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**Blindfolding the Public:  
Examining the Hydraulic Pattern Hypothesis of Media Priming Effects**

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**Blindfolding the Public:  
Examining the Hydraulic Pattern Hypothesis of Media Priming Effects**

**by**

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**Dissertation**

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## **Dedication**

To my wife Kyeong-hwa Choi.

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**Blindfolding the Public:  
Examining the Hydraulic Pattern Hypothesis of Media Priming Effects**

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The University of Texas at Austin, 2014

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In this dissertation was examined the hydraulic pattern of media-priming effects by looking into Granger causality (a statistical test to determine if one time series is useful in forecasting another) between media coverage and the importance of issues people perceive. The hydraulic pattern hypothesis, an argument that increase in the importance of an issue is accompanied by decrease in a similar amount of importance, is embedded in most media-effect theories but has rarely been tested. To test the causality with media coverage, time series of six issues and six candidate variables were created. This research is distinct from previous studies of priming in that it tests aggregate-level influence of media coverage on popular evaluation of political-campaign candidate in a long-term setting.

In the findings, media coverage of issues induced changes in the Granger-caused issue-weight of the issue that it covered, confirming the main effects of priming. The hydraulic pattern was also confirmed. Active media coverage of an issue, induced Granger-caused changes in five other issue-weights. It was found that it takes 7–8 days after the media coverage to establish a causal relationship of priming effects.

In another finding, the result showed that the time-lag of the hydraulic pattern preceded the main priming effects. As regards the debated relationship of priming effects with political knowledge, this research found that high knowledge groups are more susceptible to the main priming effects. However, the impact of political knowledge on the hydraulic pattern was the opposite. This means that less knowledgeable people may be more vulnerable; that is, they are more likely to lose sight of other issues when the media primes a certain issue.

In the test of attribute priming, the causality of the hydraulic pattern was also established to a lesser degree. Especially, personality-related candidate attributes like trustworthiness were robust regarding the hydraulic-pattern effects.

In all of these analyses, the measurement of optimal time-lag was utilized instead of the durability concept used in previous studies. With this study design and new measurements, this research contributes to the literature by providing new insight into the theoretical conundrums related to priming theory. One of such insight is that the priming effects that matter at the poll, are relatively slow and deliberative processes, and are differentiated from the temperamental daily effects of news.

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## **Chapter 1: Introduction**

Every media-effect theory assumes that when the media focus on an issue, other issues become less salient and less important. This belief is one of the bases of the priming theory, a cognitive explanation of media influence on popular evaluation of presidential or other political candidates (Iyengar & Kinder, 1987). The theory posits that by emphasizing a certain issue and ignoring others, the media increases the importance of one standard over others. According to the literature, one nature of the priming effect is the hydraulic pattern. This is an inverse relationship by which the increase in importance of a certain factor in our mind, is accompanied by a decrease in the importance of other factors to a similar degree (Lee & Shah, 2008; Marquis, 2007; Miller & Krosnick, 2000; Pan & Kosicki, 1996; Iyengar & Kinder, 1987).

As the term implies, the hydraulic-pattern argument is built on the notion that the cognitive capacity of a person is like fluid in a closed solid container; such that when fluid is poured into it, the same amount has to be poured out of it (Norman & Bobrow, 1975). The process of the hydraulic pattern is automatic. Other information is pushed aside in our mind without our awareness of it, when some new information moves to the focal position in our mind (Taylor & Fiske, 1978). Theories of media have accepted this argument from an early stage. Lippmann (1922) described how the media shows the world like “the beam of a search light that moves restlessly about, bringing one episode and then another out of darkness into vision” (p. 229). This metaphor means that once the

beam passes, the public forgets about issues no longer highlighted. In other words, when issues are out of sight, they are “out of mind” (Lipmann, 1922, p. 29).

The purpose of this dissertation is to explicate a behavioral pattern when the public is primed away from an issue. The effort starts with a number of questions. First is the causality of the effects. When the media covers a certain issue, does it change the importance of other issues? As with other media effects, the hydraulic pattern of priming effects will depend on a number of conditions. If so, when does the hydraulic pattern show and when it does not? Third, if the hydraulic pattern effects indicate the media influence on other issues, how are they related with the main effects of priming, that is, the influence on the issues that the media covers?

In investigating the causality between media coverage and the importance of perceived issues, this dissertation employs a scheme that captures an aggregate-level relationship, and incorporates a daily cycle of new coverage intensity. Researchers have argued that the strength of the priming theory is that it captures the media influence at the individual level (see Kinder & Krosnick, 1990, pp. 497–499). For example, previous studies have posited that the framework of priming research explains the psychological mechanism of media effects, and how individuals react differently to media. Therefore, the designs of previous studies were focused on turning aggregate-level influence into individual-level outcomes.

In this dissertation, I argue that to establish the causality of the hydraulic pattern of priming effects, aggregate-level analysis is necessary. With all the merits of individual-level variables, direct causality will be better established with the same level

of analysis as the media coverage. Also, aggregate-level analysis allows for a longer trend of effects, and this is particularly useful in capturing dynamic relationships such as those during political campaigns.

For that purpose, in this dissertation, I created an aggregate-level time-series variable of issue-weight that corresponds to the news-coverage variable created by content analysis. Using National Rolling Cross-Section (RCS) data of the National Annenberg Election Survey (NAES) 2008, these measurements were calculated by running an OLS regression model on candidate-approval for each day from May 3 to November 3, 2008. Weight variables were created for six issues and six attributes that are distinguishable from each other. Vector auto-regression (VAR) methodology is used to evaluate whether the media coverage on an issue, Granger causes (Granger, 1969) a change in the importance of the issue (main priming effect), and/or the importance of other issues (hydraulic pattern).

As for the question of when the hydraulic pattern shows, two conditions: the impact of time and political knowledge, are tested in the present research. Priming is time-bound (Arendt, 2013b; Kim 2006). In an experimental laboratory, the media priming effects immediately fade away, but in political settings, they may last over weeks (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009), for the effects are constantly facilitated as the media coverage is repeated every day. To capture the dynamic aspects of time in priming, this dissertation uses the variable ‘optimal time-lag’ as the measure of time span between the media coverage and priming effects. Optimal time-lag is the number of lags that adequately models the causality between two time series variables.



By using a scheme that investigates a direct causality with new measures, this dissertation intends to produce a more vivid insight into the nature of the priming effect. Beyond the methodological contributions, I believe this dissertation will contribute to clarifying the very nature of priming effects. Soon after the priming theory was introduced to the study of media effects (Iyengar and Kinder, 1987), it was debated if these effects were the same ones that were tested in psychology laboratories. Inconsistent results about durability and susceptibility, especially in the survey studies, led many scholars in both psychology and political communication to believe that they are in fact testing two different phenomena (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009).

Followers of one school of thought believe the media-priming effects are the same as the effects of accessibility observed in psychological experiments, of which the latter effects were unconscious, automatic, unreflective and fast. The hydraulic pattern is related to this perspective. The other school thinks media effects are of conscious, intentional and deliberative nature, often slow to appear and fade. Many scholars of the agenda-setting theory (Buklow, Urban, & Schweiger, 2013; Takeshita, 2006) are in support of this position. The latter school argues that media priming is based on the mechanisms of learning effects (Lenz, 2009; Wanta, 1997), applicability and/or chronic accessibility (Althaus & Kim, 2006; Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009). The distinction is important normatively, for the accessibility explanation views the audience as passive objects while the latter views them as more active and goal oriented.

The impact of political knowledge on both the priming and the hydraulic pattern of priming effects are tested in line with this perspective. Since time span has been proposed as the reason for the mixed results concerning the impact of political knowledge, an examination under the condition of optimal time-lag is expected to contribute to clarifying the debated relationship. Based on observations in the literature, I hypothesize that the impact of political knowledge is different for the main, and the hydraulic pattern of, priming effects. I extend the argument to suggest that the hydraulic pattern is a different effect from the long-term priming process observed in political campaigns.

