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WHAT A DIFFERENCE A DAY MADE? THE EFFECTS OF REPETITIVE AND COMPETITIVE NEWS FRAMING OVER TIME¹

Manuscript under review

Abstract

Based on a “classic” framing experiment ($n = 1,324$), this study empirically tests the dynamic nature of framing effects over time. We integrate (1) multiple frame exposures as well as (2) various tests for duration of framing effects into our design. Our results show that exposure to repetitive news frames has a consolidating effect on opinion formation. This effect is stronger the shorter the delay between two exposures. Competitive news framing is characterised by recency effects; i.e. the latest frame has the strongest impact on opinion formation. Political knowledge functions as a moderator for both effect mechanisms. Participants with higher levels of political knowledge are less prone to recency effects, but more likely to develop a consolidation effect. The results of this study have important methodological and substantive ramifications for framing effects research, as well as for our understanding of the real-life impact of framed media messages on public opinion.

Introduction

Kahneman (2000) wrote that framing effects are “less significant for their contribution to psychology than for their importance in the real world” (p. xv). But, how valuable are existing results in framing research in terms of this real-life adaptability? A majority of news framing effect studies *do* emphasize the relevance of their results for actual politics or political communication (e.g., Berinsky & Kinder, 2006; Nelson, Oxley, & Clawson, 1997; Valkenburg, Semetko, & de Vreese, 1999). The substantive and methodological foundations of such conclusions are, however, still unclear. So far, only a fraction of studies have actually empirically assessed the persistence of their results in a real-life context.

This of course does not invalidate existing studies. Framing studies have provided a solid theoretical and empirical foundation from which future studies can depart to evaluate how “the apparent variability of opinion as a function of the framing of an issue” must be understood (Sniderman & Theriault, 2004, p. 145). In recent years, researchers have begun to consider tests of the *duration of effects* as one necessary development of the study of framing effects (e.g., de Vreese, 2004; Druckman & Nelson, 2003; Tewksbury et al., 2000). Only by investigating duration, goes the argument, can we make convincing statements about the significance of existing findings, and refute criticism of the “value” of framing theory for politics and political communication (Gaines, Kuklinski, & Quirk, 2007; Tewksbury & Scheufele, 2009).

Recently, we suggested that framing effects evoked by a single news frame can be relatively persistent, with visible effects even a full two weeks after exposure (Lecheler & de Vreese, 2009a). These results support claims of the real-life applicability of framing effects (see also Tewksbury et al., 2000). However, they have also opened up a plethora of new questions on the role of framing effects in a dynamic media use scenario. Consequently, we propose a more advanced account of the duration of framing effects. Following claims by Gaines et al. (2007) and others, in this study we measured effect duration across a number of delayed time points. However, we also enriched our design with multiple frame exposures over time, some repetitive, others competitive in nature (e.g., Sniderman & Theriault, 2004). In doing so, we mimicked a dynamic media use scenario, and moved one step further in the direction of a more “realistic” study of news framing (see also Chong & Druckman, 2008).

Our theoretical framework takes its starting point in the psychology of framing effects, and the influences of repetitive and competitive exposure on framing effects. We then combined these insights with recent results on the duration of framing effects. Embedded in a “classic” framing experiment, we tested the magnitude of a framing effect immediately and at four delayed time points. In addition, we investigated the effects of re-exposure to either a repetitive or a competitive news frame. We investigated the conditionality of the found effects, and in particular the role of political knowledge as a moderator. It is our aim to advance the temporal dimension in framing research. We believe that, for too long, framing effect studies have relied

on the mere assumption that their results can be generalized and used to make predictions about real-life politics.

The Effects of Repetitive and Competitive News Framing

Investigating news framing effects is fascinating, because it offers the researcher a tool to explain why “(often small) changes in the presentation of an issue or an event produce (sometimes larger) changes of opinion” or other outcome variables (Chong & Druckman, 2007a, p. 104). Framing scholars have undertaken considerable effort to produce a coherent theory of framing effects (e.g., Chong & Druckman, 2007a; Entman, 1993; Scheufele, 2000). While there are still open questions, frames can generally be defined as patterns of interpretation that are used to classify information and process it efficiently. Frames stress certain aspects of reality and push others into the background, they have a selective function. In this way, certain attributes, judgments, and decisions are suggested (e.g., Scheufele, 2000).

Framing studies typically employ either equivalency or emphasis frames. Equivalency frames refer to logically alike content, which is presented or phrased differently (see e.g., Kahneman & Tversky, 1984). Emphasis frames are closer to “real” journalistic news coverage and present “qualitatively different yet potentially relevant considerations” (Chong & Druckman, 2007a, p. 114). Research has, moreover, worked with two alternative operationalizations of frames in the news, namely issue-specific and generic frames (Semetko & Valkenburg, 2000). Issue-specific frames pertain to a specific topic, while generic news frames are applicable to a wide range of topics. The wide application of generic frames makes it easier to compare framing effects across issues and generic frames have thus been utilized in framing experiments (see e.g., Lecheler, de Vreese, & Slothuus, 2009 for a recent example). It is, moreover, important to note that generic news frames used in empirical framing studies are in most cases characterized by a specific valence. This valence pertains to one of the most fundamental characteristics of political discourse, namely that (political) elites attempt to purposively affect support or rejection for an issue by emphasizing the positive or negative aspects of it. According to de Vreese and Boomgaarden (2003), valenced emphasis frames have the capacity to affect opinion on and support for an issue, while neutral emphasis frames are more likely to affect issue interpretation (see also Bizer & Petty, 2005).

Studies often take a rather microscopic view of the influence of news frames on how citizens make sense of politics. This means that, in their design, these studies have very successfully measured the effects of only *one* frame at a time (e.g., Nelson et al., 1997). Building on this strong empirical foundation on the “existence” of framing effects, a necessary next step is to evaluate the “meaning” of these effects in a more realistic setting that adheres to the dynamics of day-to-day news use. In this respect, research has yet to deliver a satisfying account of the role of news framing *within* politics, where the dynamics of argumentation, dispute, and consensus are the order of the day. Such an endeavor can build upon the groundwork of Zaller (1992,

1996), who developed a comprehensive model for the effects of dynamic media communication flows on opinion formation. According to Zaller, the media only have a substantial effect when their content is repeatedly presented in one consistent way; i.e. it must be *one-sided* (see also Noelle-Neumann, 1973; Peter, 2004). *Two-sided information*, the exposure to competing and conflicting messages, leads to an annulment of potential media effects (see also de Vreese & Boomgaarden, 2006a). Political communication can thus involve either the (1) *repetition of* or (2) *competition between* news frame messages over time and the outcome of these two is likely to vary. The existing literature on framing processes offers a number of explanations for the psychological mechanisms that may underlie these different effects.

Repetitive exposure to news frames has been addressed regularly, albeit often not in a systematic way. Rather, a number of scholars have incorporated multiple exposures to the same news frames as a means to achieve greater “experimental realism” in their designs. Berinsky and Kinder (2006, p. 644), for instance, presented a treatment consisting of five repetitive frames. The authors argued that, in doing so, they were able to capture “the ways in which different media outlets could present the same information in qualitatively different ways” (see also Valkenburg et al. 1999). Yet, these studies do not address how framing effects stemming from multiple exposure compare in magnitude and process to effects of being exposed to only one frame.

