from English to Dutch were conducted using the widely accepted translation-back-translation method, with the authors resolving any discrepancies in the translations.
- ¹² An independent-samples t-test showed a significant difference in clarity of the text used in experiment 1 and 2, where 1 = very ambiguous and 7 = very clear: $M_{Exp1} = 4.80$, $SD_{Exp1} = 1.55$, $M_{Exp2} = 5.29$, $SD_{Exp2} = 1.20$, $p = .020$.
- ¹³ In Experiment 1, NfC was correlated with support ($p = .005$), donations ($p < .001$) and issue knowledge ($p = .010$), and NfA was correlated with support ($p < .001$) and issue knowledge ($p = .007$). In Experiment 2, NfC was correlated with opposition ($p < .001$) and issue knowledge ($p < .001$).