Realistically, the hydraulic pattern of media influence is the subject that begs the academic research. Candidates, political parties and presidents strategically and tactically create certain issues to divert attention from others. Previous studies show that parties try to increase the salience of issues they own and decrease others in the media (Petrocik, 1996). If priming of one issue automatically accompanies the decrease of importance of other issues that are relevant, it means the media is capable of blindfolding the public. It is true that often what is omitted in the campaign is as important as what is covered, and “the effects of the campaign are less in saying what is on the agenda than in saying what is off it” (Just, 1996, p. 55).

However, the argument presented in this dissertation is that media priming is the effect that is distinguished from relatively ephemeral change of attention. People may talk about Obamacare one day and focus on Ukraine the next. What matters at the poll is not the daily flux of items that attract attention then are quickly forgotten, but more

lasting change to the evaluation system in our minds. In this dissertation, I propose and support the notion that there are two separate kinds of priming effects distinguished by their relationship with time. Here, I also, examine whether differences in political knowledge entail unequal consequences from the blindfolding effects of media priming.

## Chapter 2: Literature Review

### OVERVIEW OF THE HYDRAULIC PATTERN HYPOTHESIS

Early architects of the media priming theory portrayed the public as passive consumers of news victimized by the redoubtable power of the mass media (Iyengar & Kinder, 1987; Krosnick & Brannon, 1993; Krosnick & Kinder, 1990). They argued that the media have the capacity to manipulate voters, to make decisions they would not have made if they had made a conscious choice. Krosnick and Kinder (1990), who studied the priming effects of Iran-Contra gate coverage, described the consequence as people being “swept away by [an] avalanche of stories and pictures” (p. 508). Strictly speaking, media priming is a process where news coverage influences people to perceive certain issues as more important than before. However, when researchers describe the concepts, they go beyond the narrow connotation of priming, arguing that when some issues loom larger due to media influence, the public loses sight of other issues they should attend to.

Theoretical definitions of priming stated in the literature maintains that it works in two directions simultaneously. First, the increase of popular perception of the importance of an issue is accompanied by the decrease of perceived importance of other issues. Second, the definition of priming effects presented in Iyengar and Kinder’s study (1987), which introduced priming theory to political communication, is often cited: “by calling attention to some matters *while ignoring others*, [political news] influences the standards by which governments, presidents, and candidates for public office are judged” (p. 63, emphasis added). More recent studies of priming follow the same definition with clearer

statements: “The media are responsible for priming, when they create, strengthen or *eliminate* standards of political judgment by calling attention to some issues” (Togeby, 2007, p. 345, emphasis added). Thus, the current definition of priming implies that by telling the people what to think about, the media also tell the people what *not* to think about. As a result of this ability of the media to influence the public in both ways, their impact on the political system is strong, and influence on democracy can be negative, for it implies that the media can turn away the public from issues it should care about.

The gap in the literature of priming is that while the theoretical definition describes influence as happening in two ways, the study designs, research hypotheses and tests are focused on only in the direction of the main effects of priming. That is, the conceptual framework is that the media influence the importance of issues that they cover, along with other issues that are on the minds of the people. Yet, the empirical examination in most studies is only aimed at the influence of the issues covered by the media. The term used in the literature to describe the influence of the media on other issues is the hydraulic pattern (i.e., that the increase of perceived importance is accompanied by a similar degree of decrease in the media-priming process).

In this dissertation, I review the assumptions in the literature that support the claim, and assess how they are connected to the debate about the susceptibility and underlying mechanisms of priming effects in political campaigns. Prior to this assessment, the origin of the term and review how the hydraulic-pattern hypothesis is accepted in other theories of media effects such as agenda setting and framing.

The term ‘hydraulic pattern’ was imported to this discipline from psychology with the theory of priming itself. Its usage in psychology dates back to Sigmund Freud, who used phrases like hydraulic pressure, equilibrium and relief of forces as metaphors in his theories (Leary, 1994). For example, Freud’s theory of emotions argues there are two kinds of human behavior, purposive and hydraulically directed. Hydraulically directed behaviors are unconscious reliefs such as dreams and displacement of the pressure built up by the motivational end. From its start as a metaphor, the hydraulic relationship is now broadly used to indicate a near-perfect negative correlation between empirical research variables in psychology (Bassili & Racine, 1990; Miller, Smith, & Uleman, 1981). Although consensus on a rigorous definition is yet to be reached, scholars attempt to use the term in a restrictive manner. Taylor and Koivumaki (1976) argued the term should indicate an inverse relationship between elements yoked together so that increments of one are accompanied by decrements in the other. In a study of the relationship between government instability and belief in religious sources, Kay and colleagues (2010) defined hydraulic relations as functionally-related cases of negative correlation, in which situational constraints that suppressed one variable would produce an increase in other variables. They described the connotation of the term as follows:

“consider the relation between wearing warm clothes in one’s house and the temperature at which one chooses to set the furnace. If all other variables are kept constant and we look within a single moment in time, we would expect these two behaviors to exhibit a *hydraulic relation*, because they both serve the same function—warmth. The hotter the

temperature at which one sets the furnace, the less need there is to warm oneself with clothes and vice versa” ( p. 729, emphasis added).

The hydraulic pattern is not a unique phenomenon of priming effects and is used in other theoretical traditions of media-effect studies. Those in framing research, also imported from psychology, have used the term to indicate that when media emphasize a certain interpretation of an issue, others will be deemed less significant (e.g., Lee, McLeod, & Shah, 2008; Price, Tewksbury, & Powers, 1997).

Supporters of the agenda-setting theory of media, which was introduced more than a decade earlier than priming, have also argued that the increase of salience of a particular issue will entail the decrease of the salience of other issues. Although not explicitly stated, the idea of hydraulic pattern has been embedded in the early, classic agenda-setting research by the practice of using rank-order correlation to gauge media influence on the public agenda (McCombs & Shaw, 1972; Funkhouser, 1973). Notably, the founders of agenda-setting theory described the hydraulic pattern of effects as a virtuous process that media brought about, and argued that it will contribute to democracy by building a foundation for consensus within the society or community (McCombs, 2004). McCombs and colleagues (1997) stated:

By emphasizing a relatively small number of issues at a time, the mass media focus public attention on these issues. In doing so, the media set the themes of public opinion for us. Put another way, people *agree* on what to think and talk about. This represents the initial stage of public opinion formation (McCombs, Shaw, & Weaver, 1997, p. xii).

Also noteworthy is that a number of studies of agenda setting directly tested the hydraulic pattern, that is, how the increase in salience of one issue affects the salience of other issues (McCombs. & Zhu, 1995; Rogers, Dearing, & Bregman, 1993; Zhu, 1992). The phenomenon named the “zero-sum principle of agenda-setting” (Zhu, 1992) applied if the addition of new issues to the public agenda by the media, occurred at cost to other issues. The results reported were in support of the principle as a general rule.

Unexpectedly, some issues strengthened their salience when a new agenda was introduced by media. It is presumed that in the agenda-setting framework, issues compete for public attention and the winner gets a higher rank, while others are pushed down on the public agenda (Chong & Druckman, 2009; McCombs, 2004). As it turned out, some issues; like cancer, AIDS, and sexually transmitted diseases, are grouped in partnership rather than in competition. Zhu (1992) indicated that in agenda setting, as in biological symbiosis, some issues mutually reinforce each other.

#### **ASSUMPTIONS AND LIMITATIONS**

The argument that the hydraulic pattern is fundamental in priming studies is based on assumptions about the behavior of people in regards to politics. First, the cognitive capability of a person is limited so that they constantly face the problem of information overload regarding public affairs. Because people have neither the ability nor the motivation to comprehensively incorporate all the relevant issues, the cognitive system handles information overload with two strategies; by stopping the intake of new information and continuing current tasks, or, by continuing to receive new information



while degrading current performance (Norman & Bobrow, 1975). The latter strategy is the basis of the hydraulic-pattern hypothesis of priming effects. To be a cognitive miser and news consumer at the same time, people have to constantly put aside issues that are less relevant (Miller and Krosnick, 1996).

The second assumption is that the priming process is unconscious and automatic. As with a mindless machine, when media prime an issue, it moves to the top of the focal list in the mind, and the others remain below (Fazio & Williams, 1986; Krosnick, 1989). In this process, the public is passive. The top of the mind phenomena approach (Taylor & Fiske, 1978) presumes that there is no conscious effort to increase capacity to hold new knowledge, and that the decrement of information happens automatically. Thus, the influence of media on the public is assumed to be so far reaching that it can blindfold the public from a certain issue without their knowing.