The influence of repeated framing has, nevertheless, been widely discussed elsewhere. A number of political communication scholars have argued that repetitive news framing leads to a higher and more constant level of *accessibility* (e.g., Iyengar, 1991; Price & Tewksbury, 1997; Cappella & Jamieson, 1997; Nabi, 2003). This argument is based on psychological literature, which sees repetition as one of the major determinants of strong and stable attitudes (e.g., Holland, Verplanken & van Knippenberg, 2003). Price and Tewksbury (1997) incorporated the concept of repetitive exposure into their framing effect model and argued that frequent repetition heightens the accessibility of applicable information, and thus guarantees the influence of a frame on a long term basis as well. Similarly, Iyengar (1991) found that, at least in politics, people rely most on information that is continuously made accessible to them in the news media (see e.g., Cappella & Jamieson, 1997; Nabi, 2003).

Repetition also resonates in research on learning, memory and recall: Judd and Brauer (1995), for instance, argued that repetition leads to a strengthening of mental links between an attitude object or issue and related beliefs, which enables individuals to retrieve evaluative judgments connected to this issue more aptly. This argument is reminiscent of more recent studies of framing, which have found that the level of entrance applicability also decides the strength and longevity of a framing effect. Accordingly, framing effects depend “on individual evaluations of the quality of frames” and not on how often they were received (Chong & Druckman, 2007b, p. 651). We believe that accessibility and applicability must be understood not as contradictory, but as complementary factors. Heightened accessibility increases the

likelihood of stable attitude changes. However, if entrance applicability levels are low, repetition is likely to be ineffective (see e.g., Baden, 2009; Matthes, 2007).

Competitive news framing has received quite a bit of attention in political communication and framing literature, possibly because the study of dispute and dissent is one of the most fascinating aspects in political communication research (Neuman, Just, & Crigler, 1992). As elucidated above, Zaller (1992, 1996) argued that exposure to two-sided information should lead to the obliteration of media effects, as conflicting measures simply cancel each other out. Several framing scholars have successfully tested this proposition. Sniderman and Theriault (2004) had one additional condition in their experimental design, where two competing news frames were presented at the same time. Results indicated that competitive framing increased the influence of personal beliefs and decreased the effects of news framing (see also Hansen, 2007). These findings indicate a strong connection to the basic principles of motivated reasoning (Chong & Druckman, 2007a; Druckman & Bolsen, 2009), where the so-called “disconfirmation bias” stands as a central mechanism that “protect[s] or even bolster[s] ... prior attitudes and beliefs in the face of discrepant evidence” (Taber, Cann, & Kucsova, 2009, p. 138; see also Kunda, 1990; Taber & Lodge, 2006). Chong and Druckman (2007b, p. 651) elaborate on these findings, and examine the effects of competitive framing with frames of varying strengths.² They show that competitive framing “tend[s] to stimulate individuals to deliberate on the merits of alternative interpretations”, which increases the potential of rejecting “weaker” frames in communication.

Framing research has, thus, widely explored the influences of repetitive and competitive news framing on the magnitude as well as the process of framing, and has shown that repetitive framing has the potential to strengthen framing effects, whereas competitive framing may annihilate these effects and enable a return to extant personal beliefs and values as the foundations of political attitudes. Yet, the results of repetitive and competitive news framing studies have mostly been based on one-shot experimental settings, where the magnitude of the framing effect was tested only immediately after exposure to a frame. Thus, the robustness of the effects over time remains an open question.

Dynamic Framing Effects over Time

What happens when multiple news frames are presented sequentially, across longer stretches of time? What role does the length of the period between two frame exposures play? Without knowing more about the duration and persistence of framing effects, researchers cannot make convincing arguments about their significance for daily politics. Along these lines, Gaines et al. (2007) strongly advocated the use of survey experiments to test news framing effects, but only if these are enriched with a focus on *both* multiple exposures and the duration of effects.

The study of the duration of framing effects is still in its infancy, with only a handful of rather straightforward studies published. Researchers have tested the duration of framing effects by exposing participants to one strong news frame, followed by one immediate and one delayed

measurement (e.g., Druckman & Nelson, 2003). Noticeably, very little reasoning for the exact length of the chosen interim period was provided. One group of researchers has concluded that framing effects dissipate quickly (e.g., de Vreese, 2004; Druckman & Nelson, 2003), whereas a second group argued that framing effects can be persistent over time (e.g., Lecheler & de Vreese, 2009a; Tewksbury et al., 2000). None of the existing studies specifically discussed why and when a framing effect would be persistent *enough* to be called “lasting” as opposed to “transitory” or “fleeting” (see Gaines et al., 2007). On a more general level, we question the quality of a lasting or non-lasting news framing effect if this result only holds in the vacuum of a single exposure.

Above we discussed the effects of a consonant and repetitive news frame flow on the magnitude and process of framing effects. Initially, based on the given assumptions about heightened accessibility through repetition, one could assume that a sequence of repetitive frames over time would function as a multiplier of effects: the more exposure, the stronger the effect and so on (e.g., Price & Tewksbury, 1997). However, such an accessibility-based model of repetitive framing must take into account the expected rate of decay of accessibility itself. We assume that any steady flow of consonant news framing includes a “dry spell” during which no exposure takes place. How does such a gap in exposure affect the expected influence of repetition on a framing effect? According to Feldman and Lynch (1988), accessibility dwindles quickly, depending on how much time has elapsed since the last activation. The exact rate of decay depends on a number of factors, such as the total number of repetitions so far, and the strength and stability of related attitudes (see also Fazio, 1995). In politics, aside from a small number of highly contended issues, previous exposure to political issues is likely to be limited, and the literature suggests that political attitudes are volatile (Zaller, 1992). Thus, given the decline of accessibility and the special characteristics of political issues, we assume that repetition only has a mildly strengthening influence on initial framing effects, because any additive effects are watered down by the time that elapses between two exposures (Zaller, 1996).

A model of repetitive framing effects must also consider that individuals will *learn* the information that is presented to them repeatedly. Here, learning can mean the gradual acquisition of new belief considerations (e.g., Slothuus, 2008), or the learning of an evaluative judgment connected to a news frame (e.g., Matthes, 2007). Yet, rates of forgetting limit this learning process over time, even though forgetting is held to be a much slower process than accessibility-decay (e.g., Hovland & Weiss, 1951; Lodge et al., 1995). Thus, repetition may also function as a decelerator of forgetting. With every repetition, new or already forgotten information is “filled-in”. We assume that the cognitive process that underlies repetitive news framing is a combination of both accessibility-based and learning-based mechanisms, with the extent to which each process applies depending on a number of individual or contextual characteristics, such as the total number of repetitions or prior beliefs (e.g., Fazio, 1995). We will discuss some of these characteristics in the next section.

In sum, we hypothesize that the effects of repetitive framing are of a consolidating or stabilizing nature: repetition plays certainly a role in strengthening and reinforcing an effect, but is limited by the delay between two news frame exposures. Considering a decline in accessibility levels and forgetting, we assume that the consolidating effect should be more pronounced, the shorter the period between repeated exposures. Our hypotheses read as follows:

H1a: If an individual is repeatedly exposed to the same news frame over time, initial framing effects are consolidated. [*consolidation hypothesis*]

H1b: This consolidation effect is more pronounced, the shorter the interim period between two exposures is.