With these assumptions as pillars, the hydraulic-pattern hypothesis is embedded in priming research. Although circumstantial evidence in previous studies indicate that there are many exceptions to this rule, in some cases, the hydraulic-pattern hypothesis holds. For example, in one study (Druckman & Holmes, 2004), when President Bush highlighted the War on Terror in the 2002 State of Union address, the importance of education as a criterion for approval of the president decreased significantly. Thus, the audience was “primed away from non-emphasized criteria” (Druckman & Holmes, 2004, p. 767). Pan and Kosicki (1997) found a clear case of a hydraulic pattern over a longer term. Using three-wave panel-analysis of data from 1990, 1991, and 1992; and utilizing z-statistics to compare the regression coefficients on the presidential approval rating, the

results from their study indicated that a significant increase in the importance of economic issues was accompanied by a significant decrease in the importance of foreign affairs and handling of the Gulf War.

Given that the nature of the priming effects is clarified and that the two ways the effects work is specified, the first hypothesis of this dissertation examines the main effect of priming:

**H1:** When the media covers a certain issue, the weight (importance) of that issue for popular evaluation of political candidates will change. (Main priming)

The second hypothesis of this dissertation examines the hydraulic pattern of priming separately:

**H2:** When the media covers a certain issue, the weight (importance) of the other issues used for popular evaluation of political candidates will change. (Hydraulic)

It should be noted that anomaly about the hydraulic pattern is frequently found in the literature. In Krosnick and Kinder's study of the Iran-Contra scandal (1990, pp. 505-506), the importance of economic issues remained unchanged even after the media preoccupation with the scandal. The importance of the aid-to-Blacks issue has become non-existent, a drop from 0.22 to 0.00 as measured by unstandardized OLS regression coefficients. The increase of the impact of the Central-America issue went from 0.18 to 0.29. Analyzing Gulf War data, Kim (2005) found that the importance of diplomacy increased, when evaluating the president, as intensive coverage of the war increased the importance of the capacity to conduct war.

When does the hydraulic pattern work and when does it not? To answer this question, I looked further into the literature about the mechanism that underlies the priming effect.

## **TWO KINDS OF PRIMING**

### **Accessibility, applicability and learning**

The mechanism underlying the priming process has been explained in different ways for some time. In the literature, there are four explanations to date: temporal accessibility, chronic accessibility, applicability and learning. Each explanation leads to different predictions about the conditions and susceptibility of priming effects, and of the hydraulic pattern.

In the initial theoretical framework, researchers of media-priming effects accepted the theoretical construct of accessibility provided by cognitive psychology. Here, the priming process is described as an activation of knowledge for making judgments. Accessibility is the potential for certain knowledge to be activated over other knowledge (Higgins, 1996). By receiving information, people develop memory traces (Tulving & Watkins, 1975) or activation tags (Collins & Loftus, 1975) in their minds. Media priming studies in the early stage (Iyengar & Kinder, 1987; Krosnick & Kinder, 1990) took this position and suggested that people relied on information that is most accessible in memory, which in turn is determined by which stories media choose to cover. They accepted the experimental findings of psychology that recently and frequently developed tags come to mind more easily. Because of this nature, accessibility effects are

considered to be short-lived, unconscious and automatic. Also, accessibility effects are considered to show hydraulic patterns. Coupled with the notion of heuristic information processing (Tversky & Kahneman, 1973), the accessibility explanation contends that when recent information is retrieved from the top of the mind, other information is pushed down. Eventually, the media cue the public to make older issues unimportant.

The accessibility explanation failed to account for political phenomena outside experimental labs. Especially, the durability or time-lags of priming effects observed in political settings, such as campaigns, were much longer than the predictions accessibility theory provided. Thus, the concept of chronic accessibility was used to account for effects when an issue is covered by media repeatedly and intensively (Roskos-Ewoldsen et al., 2009). Thus, temporal-accessibility develops into chronic-accessibility which then exhibits a less susceptible, more durable cognitive evaluation system.

Theories of psychology provided another theoretical construct, applicability, which is qualitatively different from accessibility. While the accessibility explanation concentrated on the frequency and recency of the media message, applicability takes its content into account. Applicability is a match between the media message and the stored knowledge of individuals, and even if accessibility diminishes with decay, applicability activates knowledge for a judgmental task (Higgins, 1996). In studies of political communication, scholars indicated that applicability is related to a judgment of the relevance of information to the current situation, therefore more deliberative than applicability (Miller & Krosnick, 2000; Price & Tewksbury, 1997). However, differentiation of the two is not easy. Some scholars argue that accessibility and

applicability effects are interdependent, so that the two may occur as a continuous process (Althaus & Kim, 2006).

The fourth explanation sees media priming as a learning process (Lenz, 2009). The differentiation between learning and accessibility/applicability is that the former is an intentional process. It is not an unconscious process within a fixed cognitive system. People learn about the issue from media, compare it with personal interest and increase its importance when making political judgments. Using a survey approach, Briars and Wattenberg (1996) found that people who learn about the positions of a candidate on issues are likely to remember the information and to use it to evaluate the candidates. Also, using a number of secondary-survey data sets, Lenz (2009) found that the media-priming effects happened only when people learned about the stance of a candidate regarding the primed issue. An advancement from this study was the idea of a ceiling-effect of priming, that is, that effects were not found among those who already knew about the positions of candidates on the issue.

Some scholars of the agenda-setting tradition accepted the social-learning thesis of psychology and strongly argued against the accessibility/applicability explanation of media effects (Takeshita, 2006; Wanta, 1997). First, it was felt, people learn how concerned they should be from the amount of coverage an issue receives. Wanta (1997) indicated that this was not an idea initially proposed for agenda-setting. Shaw and McCombs (1977) originally described agenda-setting as an unintentional byproduct of media exposure, which implied an incidental learning process rather than an active cognitive process. However, what Wanta describes is a multi-stage of process in which

salience of issues leads to a cognitive judgment about the importance of issues. Specifications about each steps of procedure is still obscure in the literature. Priming effects are argued as the outcome of agenda setting effects (McCombs, 2004). All in all, the implication of the learning thesis is that the priming process should take a while, relatively longer than the accessibility explanation of cognitive psychology.

### **The dual process**

As results accumulated from studies of media priming, some scholars suspected that the media-priming effects found in political communication studies were not the effects that the psychology scholars originally tested in the experimental laboratory (Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009). One ramification of such arguments is that previous studies have dealt with two distinct effects as if they are one, and that there exist two kinds of media effects that cancel each other when using aggregate data (Takeshita, 2007).

The other view is that the two kinds of priming develop in a linear process. Various approaches based on chronic accessibility and applicability, predicted that different effects could coexist or transform from one to another. For example, in a re-analysis of priming effects of the 1991 Gulf War, Althaus and Kim (2006) explain:

...priming effects are produced in two ways: recent primes can temporarily increase the accessibility of a construct, and frequent primes can gradually increase the applicability of a construct in ways that make the construct chronically accessible long after exposure to the stimulus

(e.g., Price and Tewksbury 1997). Only the first mechanism has been directly tested in news priming studies, and these studies have tended to capture the effects of priming at only one point in time (pp. 962-963, emphasis added).

Further influenced by the dual-processing theory of neuro-science (Damasio, 1999; Gazzaniga, 2005), some scholars argued for a linear path of media influence, in which, as the interaction with the media is repeated, the effect develops into a mechanism that involves additional cognitive processes after starting out as an automatic and unconscious process (Bulkow, Urban, & Schweiger, 2012).

Although they were tagged differently, the dual structure of priming has been argued in a number of studies. Roskos-Ewoldsen and colleagues (2009) suggested:

It is perhaps unfortunate that the cognitive/social priming research is cited as support in the political realm, because the phenomenon does not fit the characteristic of priming. It is more likely that the frequent and repeated stories on a particular issue (e.g. the Gulf War) increases the chronic accessibility of the information. Rather than calling this phenomenon political priming, it would be better if we referred to it as *political cultivation* (Roskos-Ewoldsen et al., 2009, p. 83, emphasis added).