Research on the effects of competitive framing has focused on how the presentation of two contradictory news frames at the same time changes the magnitude and process of framing effects (e.g., Sniderman & Theriault, 2004). Studies in the field have shown that competitive framing leads to an annulment of effects, as individuals rely on personal beliefs and values when confronted with conflicting information. Along these lines, only news frames with high levels of applicability produce significant effects in competitive environments (Chong & Druckman, 2007b). What role does competitive framing play when frames are presented across longer periods of time? Given the apparent instability of framing effects in competitive scenarios, one could model competitive framing over time as an ineluctable back and forth between the two conflicting messages. This is reminiscent of one of the more prominent findings in the psychological literature on memory and knowledge: that of serial position effects, where the first (primacy effect) and the last item (recency effect) in a list are more dominant in recall than items placed in the middle (see e.g., Howard & Kahana, 2002; Murdock, 1962; Neath, 1993). Results stemming from, for instance, persuasion research confirm the dominance of recency effects in communication, where the latest media exposure shapes attitudes and behavior more strongly (e.g., Carlson & Russo, 2001; Haugtvedt & Wegener, 1994). This positions recency effects in a more accessibility-based model of framing research, where the latest news framing exposure could substantially heighten the accessibility of the framed issue considerations, which in turn might increase the likelihood of this last frame to be considered when forming opinion.

Chong and Druckman (2008) found empirical support for this assumption, and pioneered the temporal competitive exposure approach to news framing research. The authors combined one re-test after three weeks with exposure to different competitive news frames over time. They argued that individuals who are prone to on-line processing³ show a greater amount of inertia, and recency effects are then less likely to occur. Yet, early learning and the retrieval of an extant evaluative judgment at a later point in time are also susceptible to the principles of forgetting. Interestingly, Chong and Druckman also showed that the traditional characteristics of competitive framing, increased deliberation on the issue and a decrease of media influence, do not apply to competitive framing over time. On the contrary, “when competing messages are

received at different points in time, there is no assurance that individuals will deliberately evaluate the opposing arguments” (p. 30).

Given these initial findings, and corroborating research in persuasion and memory-based research, we assume a dominance of recency effects for sequential competitive news framing. Taking diminishing accessibility and forgetting into account, we also assume that this recency effect is stronger the further apart in time the two exposures are. We formulated the following hypotheses:

H2a: If an individual is exposed to competing news frames over time, the most recent frame will be more influential on opinion. [*recency hypothesis*]

H2b: This recency effect is stronger, the longer the interim period between the two exposures is.

Political Knowledge as a Moderator of Framing Effects over Time

A key aim of framing effects research is the specification of the conditions under which framing effects take place, and the determination of which variables either enhance or limit them (e.g., Druckman, 2001; Lecheler et al., 2009; Shen & Edwards, 2005). Political knowledge has emerged as an important moderator of susceptibility to framing effects (e.g., Cappella & Jamieson, 1997; Price, Tewksbury, & Powers, 1997). Yet, evidence of the role of political knowledge within the framing process is divided. Some scholars suggest that less knowledgeable individuals are more susceptible to framing effects, because of their inability to counter-argue a framed message (e.g., Haider-Markel & Joslyn, 2001; Kinder & Sanders, 1990; Schuck & de Vreese, 2006). Other studies argue that only knowledgeable individuals can be affected by news framing, because they possess the adequate mental stockpile to understand and process a framed message (e.g. Druckman & Nelson, 2003; Nelson et al., 1997).

Different routes of processing a framed message are thus central to the influence of political knowledge, and a closer look at studies that focus on the underlying psychological mechanisms of framing provides some first answers to conflicting research findings. Traditionally, framing is perceived to be mediated by belief importance change; i.e. by shifting the weights of available and accessible considerations (e.g., Nelson et al., 1997). Naturally, this conception of framing effects requires the availability of a great number of belief considerations, which points to the abilities of more knowledgeable individuals. High knowledge individuals possess a wider variety of available considerations, and can process and integrate framed considerations more quickly and efficiently (e.g., Druckman & Nelson, 2003). However, high levels of knowledge are directly related to strong attitudes, which can obliterate media influences (e.g., Haider-Markel & Joslyn, 2001; Lecheler et al., 2009).

Recently, Slothuus (2008) found that individuals with *moderate* levels of political knowledge were also framed, but primarily via belief content change, i.e., by making new beliefs

available. However, this only applied when they possessed a basic level of related knowledge, which enabled them to process the given information (Zaller, 1992). This leads us to believe that lower knowledge individuals can be framed to a great extent, but via a different route (see also Lecheler & de Vreese, 2009b). The extent to which each path applies hinges on the contextual nature of the issue at stake and the dependent variable tested.

It is the function of political knowledge as a processing variable that matters for the study of framing over time. Based on the above, we assume that individuals with higher levels of knowledge will display more pronounced consolidating effects. If these individuals are framed, then they are able to integrate a continuous communication flow into their mental stockpile quickly. With a wider range of available belief considerations, knowledgeable individuals are also able to associate and embed a frame more easily. We thus predict the following:

H3: The consolidating effect of repetitive news framing is more pronounced for high knowledge individuals. [moderated consolidation hypothesis]

For competitive news framing, we predict that individuals with lower levels of political knowledge will display more susceptibility to a recency effect, because of their inability to integrate and counter-argue a framed message. Knowledgeable individuals, however, will base a later judgment predominantly on the earlier frame encounter, and are therefore less prone to recency effects (e.g., Chong & Druckman, 2008; Haugtvedt & Wegener, 1994). We predict:

H4: The recency effect of competitive framing exposure is stronger for low knowledge individuals. [moderated recency hypothesis]

Method

To investigate the effects of repetitive and competitive news framing over time, we conducted an online survey experiment with five measurement points among a representative sample from the Netherlands. As a research subject, we chose the issue of the enlargement of the European Union (EU). Specifically, we tested news framing effects on support for the economic development of the EU's two newest members, Bulgaria and Romania. Unlike previous EU enlargements, the entry of Bulgaria and Romania into the EU in January 2007 received relatively little media attention. This made our experimental design easier to put into practice, because pre-treatment exposure to one of our generic frames was relatively unlikely (e.g., Chong & Druckman, 2008) and the media coverage in the interim post-exposure periods was limited (e.g., de Vreese, 2004). In our study, we first established whether a generic news frame had a significant immediate effect on our dependent variable opinion. Second, we allocated our sample into subgroups, and traced the effects of repetitive and competitive framing across four delayed

measurement points. Third, we tested the influence of political knowledge on these effects across the groups and across all delayed time points.