In another case, Kim (2006) argued that people make logical connections between issues when evaluating the president. For example, diplomacy increases weight in a regression on the support of the president when the media flood information channels

with news of the war. Kim called this type “active priming”, and distinguished it from “passive priming” (p. 752).

Literature on agenda-setting contains two distinct kinds of media effects that provide a more vivid description. For example, Takeshita (2006) asserts that there are “pseudo” and “genuine” agenda-setting effects. For genuine agenda-setting, the knowledgeable are more susceptible to media effects. Citing the findings of Wanta (1997) that agenda-setting effects are the result of a social learning process, Takeshita argues that people will eventually be influenced by deliberative-type agenda-setting effects. However, because it coexists with, or is preceded by, pseudo effects, research has produced mixed results. For example, genuine and pseudo effects cancel each other to produce null effects. Takeshita maintains that what seems to be a null impact of political knowledge on agenda setting is because the direction of the genuine impact is the opposite to the direction of pseudo impact.

These findings are not cumulative. That is, the dual structures and paths described in previous studies are not on the same track. Many scholars commonly point to a path, as Althaus and Kim (2006) did, that temporal accessibility develops into chronic accessibility and applicability. However, scholars like Price and Tewksbury (1997) argue that applicability is a unique mechanism of framing, while priming and agenda-setting effects, are fully explained by accessibility. On the other hand, Bulkow and colleagues (2013) found that priming effects will move from automatic to deliberative stage, depending on personal issue-involvement, a variable related to applicability. If issue-involvement is low, people tend to process information peripherally (Petty & Cacioppo,

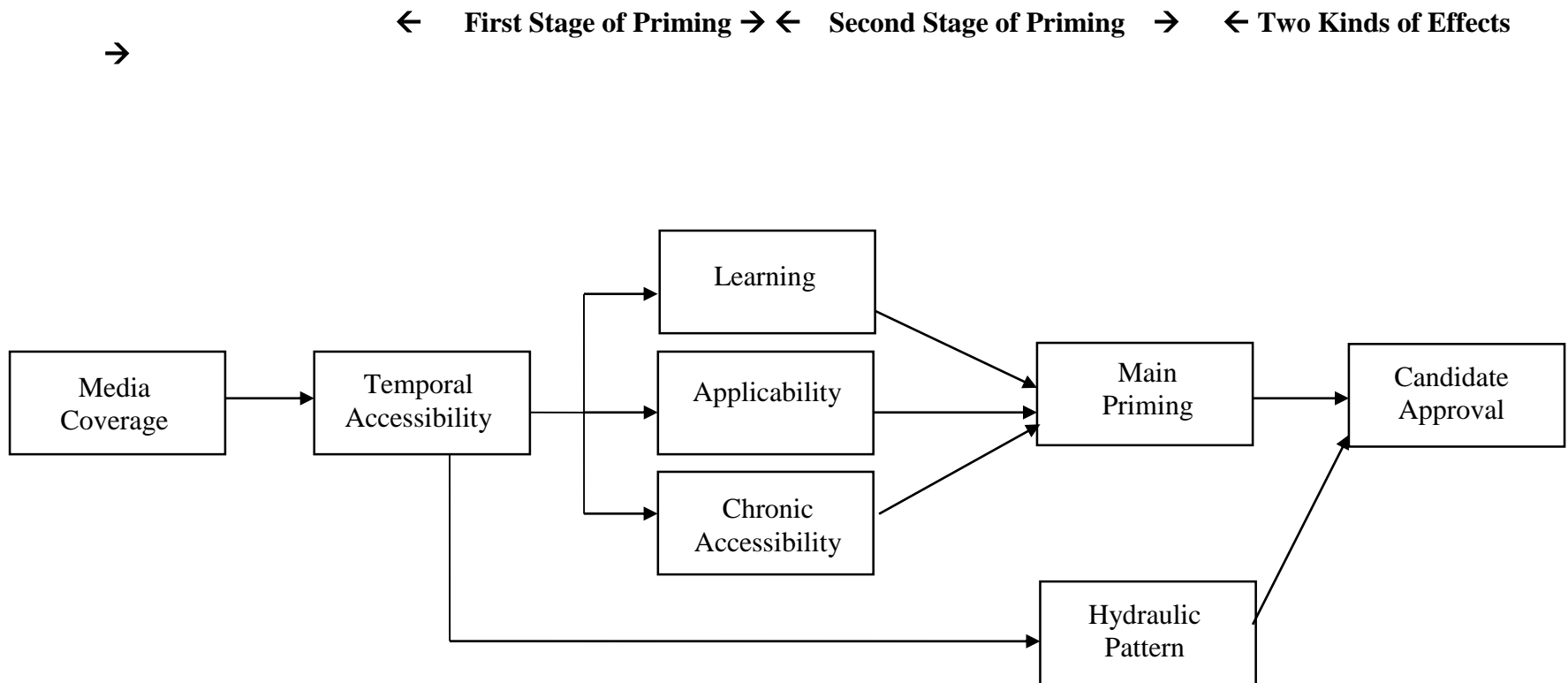


1986) or heuristically (Chaiken, Liberman, & Eagly, 1989). When issue-involvement is increased, the priming process will develop into a deliberative phase.

Yet, taking a common denominator of the arguments and findings in the literature, one can argue that one class of effects may be described as unconscious, automatic, unreflective, fast and effortless; while another class might be described as conscious, deliberative, reflective, slow and intentional (Buklow, Urban, & Shweiger, 2013; Takeshita, 2006). That is, the argument of a dual process of priming is that conscious thinking follows unconscious information processing. The underlying mechanism of such a process is that the automatic type of priming is driven by accessibility, temporal or chronic, and that the deliberative type is explained by either applicability or chronic accessibility (Althaus & Kim, 2006; Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2009) or by learning (Lenz, 2009; Wanta, 1997).

As we return to the assumptions of the hydraulic process, it is argued that the top of the mind phenomenon that drives the hydraulic pattern in priming is driven by accessibility. The decrement of information in a person's evaluation system does not occur by conscious judgment but happens automatically. For the dual process of priming, this dissertation presents the argument that the hydraulic pattern of effects is related to the first stage, and that the main priming effects will become evident after the second stage. The new theoretical model presented here, that incorporates temporal accessibility, chronic accessibility, applicability and learning, is shown in Figure 2.1.

Figure 2.1 Theoretical Model of the Dual Process of Media Priming Effects



## **TIME AND THE HYDRAULIC PATTERN**

In answering the initial question about when the hydraulic pattern of priming effects show and when it does not, the key is to identify the dual process of effects. Since the hydraulic pattern is related to the first stage of priming, it could also be argued that the hydraulic pattern of effects is an indicator of an automatic phase of priming. Thus, the hypotheses of this dissertation was developed with a view to identifying the dual process of priming. Along with the hydraulic pattern, evidence in previous studies point to two more indicators of the dual process of priming: time and political knowledge. A comprehensive comparison of the dual stage of priming is presented in Table 2.1.

Unlike for the hydraulic pattern, a substantial amount of the literature has been focused on the impact of time and political knowledge on priming effects. Yet I believe there are gaps in the literature that call for a new approach. In the following sections, I will review the literature on each indicator and attempt to suggest an improved way of examining them.

First, since it is assumed that the dual process proceeds in a linear manner, the time span of the effects will be shorter for the first stage than for the second stage. In the context of political campaigns, where people are exposed to media coverage about multiple issues continuously, it could be hypothesized that the first stage of priming will manifest first, then develop into the next stage. Roskos-Ewoldsen and colleagues (2009) posited that the critical point that sets apart political priming from cognitive priming is time, and suggested that models of media priming should include time as a key variable.

Table 2.1 Comparison of the Two Kinds of Priming in the Dual Process

Priming effects	First stage	Second stage
Mechanism	Temporal accessibility Chronic Accessibility	Chronic accessibility Applicability Learning
Description	Unconscious Automatic Unreflective Fast Effortless	Conscious Intentional Deliberative Slow Effortful
Names in the literature	Cognitive priming	Political cultivation (Roskow-Ewoldsen, 2009)
	Pseudo effects	Genuine effects (Takeshita, 2006)
	Passive priming	Active priming (Kim, 2005)
Time (duration)	30 minutes to several days	Several days to two months
Impact of knowledge	Negative or null	Positive and significant
Hydraulic pattern	Strong	Weak

Priming effects appear and fade away, so the result of research will depend on when you measure them. Researchers who examined the impact of time on priming focused on the duration (decay) of effects. A number of experimental studies have found that media priming effects decay quickly. Carpenter and colleagues (2008) tested the decay of media priming immediately after and again after twenty minutes delay, and found that the effects faded within twenty minutes. Kim (2006) found that priming effects faded within 24 hours. In a more extended study, Ardent tested a  $2 \times 4$  design (3 or 16 minutes, one or two days) and found that the effects decayed exponentially but that vigilance extended the decay.

Despite their contributions, these experimental studies are vulnerable regarding their external validity. The first limitation is that the time-span tested in the laboratory

does not cover the full length of duration in realistic political settings. In a meta-analysis that included survey studies, Roskos-Ewoldsen (2009) concluded that media priming effects in the political realm lasted from weeks, up to two months. However, previous experimental studies examined durability over periods from hours to a few days, and concluded that they fade out. This means that it is probable that the durability studied in previous experimental studies was confined to the first stage of the dual process.

In addition, durability is not the only dimension of time variable that influences. Regarding the impact of time on priming, there is a dimension of *delay* as well as *duration*. Some studies have suggested that time influences priming in terms of susceptibility, that is, it matters when the effect *appears*. In political campaigns, people are exposed to news repeatedly over a lengthy time span. Over the course of campaigns, priming effects appear and fade as voters select their preferences (Traugott & Lavrakas, 2000; Berelson, Lazarsfeld, & McPhee, 1954). Researchers have pointed out that there is a lag between media coverage and the priming effects, so that mixed results about the susceptibility of priming effects may be due to the time after the coverage (Chong & Druckman, 2010; Togeby, 2007; Druckman & Holmes, 2004; Krosnick & Brannon, 1993). If the effects of political priming convert from temporal-accessibility effects to chronic-accessibility, applicability and learning, it is likely that such conversion happens earlier for people who are more knowledgeable and more engaged. As a general rule, greater knowledge constitutes a greater ability to encode, store and retrieve information (Krosnick & Brannon, 1993).

Given that priming is a dual process, I propose that the measurement of time should cover a span long enough to capture not only the short-term effects, which could last less than 24 hours, but also the long-term effects. In a long political campaign process, where different issues are covered dynamically, short-term priming effects on issue importance are bound to fade away, and the long-term effects survive. Also the measurement should tap the delay of effects as well as their duration.

Thus, in this dissertation is proposed the concept of optimal time-lag as a comprehensive measurement of time that captures the point where a causal relationship between media coverage and priming effects can best be established. In time-series analysis, where the stimuli are repeated and the effects fade away constantly, a time-lag is selected theoretically and statistically by which time-series variable can predict other time series (Stock & Watson, 2003). For example, in the examination of the influence of media coverage on the public perception of specific issues, the result of time-series analysis depends on the selection of a time point at which such relationships are significant (Rogers, Dearing, & Chang, 1991; Liu, Lindquist, & Vedlitz, 2011). To test the impact of time in a realistic setting of a political campaign, in this work the optimal time-lag will be used, rather than a dimension of durability as in previous studies.

In designing a study to examine hydraulic effects, it is of central importance to determine the influence of time. Considering the argument for the dual process of priming, it could be expected that the optimal time-lags of the main priming effects and the hydraulic pattern are different. However, since the literature only examined the

durability dimension of time, the following research questions are presented in this dissertation:

**RQ1:** What is the optimal time-lag of the priming effect in a political campaign?

**RQ2:** What is the optimal lag of the hydraulic priming effect in a political campaign? How is it different from the main priming effect?

#### **ATTRIBUTES AND HYDRAULIC PATTERN**

Scholars seeking a linkage between second-level agenda setting and priming, have advanced a notion of attribute priming which hypothesizes that attributes of a candidate emphasized in the media will become significant dimensions of evaluation by the public (Ha, 2011; Kim, Scheufele, & Shanahan, 2002). Arguing that attribute priming is the outcome of attribute-agenda setting, these studies have found evidence that media influence the importance of particular attributes among the public by placing emphasis by their coverage. Unlike other lines of the tradition of agenda setting; however, attribute priming is not supported by cumulative findings about the conditions of the effects. For example, there is little information about whether there was competition among attributes in other studies, as with competition among issues, in the process. This study includes application of the hydraulic-pattern hypothesis of issues to candidate attributes, to test if priming of a certain attribute will influence the importance of other attributes in political campaigns.

Despite the scarcity of the literature, previous studies on leadership traits, candidate image and framing imply that, as with issues, competition among attributes exists and that the hydraulic pattern may also show in attribute priming. At the same time, it could also be expected that the strength of effects would be different from those from issue priming.

Research on presidential campaigns and presidential leadership, indicates that traits of the president considered by the public for evaluation are in a competitive relationship with each other (Bishin, Stevens, & Wilson, 2006; Funk, 1996; Goren, 2006). Framing studies also indicate that media emphasize certain attributes while decreasing the importance of others (Price, Tewksbury, & Powers, 1997). Interestingly, a study of framing found that the media influence not only decreases, but also increases the importance of other attributes (Lee, McLeod, & Shah, 2008). When a news story emphasized partisanship, the importance of other attributes was diminished. In contrast, when partisanship was ignored, individuals were likely to apply other relevant attributes. In other words, hydraulic patterns were found in both negative and positive directions.

There is evidence, however, that the attitude of the public about the attributes of the president is more general, rather than specific. The various attributes of political figures mentioned in the news can be lumped into a few larger categories. Kinder and colleagues (1980) argued that there are two prominent attributes by which presidents are judged: competence and trustworthiness. They were called the two attributes of the presidential prototype. Similarly, other scholars suggested that attributes mentioned in campaigns can be categorized into the typology of performance and character



(personality), and argued that media are primarily concerned with personality (Page, 1978).

Studies found a strong impact of media on the perceived importance of these traits (Stevens & Karp, 2012). Some results suggest that the hydraulic pattern of effects shows in attribute priming as it does with issue priming. For example, negative influence on the attribute of trustworthiness can easily diminish perception regarding the attribute of competence (Stoker 1993). In other cases, the existing evaluation system of attributes, in the minds of the people, can largely be changed in the course of political campaigns. As with issues, the Hayes' theory of trait ownership (2005) suggests that voters see Republicans as stronger on leadership and moral issues, and Democrats as more compassionate and empathetic. Yet, findings suggests these traits are easily trespassed in political campaigns (Balmas & Sheafer, 2010).

Thus, the following hypotheses are proposed about the main effects, the hydraulic pattern and time-lag of attribute priming:

**H3:** When the media covers a certain attribute, the weight (importance) of that attribute for popular evaluation of political candidates will change. (Main priming)

**H4:** When the media covers a certain attribute, the weight (importance) of the other attributes used for popular evaluation of political candidates will change. (Hydraulic)

**RQ3:** What is the optimal lag of the attribute main-priming effects in a political campaign?

**RQ4:** What is the optimal lag of the attribute-hydraulic-priming effects in a political campaign? How is it different from the main priming effects?

For attribute priming, findings in the previous study showed that there were close connections among related attributes. As attributes are largely categorized into two groups (performance and character), it is plausible that attributes within the category share similar characteristic. For example, the performance-category attribute and the personality-category attribute may demonstrate different degrees of susceptibility to media influence. Or, the hydraulic pattern may be more likely to occur across a category than within the same category variables. For example, if the experience (performance) attribute is primed, it may be that the weight of trustworthiness (personality) is more susceptible to change than attributes categorized as related to performance. Thus, this dissertation investigates the following research question:

**RQ5:** How do the larger categories of performance and personality influence the main, and the hydraulic, pattern of attribute priming?

#### **MODERATION OF POLITICAL KNOWLEDGE**

In this dissertation, I argue that political knowledge is a key indicator of the dual process of priming. General political knowledge has been found to be highly correlated with both cognitive ability and political engagement (Delli Carpini & Keeter, 1996). Therefore, within the theoretical framework of this dissertation, political knowledge is

expected to interact positively with the deliberative stage of the priming effect. Also, because the first stage of priming is automatic and unreflective, the impact of knowledge would be null or negative.