General Design

In a single-factor, post-tests only, between-subjects experimental survey design, we initially randomly assigned participants to one of two conditions. These conditions represented two alternative versions of a generic news frame, the “economic consequences” frame. Specifically, one frame pointed out the *opportunities* Bulgaria and Romania presented to the EU market, and was thus positive in evaluative direction. The second frame emphasized the *risks* the two new EU countries pose for the EU market, and was thus negative in valence (see also Schuck & de Vreese, 2006). The use of alternative versions of one generic frame ensures commensurability of the effects across conditions. However, external validity in our study was high, as both the opportunity and risk version of the economic consequences news frame are to be found in real political news coverage on EU integration and enlargement (e.g., Neuman et al., 1992; Schuck & de Vreese, 2006; Semetko & Valkenburg, 2000).

Our design also required participants to be assigned to a frame exposure scenario (repetitive, competitive, single/no re-exposure). We used single exposure as our “control” condition; participants in this group received only one frame at t_1 . To create a clean experimental design, each participant was only tested at a maximum of two points in time. This means that, after being tested immediately after a first exposure (t_1), participants were split up into “time groups” and each participant was assigned to only one additional delayed measurement point: after 15 minutes (t_2), one day (t_3), one week (t_4), and two weeks (t_5). This procedure left us with an overall count of 24 experimental conditions (for an overview, see Appendix A). We made sure that each delayed time group contained an equal number of participants for each condition. During the delayed post-test sessions, participants were re-interviewed on the basis of the same measures that were used in the immediate post-test.

Interim Period

We included a number of variables to control for any intervening influences that might have occurred during the interim period between the first and second measurements. In addition to a number of deflective “filler” questions, the delayed post-test questionnaires used at t_3 , t_4 and t_5 also contained measurements of issue-specific media exposure during the interim period. Results showed that participants had been exposed to a minimal level of issue-specific news pieces during their respective interim period (only six percent of all participants had been exposed to issue-specific news). Second, we asked participants how much attention they had paid to news about Bulgaria, Romania and the EU during the interim period (1 = “no attention” to 4 = “a great deal of attention”). This measurement revealed that participants paid very little attention to related news ($M = 1.26$, $SD = .61$). Third, we asked participants whether they had discussed the issue with someone else (e.g., family or friends) during the interim period (1 = “I

did not discuss it” to 4 = “I discussed it quite a number of times”). Our findings suggested that hardly any participant had discussed the issue ($M = 1.16$, $SD = .57$). Lastly, we conducted a content analysis of all major print media in the Netherlands during the interim period. The results of the interim content analysis showed that there was virtually no relevant news coverage during the data collection period.⁴

Sample

CentERdata at the University of Tilburg (The Netherlands) recruited a total of 1,324 individuals (44.8% female, aged between 16 and 92 [$M = 51.20$, $SD = 15.68$]) from their representative database consisting of approximately 2,000 households across the Netherlands.⁵ Recruitment into the company’s database was done using phone, online and face-to-face contacts. Members of their panels are contacted on a regular basis via an online survey tool and are offered incentives for completing online questionnaires on their home computer. The average response rate for t_1 was 54 percent (AAPOR RR1). The recontact rate for the sample for t_2 was 87 percent ($n = 241$), for t_3 60 percent ($n = 484$), for t_4 82 percent ($n = 320$), and for t_5 79 percent ($n = 279$).

Procedure

The experimental procedure consisted of three main steps per participant: First, all participants completed an online pre-test survey, including questions relating to media use, prior attitudes, and political knowledge. Following this, participants were exposed to one news article containing either of the two economic consequences frames. Then, all participants received the online t_1 post-test questionnaire, containing a manipulation check (see below) and stating the dependent variable.

In the next step, each participant was assigned to a re-exposure group (repetitive, competitive, single/no re-exposure). Also, we divided all participants into several post-test groups (t_2 to t_5). This was done to ensure that no participant would be tested at more than two points in time. We chose this procedure to guarantee a comparable experimental setting, independently of the length of time that had passed between the two exposures (e.g., McDermott, 2002). At completing the t_1 questionnaire, each participant was informed that he or she would be contacted one more time for the purpose of a follow-up study. Participants did not know that they would be asked the same questions again in this follow-up. The delayed repetitive or competitive news frame manipulation and post-test (at t_2 to t_5) were then conducted after the respective delay. Participants in the single exposure group did not receive an additional news frame. Following the delayed post-test, all participants were debriefed.

A between condition randomization check on age, gender and occupation performed at the outset of the analysis revealed successful randomization with no between-group differences for the overall t_1 group. Additional randomization checks for each of the delayed post-test groups

(t_2 to t_5) also showed successful randomization for these subgroups. Conditions also did not differ with respect to our pre-intervention moderator variable of political knowledge.⁶

Stimulus Material

The stimulus material consisted of one news article per condition at t_1 and one additional news article at t_2 to t_5 for the repetitive and competitive treatment conditions. The news articles each contained one version of an economic consequences frame, varied to express either the *opportunities* or the *risks* of having Bulgaria and Romania as new EU member states within the EU market (see Appendices B & G). Articles thus varied both in their arguments and in evaluative direction. Specifically, we manipulated an article about investment in the Bulgarian and Romanian market after the countries' accession in 2007. Given the design of the study, it was better to use constructed rather than actually published news material, as the use of real news coverage would have minimized the commensurability across conditions. We made sure to choose a research issue which can logically be presented in terms of economic consequences, which is the case for EU enlargement (e.g., de Vreese, Peter, & Semetko, 2001; Semetko & Valkenburg, 2000). We undertook considerable effort to adjust the news articles to the common lay-out and journalistic style of day-to-day Dutch news coverage. Following the example of other studies, we kept the basic core information within each news article identical, while some paragraphs in the story pointed out the alternative economic consequences of the issue (see underlined text, Appendices B & G) (e.g., Price et al., 1997).

Manipulation Check

Directly after exposure to our first news frames, all participants were asked to indicate to what extent the article had dealt with the positive or negative consequences of the issue (1 = "strongly agree" to 7 = "strongly disagree"). The check showed successful manipulation. Participants in the positive opportunity condition ($M = 5.94$, $SD = 1.63$) perceived their article to be more positive than participants in the negative risk condition ($M = 2.35$, $SD = 1.93$) ($t(612) = 2.75$, $p < .001$). This allowed the further experimental proceeding with the design and the ascribing of differences between groups in the post-test to the experimental manipulation.

Measures

The dependent variable—*opinion* as in perception of economic benefits of Bulgaria and Romania within the EU market—was measured with two items on a seven-point scale, with higher scores indicating increased support for the issue (t_1 : $M = 3.78$, $SD = 1.33$, t_2 : $M = 3.79$, $SD = 1.32$; t_3 : $M = 3.72$, $SD = 1.29$; t_4 : $M = 3.90$, $SD = 1.37$; t_5 : $M = 3.74$, $SD = 1.36$; Cronbach's alpha = .67; Pearson's $r = .49$, $p < .001$). The moderator variable of *political knowledge* was measured with five factual multiple choice questions on both national and EU politics ($M=2.48$, $SD=1.14$). Differing levels of political knowledge are best measured using factual rather than perceived knowledge on an issue (Delli Carpini & Keeter, 1993). The items were chosen to

ensure a sufficient amount of variation in our sample. EU-related knowledge questions often yield low threshold means, and render an adequate split of a sample difficult (e.g., Schuck & de Vreese, 2006). Extant literature on the definition and measurement of political knowledge indicates that national knowledge can also be used as an indicator in EU-related studies (e.g., Hobolt, 2007). Cronbach's alpha for this scale was .67 (for all measures, see Appendix C).

Also, in an earlier study, we divided our sample of political knowledge into three levels, namely high, low, and moderately knowledgeable (Lecheler & de Vreese, 2009a). In the current study, we could not test three groups due to sample size considerations and thus had to draw on a two-group analysis of high versus low knowledge individuals. We reinforce our sub-group analysis by analyzing interaction effects also, and do therefore deem the present two-group solution to be a good oversight of the effects of political knowledge on framing.

Results

We examined repetitive and competitive news framing over time in two main steps: First, we traced the effects of both frame scenarios across four delayed time points. Then, we tested the conditionality of the found effects, and introduced political knowledge as a moderator variable.⁷

The Consolidation Hypothesis

We predicted that, if an individual is repeatedly exposed to the same news frame over time, framing effects are consolidated or stabilized (*H1a*). There were two repetitive news framing scenarios in our study: (1) exposure to an economic consequences opportunity frame at t_1 , followed by a second opportunity frame at t_n (indicated by "O→O" in the analysis), and (2) an economic consequences risk frame at t_1 , followed by another risk frame at t_n (indicated by "R→R" in the analysis). The first columns of Table 4.1 show the means for all time groups and both repetitive exposure scenarios. The mean comparisons show a remarkable consolidation effect across time. For O→O, all time groups displayed comparable mean levels, with small accumulative shifts, albeit not at a significant level. Participants who were exposed to two risk versions of the economic consequences frame (R→R) also showed consistent opinion levels across all time groups. However, the direction of tendential change between means was not in all groups systematic. Possible explanations for this irregularity are discussed in the next section. Yet, given these results, *H1a* can be supported.

We also predicted that the consolidating effect of repetitive framing exposure is not consistent across time, but likely to be more pronounced the shorter the delay between both exposures is (*H1b*). Mean comparisons indicate that time group t_2 (after 15 minutes) showed almost identical means for both repetitive frame scenarios. Along these lines, time group t_3 (after one day) showed a larger absolute change, or frame shift, between first and second opinion measurement (O→O frame shift = .21; R→R frame shift = .23). However, this level of change did not remain constant across the remaining time points (after one week and two weeks), and it

did also not always occur in the expected direction (after one week: $O \rightarrow O$ frame shift = .03, $R \rightarrow R$ frame shift = .28, after two weeks: $O \rightarrow O$ frame shift = .24, $R \rightarrow R$ frame shift = .25). Overall, our findings did not show a clear pattern, and do thus not support *H1b*.

Table 4.1: Repetitive and Competitive Framing over Time

	Repetitive Framing					Competitive Framing				
	t_1	t_2	t_3	t_4	t_5	t_1	t_2	t_3	t_4	t_5
	$O \rightarrow O$					$O \rightarrow R$				
n=21/25	4.54 (1.71)	4.61 (1.67)				4.10 (1.36)	3.86 (1.17)			
n=44/24	4.31 (1.33)		4.52 (1.40)			4.14 (1.07)		3.81 (1.55)		
n=46/36	4.51 (1.68)			4.48 (1.65)		4.45* (1.21)			3.97* (1.37)	
n=27/33	4.00 (1.68)				4.24 (1.47)	4.46** (1.23)				3.51** (1.25)
	$R \rightarrow R$					$R \rightarrow O$				
n=30/21	3.23 (1.43)	3.30 (1.49)				2.71** (1.29)	3.33** (1.22)			
n=36/38	3.06 (1.33)		2.83 (1.36)			3.32** (1.21)		3.92** (1.18)		
n=34/41	2.98 (1.37)			2.70 (1.51)		3.39** (1.09)			4.03** (1.16)	
n=32/25	3.20 (1.40)				3.45 (1.36)	3.38** (1.55)				3.94** (1.38)

Note. $O \rightarrow O$ = Opportunity Frame—lag—Opportunity Frame; $R \rightarrow R$ = Risk Frame—lag—Risk Frame; $O \rightarrow R$ = Opportunity Frame—lag—Risk Frame; $R \rightarrow O$ = Risk Frame—lag—Opportunity Frame; t_1 = immediate measurement; t_2 = re-measured after 15 minutes; t_3 = after 1 day; t_4 = after 1 week; t_5 = after two weeks; * $p < .05$; ** $p < .01$; *** $p < .001$.

The Recency Hypothesis

For competitive news framing, we predicted that, if an individual is exposed to competing news frames over time, opinion at a delayed time point will be predominantly shaped by the latest frame exposure (*H2a*). We tested two competitive news framing scenarios: (1) exposure to an economic consequences opportunity frame at t_1 , followed by a risk frame at t_n ($O \rightarrow R$), and (2) a risk frame at t_1 , followed by an opportunity frame at t_n ($R \rightarrow O$). Table 4.1 illustrates all mean differences for competitive framing across time groups. The results supported our expectations. The mean comparison showed a “flimsy” framing effect, with significant recency effects for all time points of $R \rightarrow O$ (t_2 : $t(20) = -.295$, $p < .01$; t_3 : $t(37) = -3.22$, $p < .01$; t_4 : $t(40) = -.329$, $p < .01$; t_5 : $t(24) = -.282$, $p < .01$), and two time points for the $O \rightarrow R$ scenario (t_4 : $t(35) = 2.12$, $p < .05$; t_5 : $t(32) = 3.99$, $p < .001$). *H2a* is thus supported.

The above results also provide a first indication for an answer to *H2b*, which states that recency effects are likely to be stronger the longer the interim period between first and second news frame exposure. The results of the over-time mean comparisons only partially support this prediction. Participants exposed to $R \rightarrow O$ displayed significant and strong shifts across all measured delayed time points. However, while all frame shifts occurred into the expected direction, participants in the $O \rightarrow R$ scenario only displayed significant shifts after a somewhat longer interim period, namely after one (t_4) and two weeks (t_5) respectively. *H2b* is thus only partially supported.

Moderated Consolidation Hypothesis

For repetitive news framing, we predicted that the consolidating effect of framing would be more pronounced the higher in knowledge individuals are (*H3*). We took two steps in testing the influence of political knowledge: First, we conducted a subgroup analysis. Second, we tested a regression model, in which we added interaction terms for frame scenario and level of political knowledge.

Table 4.2: Repetitive Framing over Time by Level of Political Knowledge

	High Political Knowledge					Low Political Knowledge				
	t_1	t_2	t_3	t_4	t_5	t_1	t_2	t_3	t_4	t_5
$O \rightarrow O$										
	3.85	3.80				5.18	5.36			
n=10/11	(1.88)	(1.85)				(1.32)	(1.09)			
	4.34		4.62			4.28		4.39		
n=25/19	(1.51)		(1.47)			(1.04)		(1.33)		
	4.85			4.77		4.15			4.18	
n=24/22	(1.41)			(1.75)		(1.29)			(1.52)	
	4.05				4.31	3.87				4.05
n=19/8	(1.66)				(1.45)	(1.82)				(1.52)
$R \rightarrow R$										
	3.43	3.43				2.68	2.93			
n=22/8	(1.45)	(1.59)				(1.30)	(1.20)			
	3.37		3.00			2.16		2.33		
n=27/9	(1.26)		(1.29)			(1.98)		(1.19)		
	3.02			2.57		2.92			2.92	
n=21/13	(1.49)			(1.61)		(1.20)			(1.36)	
	3.38				3.61	2.86				3.13
n=21/18	(1.34)				(1.21)	(1.53)				(1.64)

Note. $O \rightarrow O$ = Opportunity Frame—lag—Opportunity Frame; $R \rightarrow R$ = Risk Frame—lag—Risk Frame; t_1 = immediate measurement; t_2 = re-measured after 15 minutes; t_3 = after 1 day; t_4 = after 1 week; t_5 = after two weeks; *p < .05; **p < .01; ***p < .001.