The impact of political knowledge has been the focus of investigation before, and influenced by the findings of cognitive psychology, previous researchers of political priming expected a negative impact from political knowledge (Higgins, King, & Mavin, 1982; Wyer & Srull, 1989). The more recently an issue has been called into mind, the more likely it is to be accessible. This means that issues that have not been considered recently will take longer to retrieve, or may become inaccessible. In other words, the less knowledgeable are more susceptible to priming effects and the knowledgeable are more resistant to media influence. The early researchers on political-priming effects often used the term “vulnerable” to describe the anticipated influence of media that would shape the mind of an individual (see Krosnick & Brannon, 1993, p.972). This perspective resonated well with the dosage-resistance framework of political communication (Zaller, 1992). People who do not have crystallized perception about issues are likely to be less knowledgeable, and thus also less immune to media effects.

However, the impact of knowledge on priming effects varied from one study to another. It is almost as if a conflicting relationship with knowledge is an intrinsic characteristic of priming.

In their early work on media priming, Iyengar and colleagues found that the more knowledgeable are less susceptible to media priming effects (1984). They hypothesized that the more resources one has, the more resistant one would be to media priming. One

explanation is that the knowledgeable have already “crystallized calculi” (Miller & Krosnick, 1996, p. 84), in other words, the hierarchy of weights they give to each issue by which they make evaluations is already set. In a later study, Iyengar and Kinder (1987) found null effects of education on the media-priming process. Krosnick and Kinder (1990), in their analysis of the priming effects of the Iran-Contra scandal, found the most knowledgeable segment of the population was the least susceptible to priming.

In another twist, Krosnick and Brannon (1993) found that the knowledgeable are susceptible under certain conditions. They argue that media exposure, political interest and political knowledge are positively correlated with each other, but have opposite effects on media susceptibility. McGraw and Ling (2003) also found the knowledgeable are more susceptible, as long as the issues are novel. Contradictory explanations continued when Druckman and Nelson (2003) argued that knowledgeable individuals possess entrenched prior attitudes that reduce susceptibility to priming and framing. Again, Chong and Druckman (2007) argued that priming and framing have greater effects on more knowledgeable individuals. After the confusion, Miller and Krosnick (2000) stated that, “Priming seemed at first to be evidence of the manipulation of the most vulnerable segments of the electorate. But through the lens of political psychology, we have learned that these effects constitute exchanges between institutions and people that may instead reflect choices made knowingly by the most competent responsible citizens” (p. 315).

On the other hand, some scholars suggested that the time-lag after media coverage is the reason for the mixed results:

“Knowledge enhances priming by facilitating information storage and retrieval processes. Such processes are very likely to be involved in long-term priming over a period of months, as was the case in the Gulf War. But because the post event interviews for the Iran-Contra case were conducted immediately after the revelation, long-term storage and retrieval issues were probably less relevant, thus explaining the lack of a knowledge effect in this case (Krosnick & Brannon, 1993, p. 973).”

Time interacts with other variables to yield individual differences in priming effects. Most importantly, the susceptibility of priming effects is expected to be divergent. If the long-term effect of priming is a conscious, deliberative and intentional process, it is likely that individual variables such as cognitive ability and political engagement interact positively with media exposure. In contrast, the impact of cognitive abilities such as political knowledge is expected to be null or negative, since the accessibility effect is automatic and unconscious. In sum, rather than to predicate one direction for the moderation of political knowledge, I argue that the direction will be different depending on the time-lag of the priming effect. Furthermore, because this direction changes, political knowledge serves as an indicator that the priming is a dual process. Thus, in this dissertation I present two separate hypotheses about the impact of political knowledge:

**H5:** People with high political knowledge are more susceptible to the issue-priming effects in political campaigns.

**H6:** People with low political knowledge are more susceptible to the hydraulic pattern of issue-priming effects in political campaigns.

The next step in this study is to examine the impact of specific attribute traits on the main priming and the hydraulic pattern. The literature is scarce on this matter. Comparing competence and personality attributes, some researchers found that the media cover much more of the latter than the former (Kinder et al., 1980; Gans, 1979; Page, 1978). Even so, this does not guarantee that the media influence will be stronger for personality issues. Perceptions of presidential character in general, directly affect judgments about the candidates (Kinder, 1986). However, the attributes that are ingrained and crystallized into existing judgment systems are relatively immune to media influence. For these reasons, several separate hypotheses about the impact of political knowledge on attribute priming are presented:

**H7:** People with high political knowledge are more susceptible to the attribute-priming effects in political campaigns.

**H8:** People with low political knowledge are more susceptible to the hydraulic pattern of attribute-priming effects in political campaigns.

#### **ISSUE CHARACTERISTICS MATTER**

Previous studies show that some issues are robust against priming effects, while some issues are susceptible. In examining the hydraulic pattern of priming effects, it is imperative that issue-specific characteristics are taken into consideration. However, scholars concede that one of the most difficult tasks in the studies of media effects, not to

mention priming, is understanding how issue-type affects results (Bimber, Brundidge, & Lively, 2013). Previous studies have examined various dimensions of issue typologies in relationship with media influence, but few studies produced consistent results. The difficulty lies in the dynamic nature of political issues. Issue-characteristics change as information about that issue accumulates. It is also true that political issues involve multiple aspects. For example, crime issues were found to be susceptible to media influence in some studies (Zucker, 1978), and robust in others (Soroka, 2002; Ghanem, 1996).

Here, I will discuss three typologies of issue-characteristics in the literature. The purpose is to set up an appropriate guideline to interpret the result of the analysis.

### **Typology 1: Old versus new issues**

In this typology, studies report new issues are more susceptible to media influence than are old issues. Iyengar and Kinder (1987) found the media-priming effect was stronger for the energy issues than for unemployment issues. They argued that the difference stems from the relative novelty of energy as an issue. McGraw and Ling (2003) designed an experimental study that directly tested the impact of issue-characteristic on priming by gauging participants susceptibility on abortion (old) issue and newly introduced legislature called FMLA (Family and Medical Leave Act). The result was that the degree of the impact of political knowledge was different. The study found political knowledge inhibited the priming process when abortion was the target issue, but facilitated it when FMLA was the target.

Applying this typology of issues to hydraulic pattern of priming, I propose the following hypothesis:

**H9a:** Hydraulic pattern of priming effects will be more prominent for new issues than for old issues.

### **Typology 2: Obtrusive vs. unobtrusive issues**

Compared to priming, agenda-setting studies produced abundant findings about issue-specific effects (e.g., Zucker, 1978; Linsky, 1986; Soroka, 2002), which led some scholars to say, “If there is one thing the long public agenda-setting tradition in communications has clearly established, it is that issues matter a lot” (Walgrave, Soroka, & Nuytemans, 2008, p. 819). These studies divided issues according to the level of obtrusiveness. Obtrusive issues are described as issues with which we have firsthand experience. Zucker (1978) found that media had little or no agenda-setting effects as regards to obtrusive issues such as cost of living, unemployment and crime. Strong media effects were found for unobtrusive issues such as pollution, drug abuse and energy.

Soroka (2002, pp. 15-31) added a dimension of “concreteness” to obtrusiveness as a conceptual standard. According to the standard, he grouped political issues into three groups: prominent, sensational, and governmental. Sensational issues are unobtrusive and concrete, have tangible consequences and draw massive media attention. Prominent issues are obtrusive and have concrete effects, which people can observe in their own environment, for example, unemployment issues. Governmental issues are unobtrusive



and often without concrete effect. The largest effects are for sensational issues such as justice and crime.

Because of the relatively large amount of empirical findings of agenda-setting studies, it was revealed that developing a single ordinal scale of issue characteristic is a demanding job. Whether it is priming or agenda setting, the susceptibility of an issue seems to be relative, depending on the context within which it is discussed in the media, as well as how it is perceived by individuals. In Soroka's study (2002), the crime issue was unobtrusive and new because it was approached as law and order policy, whereas in Zucker's study (1978) the crime issue was obtrusive and old.

Applying the findings of agenda setting studies to hydraulic pattern of priming, I propose the following hypothesis:

**H9b:** Hydraulic pattern of priming effects will be more prominent for unobtrusive issues than for obtrusive issues.

### **Typology 3: Hard vs. easy issues**

Carmines and Stimson (1980) introduced the typology of hard and easy issues to describe voting behavior. They demonstrated that the relationship between education and political knowledge on one side, and issue voting on the other, is contingent on the type of issue. Carmine and Stimson's issue typology is characterized by three requisites. Easy issues are:

1. symbolic rather than technical,
2. more likely to deal with policy ends than means,

3. ones that have been on the political agenda for quite some time.

In short, easy issues are so ingrained over a long period that they structure the “gut responses” of voters to candidates and political parties (Carmines & Stimson, 1980, p.78). The hard/easy distinction is a relative criterion. An issue can be hard at first but easy at latter stages, as Carmine & Stimson (1980) explain, “All issues have intrinsically simple and complex facets; which particular facets predominate at a given time is an empirical question” (p.81).

Easy issues are those which have been ingrained over a long period, and do not need discussion or media exposure to influence the election. Hard issues, on the other hand, need to be extensively discussed. Zaller’s concept (1992) of attitude crystallization is also pertinent. Zaller reveals that the relationship between political knowledge and change of opinion is contingent on message intensity and attitude crystallization. Both Carmines et al. and Zaller found the strongest impact on hard issues, among the knowledgeable.

Each typology of issue-characteristic has pros and cons. The one that fits this project should be parsimonious. Also, the typology for this study should be relative rather than absolute. In this study, I was not looking for fixed and endemic characteristics of an issue, because they rarely exist in real settings. Especially in the political arena, the nature of issues changes dynamically over time. Considering these criteria, in this study hard/easy issues were considered a standard of issue-characteristics. In this framework of typology, the main priming and the hydraulic pattern are expected to be similar. Easy issues, defined as ingrained in human perception, would not easily go away.

Applying the typology of Carmines and Stimson (1980) to hydraulic pattern of priming, I propose the following hypothesis:

**H9c:** Hydraulic pattern of priming effects will be more prominent for hard issues than for easy issues.

### **Robustness of economic issues**

Among the issues, previous studies suggest that economy is particularly robust against media effects so that economy should be an exception to the typologies. For example, Domke and colleagues (1997) found that press coverage about the performance of Bob Dole on economic issues had little impact on candidate evaluation in the 1996 presidential election. Economy issues are robust to the hydraulic pattern of effects as well. For example, in Kinder and Krosnick's study (1990), even with the development of the Iran-Contra scandal, the importance of economic issues was not affected.

The other aspect of an economic issue as a political-evaluation criterion is that people tend to focus less on personal circumstances or their pocketbook, and more on national economic conditions, a tendency that has been termed the socio-tropic voting hypothesis (Gelman & King, 1993).

Rather than responding to the media coverage about candidates in the short term, the public tends to focus on the incumbent president to punish him for economic downturns or to reward him for periods of prosperity, although many economic policies are out of the president's direct control (Shah et al., 1999). In line with these findings is

the retrospective voting hypothesis, which posits that citizens base their voting choice on a running tally of evaluations of prior party promises and performance (Fiorina, 1981).

These characteristics of economic issues may be consequences of media coverage, rather than of its uniqueness. The economy is constantly covered in the media as a national issue, so that most people have some knowledge of the economy.

Thus, I propose the following hypothesis about the hydraulic pattern effects on economic issues:

**H9d:** Hydraulic pattern of priming effects will be less prominent for economic issues.

## Chapter 3: Method

### DATA

#### Content analysis data

In this dissertation, content-analysis coding of the 2008 presidential campaign news was administered for two purposes. The first was to create variables of issue and attribute news coverage, to test the priming effects hypotheses. The second was to identify prominent issues and attributes during the campaign, and to determine the time periods when those issues and attributes were dominant over others. The time span of the analysis was set as 185 days (from May 3, 2008 to November 3, 2008) in order to secure 6 month period from the election day.

Three media platforms, a mainstream newspaper, a network television and a cable news outlet were chosen. Thus, news stories from the front page of *The New York Times*, *ABC's World News*, *Fox News Channel's Special Report (America's election headquarters* in some periods) were collected. All story transcripts were retrieved from the *Lexis-Nexis* database, using the keywords "Presidential election", "president", or "candidate". These three media were chosen because *The New York Times* is considered one of the most influential media outlets in the nation, often influencing other news organization's standard of the newsworthiness of issues (Carpenter, 2007; Dearing & Rogers, 1996). *ABC's World News* was selected because it was the number one spot in the Nielson ratings among the network evening news broadcasts, and *Special Report* was

selected because *the Fox News Channel* was the number one news source among the cable news users during the time of analysis (Pew Research Center, 2008).

After excluding duplicate articles, non-campaign stories and news index, a total of 1,186 stories (344 from *The New York Times*, 420 from *ABC*, and 422 stories from *Fox News*) were analyzed.

Since the purpose of the content analysis was to produce time-series variables of media coverage, the number of stories was collapsed by date for each issue and attributes. The range, dimensions, and coding instructions of each media-coverage variable are in the appendix. In the coding categories, 14 issues<sup>1</sup> and 10 candidate attributes<sup>2</sup> were coded for every news article to correspond to the questionnaires of the survey data. In each article, the issues and attributes were dummy-coded as 0 or 1. They were collapsed by date to construct issue and attribute coverage variables so that the value of a variable represented the number of articles covering that issue or attribute on a particular day. Overall, the frequency of media coverage variable values ranged from 0 to 8 per day.

Intensity of news coverage has been measured in various ways in the literature of media effects. Such measurements as the frequencies of words (e.g., Rhee, 1997), paragraphs (e.g., Ha, 2011) phrases (e.g., Jenkins, 1999), or sentences (e.g., Kenski, Hardy, & Jamieson, 2010) have been used to investigate correlations between media coverage and behavioral outcomes. In the studies that examined a large set of

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<sup>1</sup> The 14 issues are: economy at national level, economy at personal level, tax, trade, financial crisis, health care, foreign affairs related to commander-in-chief, foreign affairs related to diplomacy, Iraq, immigration, abortion, gay rights, energy, and environment.

<sup>2</sup> The 10 attributes are: ideology, strong leader, experience, judgment, ready to be president, patriotic, share my values, too old, and too young.

observations for relatively long periods of time, the number of articles, like the measurement used in this dissertation, have also been proven to be effective (Stevens, 2012; Liu, 2011; Kelleher and Wolak, 2006; Druckman, 2004; Brousis & Wimann, 1991).

Three graduate students coded the articles after two days of training and pilot-test sessions. Coders were asked to code as many issues and attributes as possible from each article. However, they were asked to ignore issues that were not listed in the given codebook. For example, education and gun control were covered as campaign issues in the media, but coders were asked to ignore them.

The coding was administered according to the procedure specified by Krippendorff (2012). First, pilot analysis was employed taking just five units from each source for education purposes. All coders coded the same articles and exchanged a coder-by-coder matrix. Discussion and revision of the codebook was repeated until there was no uncertainty about the categorization of variables. Inter-coder reliability was measured by double-coding a random subsample of 60 stories of each platform, a total of 180 stories, which was 15.2% of the data. Measurement was repeated until all variables reached the threshold of 0.80. Finally, the inter-coder reliability corrected for agreement-by-chance (Krippendorff's alpha) ranged from 0.85 to 0.90 for issue variables, and from 0.80 to 0.84 for attribute variables. The coding instructions and a code sheet are shown in the Appendix. Descriptive statistics of the variables are shown in the next section.

## **Secondary survey data**

National Rolling Cross-Section (RCS) data from the National Annenberg Election Survey (NAES) 2008, were used to extract the outcome variable of this dissertation, issue and attribute weights. To acquire this data, telephone interviews with 57,967 randomly selected US adults were conducted daily starting December 17, 2007, through November 3, 2008, the day before the 2008 presidential election. The overall response rate was 23%.