Table 4.2 shows mean comparisons for high and low knowledge individuals across time. The group comparison suggests some variation between high and low knowledge individuals for both repetitive news framing scenarios. These first results only partially support our assumption of the moderating influence of political knowledge. For instance, for time group t_3 (after one day), frame shift comparisons for $O \rightarrow O$ showed that high knowledge individuals displayed a somewhat stronger shift (= .28) than low knowledge individuals (= .11). A similar pattern can be observed for the negative $R \rightarrow R$ group, where high knowledge individuals showed a clearer pattern of consolidating effects in all time groups except t_5 (after two weeks). In sum, the subgroup analysis offers tentative support for a short-term moderating effect of political knowledge.

Further analysis was provided by an OLS regression model for each time group. We added interaction effects between the respective frame scenario and political knowledge to this model.⁸ The first columns of Table 4.3 show that there was indeed a difference in framing effects according to differing levels of political knowledge. Models t_2 , t_3 , and even t_4 show a moderating effect of political knowledge on absolute change between opinions at t_1 and t_n opinion for the $O \rightarrow O$ frame exposure scenario.⁹ The coefficients indicate that the combination of two positive news frames led knowledgeable participants to a stronger increase in support for Bulgaria and Romania within the EU market than it did for low knowledge participants. In addition, model t_3 also showed a significant interaction between frame exposure to $R \rightarrow R$ and political knowledge. Figure 4.1 illustrates the influence of differing levels of political knowledge in one of our time group results (re-exposure after one day). Our analysis illustrates, however, that results were not consistent across all time groups, which means that only some of our delayed measurements show support for $H3$. This suggests that this hypothesis is in need of adjustment according to the dynamic nature of over time experimentation. However, we believe that we can propose an argument for the short-term effect of political knowledge on the consolidating effect of repetitive framing.

Table 4.3: Explaining the Effects of Political Knowledge on Repetitive and Competitive Framing Exposure over Time (Dependent Variable = Change in Opinion between t_1 and t_n [1-7])

Variable	Repetitive Framing					Competitive Framing				
	Model t_2	Model t_3	Model t_4	Model t_5	Model t_5	Model t_2	Model t_3	Model t_4	Model t_5	Model t_5
O→O Exposure	-.502(.292)	-.237(.323)	-1.04(.483)*	-.748(.584)						
R→R Exposure	.210(.390)	-.610(.392)	-.188(.455)	-.609(.535)						
O→O*Pol. Knowledge	.292(.145)*	.186(.109)*	.373(.178)*	.233(.191)						
R→R*Pol. Knowledge	-.021(.125)	.252(.124)*	.147(.162)	.198(.180)						
O→R Exposure						1.14(.429)**	.737(-4.01)	.063(.457)	.040(.526)	
R→O Exposure						.192(.502)	1.08(.374)**	-.103(.380)	-.988(.504)	
O→R*Pol. Knowledge						-.352(.159)*	-.177(.149)	.081(.157)	.102(.179)	
R→O*Pol. Knowledge						.056(.172)	-.284(.134)*	.137(.146)	.382(.192)*	
Political Knowledge	-.026(.068)	.062(.048)	-.072(.088)	-.182(.106)*		-.026(.082)	.102(.072)	-.072(.081)	-.182(.113)	
Constant	.533(.199)**	.413(.157)**	1.03(.230)***	1.46(.308)***		.533(.240)*	.317(.209)	1.03(.212)***	1.46(.327)	
Adjusted R ²	.03	.07	.01	-.01		.08	.04	-.01	.03	
N	98	199	143	118		93	181	140	117	

Note. Ordinary least squares regression. Data are unstandardized regression coefficients and standard errors (in parentheses), * $p < .05$, ** $p < .01$, *** $p < .001$, all tests are one-tailed; O→O = Opportunity Frame—lag—Opportunity Frame; R→R = Risk Frame—lag—Risk Frame; O→R = Opportunity Frame—lag—Risk Frame; R→O = Risk Frame—lag—Opportunity Frame; t_1 = immediate measurement; t_2 = re-measured after 15 minutes; t_3 = after 1 day; t_4 = after 1 week; t_5 = after two weeks.

Moderated Recency Hypothesis

For competitive news framing over time, we predicted that a recency effect is stronger for low knowledge individuals (*H4*). The means for high and low knowledge individuals in Table 4.4 indicate a difference in recency effects between participants of differing political knowledge in some of the time groups. For instance, in time group t_2 (after 15 minutes), high knowledge individuals were less prone to change in support than low knowledge individuals. A similar pattern can be seen in group t_3 (after one day).

Table 4.4: Competitive Framing over Time by Level of Political Knowledge

	High Political Knowledge					Low Political Knowledge				
	t_1	t_2	t_3	t_4	t_5	t_1	t_2	t_3	t_4	t_5
O→R										
n=11/14	4.00 (1.51)	3.86 (1.24)				4.17* (1.29)	3.50* (1.14)			
n=11/13	4.45 (.789)		4.13 (1.22)			3.88 (1.24)		3.53 (1.79)		
n=22/14	4.72 (1.27)			4.29 (1.25)		4.03 (1.00)			3.46 (1.36)	
n=20/13	4.82** (1.15)				3.87** (1.46)	3.92 (1.18)				2.96 (1.49)
R→O										
n=13/21	2.80** (1.37)	3.53** (1.40)				2.56 (1.20)	3.00 (.755)			
n=18/38	3.52** (1.40)		4.02** (1.35)			3.15* (1.01)		3.82* (1.02)		
n=19/41	3.52** (1.28)			4.42** (1.07)		3.27 (.922)			3.70 (1.17)	
n=11/25	3.18 (1.53)				3.90 (1.04)	3.53 (1.61)				3.96 (1.64)

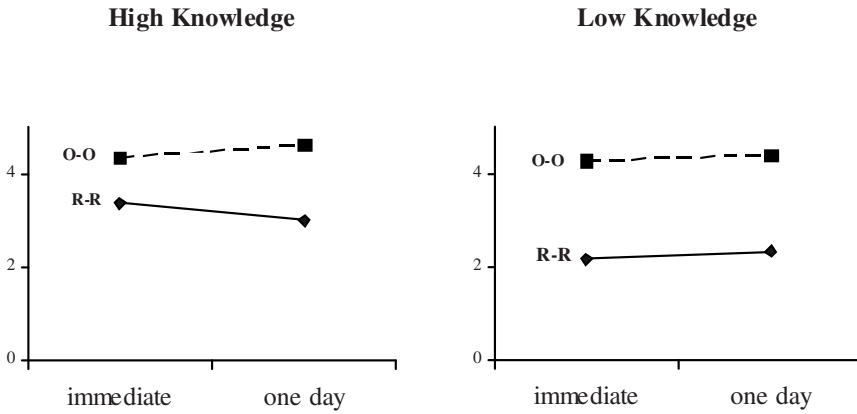
Note. O→R = Opportunity Frame—lag—Risk Frame, R→O = Risk Frame—lag—Opportunity Frame; t_1 = immediate measurement; t_2 = re-measured after 15 minutes; t_3 = after 1 day; t_4 = after 1 week; t_5 = after two weeks; * $p < .05$; ** $p < .01$; *** $p < .001$.

We also tested a regression model for competitive framing, with interaction effects for frame exposure and political knowledge. The models show significant effects of political knowledge on framing effects for two short-term time groups, namely t_2 (after 15 minutes), and t_3 (after one day). The negative coefficients indicate a smaller absolute t_2 change between first and second frame exposure for individuals with higher political knowledge. Figure 4.1 demonstrates change of opinion by political knowledge for participants who were re-framed and re-tested one

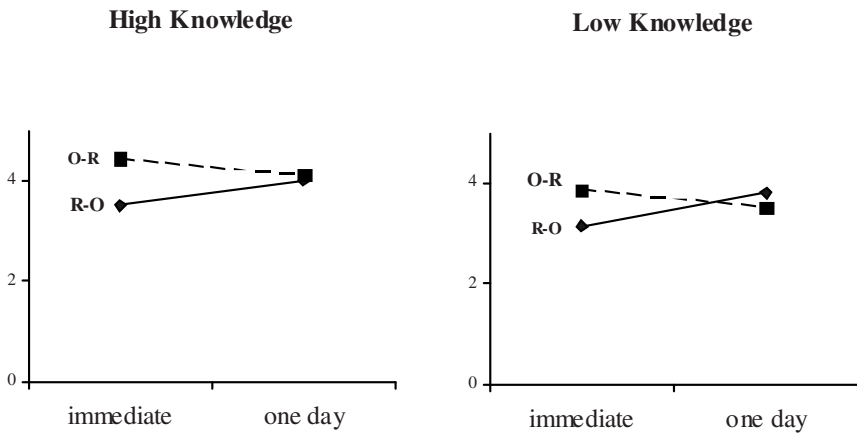
day after initial exposure. *H4* is thus partially supported. Political knowledge only has a short-term effect on the propensity for recency effects.

Figure 4.1: The Moderating Effects of Political Knowledge on Framing Effects - Model *t*₃ (after one day).

(1) Repetitive Framing



(2) Competitive Framing



Note. O→O = Opportunity Frame—lag—Opportunity Frame; R→R = Risk Frame—lag—Risk Frame; O→R = Opportunity Frame—lag—Risk Frame; R→O = Risk Frame—lag—Opportunity Frame.

Discussion

Research has very successfully shown how news frames can affect political opinion and behavior. A necessary next step is to determine what exact role these framing effects play in the political arena, where complex communication processes shape our daily media use (see e.g., Gaines et al., 2007; Sniderman & Theriault, 2004). Accordingly, in this study we discuss the possibilities and benefits of testing the persistence of experimental news framing effects, and enriched our own experimental study with a test of the effects of repetitive and competitive news framing over time.

Our analysis shows that repetitive news framing has a consolidating effect on opinion formation. When a news frame is repeated, effects did not add up, but stayed at a more or less comparable level across time. Competitive news framing in our study was characterized by strong recency effects; i.e. the latest frame exposure was decisive for opinion formation. Yet, for one of our framing scenarios, this only occurred after a longer time lag, namely after one week. Our results also show the influence of differing levels of political knowledge on the dynamic framing process. Against our expectations, political knowledge only exhibited a short-term influence on consolidation and recency effects. When the delay between first and second exposure was relatively short, we detected stronger consolidation and weaker recency effects for participants with a higher level of political knowledge.

The mechanisms shown in this study are substantial for furthering our theoretical and methodological understanding of the study of framing effects. We report a *stable* and consolidated effect in cases where repetition took place, and a *flimsy* framing effect in competitive scenarios. These results support previous theoretical as well as empirical arguments made in political communication literature – and test these by means of a clear experimental design. Our results sustain the idea that repeated exposure to consonant media content enables strong media effects (Zaller, 1992; Peter, 2004). Along these lines, repetition is held to enable both heightened levels of accessibility as well as streamlined learning of applicable information and evaluative judgments (see e.g., Iyengar, 1991). Further research is needed to clarify, to what extent both are present during the process. Our findings also lead us to assume that repetitive news framing is by no means the only key to a strong media framing effect, especially not when repetitive frames are presented sequentially over time and not, as is common in many studies, at the same time. Lastly, the inclusion of longer interim periods between two repetitive frame exposures raises the question, what role recency effects play for repetitive framing, i.e., *when* an initial effect has dissipated to such an extent that individuals can be considered “clean slates”.

Our findings on competitive news framing show that most delayed frame exposures led to a substantial opinion reversal. This supports the results of Chong and Druckman (2008), who reported that the original effects of competition (i.e., a more conscious evaluation of competing messages, which leads to a decrease in media effects) are not valid for competitive framing over time. Rather, “[e]ven when individuals have been previously exposed to alternative frames, they

tend to be susceptible to the most recent frame they encounter, including weak frames” (p. 29-30). These findings seem to bode ill for both a theory of emancipated media users and for long-term framing effects. But, is news framing over time really characterized by a continuous back and forth? One of our news frame scenarios showed that this is not necessarily the case: if the delay between two dissonant frames is short (in our case, up to one day long), then a second frame did not produce significant recency effects. This means that initial frame exposure did play a role in the process. The extent to which first and second frame exposure interact must, however, be subject of future research projects.

We chose political knowledge as the main moderator in our study for a number of reasons: First, we believe that the concept of political knowledge and sophistication is central to the study of political communication, where it can function as a moderator, but also as an independent or dependent variable (see e.g., de Vreese & Boomgaarden, 2006b). Second, we argue that political knowledge is a variable that not only affects the magnitude of framing effects (as tested in extant studies), but also functions as a processing variable. We found that political knowledge had only a short-term moderating influence on repetitive and competitive news framing over time. The “short-term” results can be explained in terms of the propensity of high knowledge individuals to possess higher levels of accessibility, and to process and recall information more quickly than individuals with lower levels of knowledge (e.g., Fazio, 1995; Haugtvedt & Wegener, 1994). As this accessibility diminishes quickly, future studies must concentrate on the role of learning in framing over time and determine, for instance, how many exposures are necessary to learn a news frame over time. We observe that the lack of a long-term moderating influence was also connected to the issue used in this study: EU politics. The chosen issue is generally characterized by low levels of media interest as well as personal importance, which could have resulted in only minimal learning effects over time. In their seminal study on on-line learning, Lodge et al. (1995, p. 315) argue that “recall of campaign information appears dismal even under the best of circumstances, that is, when the information is processed by knowledgeable citizens or is processed in depth.”

Recency effects also depend on a number of other individual or contextual variables, only a few of which we could discuss in this study. Framing scholars should test how, for instance, the strength and nature of prior beliefs, or specific characteristics of the issue at stake, limit recency effects over time (see Chong & Druckman, 2008). Moreover, research on repetitive and competitive framing is necessary in light of Bennett and Iyengar’s (2008, p. 724-5) remarks on the increasing fragmentation of audiences into “smaller, like-minded subsets of the electorate”, which select media according to already existing beliefs. Here, the media have little more than “reinforcement effects”, no matter if information is presented in a consonant or dissonant way (see also Bennett & Iyengar, 2010; Holbert, Garrett, & Gleason, 2010). In light of this “minimal effects” discussion, we also hope for comparisons between US and European audiences, where we expect differing processes of fragmentation to take place.

There are a number of caveats in our study. Generally, we are aware of the delicateness of a study like ours. Including multiple exposures and various tests of duration into an experimental survey design required making sometimes difficult decisions of downsizing the design on one end rather than on another. Second, we found slightly puzzling differences between over-time effects of opportunity and risk frames on our dependent variable. Intuitively (and based on the literature), we expected the negatively valenced risk frame to be more effective (e.g., Soroka, 2006). This was not the case. Explanations for this phenomenon remain speculative. We assume that individuals exposed to the opportunity frame were somewhat “surprised” by its content, given the overall negative tone towards the European Union and its endeavors in the Netherlands. This surprise might have left participants with a more profound impression of what they had read, while the negative condition involved some kind of a “floor-effect” (see also Boomgaarden, 2007).

Third, given the scarcity of relevant research on the duration of framing effects, we had limited theoretical guidance about how to define the delayed measurement points in our study. Future studies should build on our design, and determine the optimum time lags step-by-step. The optimization of various rates of decay of news framing effects could also eventually leave us with a more substantiated expectation of when a framing effect can be called “lasting”, “transitory” or “fleeting”. Moreover, our interim period was characterized by an extraordinarily small amount of elite information on the frame issue (see also de Vreese, 2004). While this was ideal from a methodological point of view, it rendered our design more artificial than originally intended. This leaves us with the question of how quickly our effects would have dissipated, had we chosen a more omnipresent issue. Gaines et al. (2007, p. 6) discussed the possibility that durability might depend on the actual issue of a frame – and suggested that “one frame’s effects [might] last longer than another’s”.

Survey experiments have created a strong empirical building block for framing effects theory. However, these studies have often assumed a long-term influence of framing by means of a short-term methodology. To create a more holistic approach to the study of news framing, researchers need to go one step further and consider the function of news framing within a dynamic political communication flow. This includes tests for multiple exposures to various frames, as well as the tracing of effects over time. We view our results as one small step in a long line of future studies dealing with these new and exciting dimensions of framing research.

Notes

¹ An earlier version of this chapter was awarded a Top Paper Award at the 2010 conference of the Media Effects Division of the German Communication Association (DGPK).

² “Strength” is defined as depending on the “qualities of frames ... such as the credibility of their source and their relationship to consensus values and prior beliefs” (Chong & Druckman, 2007b, p. 639).

³ When on-line processing occurs, “judgments are formed when the information is encountered”, i.e. when an individual first processes new information (Matthes, 2007, p. 56). This judgment can then be retrieved at a later point in time; a subsequent judgment does thus not depend on a re-evaluation of the stored information (see also Hastie & Parks, 1986).

⁴ We coded ten major print news outlets of the Netherlands for (1) issue, (2) presence of the “economic consequences” frame, and (3) tone. Ultimately, the analysis only included 20 issue-relevant articles published within the data collection period. The economic consequences frame did not feature prominently in the coded articles ($M = .25$, $SD = .35$). Measurement consisted of three items: (1) “Is there a mention of the costs/degree of expense involved?”, (2) “Is there a reference to economic consequences of pursuing or not pursuing a course of action?”, and (3) “Is there a mention of financial losses or gains now or in the future?”. Questions were answered with a yes (1) or a no (0), and the score was built by adding items and dividing by total number of items. Cronbach’s alpha was .745. (see Semetko & Valkenburg, 2000; de Vreese et al., 2001). The tone of the articles was overall more negative than positive ($M = 3.86$, $SD = .37$; tone measured on a 5-point scale from 1 = only positive to 5 = only negative). Krippendorff’s alpha was .66.

⁵ We compared our sample with the official census records of the Netherlands (2009). Results showed high compliance between sample and population on key socio-demographic data.

⁶ Overall t_1 : $t(1322) = .455$, $p > .05$; at t_2 : $F(2,238) = .04$, $p > .05$; t_3 : $F(2,481) = 2.17$, $p > .05$; t_4 : $F(2,317) = 2.07$, $p > .05$; t_5 : $F(2,276) = .276$, $p > .05$.

⁷ We found a significant immediate news framing effect for our two news frames, even though we did not focus on this effect in our analysis. Results showed that participants in the opportunity condition displayed higher levels of support at t_1 ($M=4.27$, $SD = 1.26$) than participants in the risk condition ($M = 3.29$, $SD = 1.22$) ($t(1231) = 13.73$, $p < .001$). We also tested whether each post-test group of participants (t_2 to t_5) displayed analogous results at t_1 . This analysis was performed to guarantee that the results in each time group mirror the results of the overall t_1 group. The analysis showed that the different time subgroups did not deviate substantially from the overall group results. All subgroups show a similar significant t_1 framing effect in the expected direction. Thus, t_2 group: opportunity ($M = 4.35$, $SD = 1.32$), risk ($M = 3.30$, $SD = 1.20$), ($t(234) = 6.61$, $p < .001$) ; t_3 group: opportunity ($M = 4.17$, $SD = 1.25$), risk ($M = 3.27$, $SD = 1.18$), ($t(396) = 7.35$, $p < .001$); t_4 group : opportunity ($M = 4.49$, $SD = 1.27$), risk

($M = 3.27$, $SD = 1.17$), ($t(318) = 8.89$, $p < .001$); $t5$ group : opportunity ($M = 4.09$, $SD = 1.27$), risk ($M = 3.35$, $SD = 1.35$), ($t(277) = 4.62$, $p < .001$)

⁸ Although we employed an experimental design, we included a number of control variables in our analysis. A number of variables were used as *socio-demographic* control variables, namely gender, age, and education ($M = 3.61$, $SD = 1.48$, range = 1-6; participants were asked for their highest completed degree). Extant studies also state that political predispositions, represented by prior attitudes on an issue, play an important role when determining framing effects (e.g., Brewer, 2001; Chong & Druckman, 2007a). To measure *prior attitudes* towards the EU, participants were presented with two scenarios, where opposing opinions were represented by a person “A” and a person “B” (Slothuus, 2008). With each scenario, participants had to indicate, with which person’s opinion they agreed with to a greater extent ($M = 3.27$, $SD = 1.01$) (for scenarios and scaling, see Appendix C).

⁹ The reported regression models used absolute change in support as dependent variable (e.g., Singer & Willett, 2003; Taris, 2000). We also tested our models with opinion at t_n support and relative change in support as dependent variable. The results of these alternative tests did not change our findings substantially.

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