For the NAES 2008, each day is a complete set of survey data. That is, more or less the same set of questions including issue position, political orientation, media use, campaign discourse, participatory behaviors, and demographic information were asked every day to yield corresponding results. Thus, the data provide the opportunity to analyze the dynamics of opinion evolution as aggregated sets of data, or sequential day-to-day time-series data (The Annenberg Public Policy Center, 2008; Mendelsohn, 1996). A rolling cross-sectional methodology was used to minimize daily fluctuation. For example, a sampling protocol is used, and interviews were equally spaced across time to ensure that each cross section had the same representation of population and had a constant respondent rate. In the period from May 3 to November 3, 2008, there were two days, July 4<sup>th</sup> (Independence day) and October 7<sup>th</sup>, without interviews. The number of respondents ranged from 313 to 40, depending on the campaign period. The questionnaire was regularly updated. In other words, some questions were asked throughout, and others were asked only for specific periods.

Among the 14 issues and 10 attributes listed in the content and survey data, six issue-weight variables: economy, Iraq, abortion, immigration, energy, and tax; as well as



six attribute-weight variables: experience, judgment, strong leader, trustworthy, share values, and too old (age) were selected. The selection procedure was as follows. First, using the content-analysis data, appropriate periods for analysis was selected. To ensure that the priming and hydraulic effects could be examined, periods were selected during which some issues/attributes were intensely covered by the media. Second, using the survey data, those issues/attributes that were not asked about within the selected study periods were excluded. Third, a final list was selected so that economic (economy, tax), social (immigration, abortion), foreign (Iraq) and environmental issues (energy) were included. For attributes, a final list was selected so that equal numbers of performance related attributes (experience, judgment, strong leader) and personality related attributes (trustworthy, share values, too old) were included.

## **MEASUREMENT OF KEY VARIABLES**

### **Issue and attribute coverage**

Created from the content analysis, these time-series variables tap the frequency of the media coverage about issues and attributes on a certain day. Table 3.1 shows the descriptive statistics of six issue- and six attribute-coverage variables. The maximum value was eight stories a day. The most frequently covered issue in the data was the economy ( $M = 1.92$ ,  $SD = 1.93$ ), followed by Iraq ( $M=1.72$ ,  $SD = 1.53$ ) and energy ( $M = 1.36$ ,  $SD = 1.22$ ). As for attributes, experience ( $M = 0.81$ ,  $SD = 0.75$ ) was followed by share values ( $M = 0.77$ ,  $SD = 0.81$ ) and trustworthy ( $M = .69$ ,  $SD = 0.83$ ).

Table 3.1 Descriptive Statistics of Issue and Attribute Coverage

	M	SD	Min	Max
Issues				
Economy	1.92	1.93	0	8
Iraq	1.72	1.53	0	8
Abortion	0.47	0.74	0	3
Immigration	0.31	0.56	0	3
Tax	1.35	1.57	0	6
Energy	1.36	1.22	0	6
Attribute evaluation				
Strong leader	0.46	0.57	0	4
Trustworthy	0.69	0.83	0	5
Experience	0.81	0.75	0	4
Judgment	0.62	0.75	0	4
Share values	0.77	0.81	0	6
Too old	0.34	0.58	0	5

*Note:* Values indicate numbers of articles per day (N = 185).

### Issue and attribute weight

These variables are the focal variables of this dissertation. Using the NAES 2008 survey data, I created aggregate-level time-series variables that tapped the importance perceived by the public of each issue and attribute. For that purpose, I ran OLS (Ordinary Least Squares) regression analyses of six issue-positions and six candidate-attributes for each of the daily survey data during the presidential campaign period between 3 May 2008, and 3 November 2007. Daily values of unstandardized regression coefficients were coded as the weights of issues and attributes.

With candidate approval as a dependent variable, five demographics (age, sex, income, education, race), two political-orientation variables (partisanship, ideology) and news-use variables (TV, talk radio, newspaper, online news) were controlled in

regression models. Issue-weight is the regression coefficient of that issue-position in the regression. For example, if the Iraq issue-position is a 10-point-scale response to the question “US should withdraw or keep troops in Iraq”, the issue-weight on day  $t$  is the value of  $\beta_{1t}$  in the following regression equation:

$$\begin{aligned} \text{Candidate approval} = & \beta_{1t} \text{ Iraq issue position} + \beta_{2t} \text{ political orientation} \\ & (\text{partisanship, ideology}) + \beta_{3t} \text{ demographics (age, sex, income, education, race)} + \\ & \beta_{4t} \text{ media use (TV, talk radio, newspaper, online news)} + r. \end{aligned}$$

Thus, the variable represents the importance the public places on a certain issue when evaluating the presidential candidate on a specific day, regardless of demographics, political orientation, or news use. The descriptive statistics of the six issue-weight and six attribute-weights created are shown in Table 3.2.

As will be elaborated in the next section, the candidate-approval variable was created by subtracting the favorability of John McCain from the Barack Obama favorability, a positive value of issue-weight means that the issue contributed favorably to Obama and a negative value means that the issue contributed favorably to McCain. On average, economy ( $M = .010$ ,  $SD = 0.38$ ), Iraq ( $M = 2.88$ ,  $SD = 0.99$ ), abortion ( $M = 0.59$ ,  $SD = 0.56$ ) and tax issues ( $M = 0.14$ ,  $SD = 0.98$ ) had a favorable impact on Obama, while immigration ( $M = -0.03$ ,  $SD = 0.42$ ) and energy issues ( $M = -0.32$ ,  $SD = 0.43$ ) favored McCain in the data. On the other hand, all the candidate attributes had a positive impact on Obama, on average.

Table 3.2 Descriptive Statistics of Projected Issue and Attribute Weights

	M	SD	Min	Max
Issues				
Economy	0.01	0.38	-1.28	1.14
Iraq	2.88	0.99	0.42	5.83
Abortion	0.59	0.56	-1.07	2.87
Immigration	-0.03	0.42	-1.84	1.05
Tax	0.14	0.98	-2.24	2.98
Energy	-0.32	0.43	-1.79	1.01
Attributes				
Strong leader	0.77	0.86	0.48	1.03
Trustworthy	0.77	0.88	0.42	0.98
Experience	0.94	0.14	0.44	1.06
Judgment	0.87	0.82	0.52	0.98
Share values	0.76	0.96	0.49	1.03
Too old	2.83	1.16	-1.24	6.49

N = 183 (there were two no-interview days)

### Political knowledge

This variable ( $M = 2.13$ ,  $SD = 1.22$ ,  $\alpha = 0.52$ ) was used as a moderator. It was created by adding the correct multiple-choice answers for four questions that ask about general political knowledge: “Who determines if a law is constitutional?”, “Is a majority required to override a presidential veto?”, “What party has the most members in Congress?”, and “How are supreme court justices chosen?”

## **Variables used to create issue and attribute weights**

### ***Candidate approval***

This variable is based on the difference between the favorability of McCain and that of Obama. Each respondent was asked to rate the two presidential candidates on a scale from 0 to 10 (10 = very favorable). Then a new variable was created by subtracting McCain favorability from that of Obama. A positive value thus would mean that Obama's approval was higher than McCain's. This variable had a mean of 0.27 and a standard deviation of 5.14, indicating that respondents, on average, slightly favored Obama over McCain. Previous studies used this method of creating a candidate-approval variable with time-series analysis (Kenski, Hardy, & Jamieson, 2010; Romer, 2006; Rhee, 2001). The advantage of this method is that it can remove the idiosyncratic variation of self-reported scale by respondents (see Kenski, 2006, pp. 60-61).

### ***Issue position***

*Economy* Respondents were asked if they think the economic conditions in this country were much better one year ago than they are right now, on a scale of 1 to 5. Answers were reverse coded so that positive evaluations had higher scores ( $M = 3.45$ ,  $SD = 1.18$ ).

*Iraq* Respondents were asked if they think the US should withdraw or keep troops in Iraq. The answers were dummy coded so that withdrawal opinions scored 1, keeping troops scored 0 ( $M = 0.124$ ,  $SD = 0.330$ ).

*Abortion* Respondents were asked if they think abortion should be available or restricted, on a scale of 1 to 4. Answers were reverse coded (“abortion should be available to anyone” = 4, “available with stricter limits” = 3, “not permitted except for rape, incest, or life risk” = 2, and “not permitted under any circumstances” = 1 ( $M = 2.61$ ,  $SD = 1.16$ ).

*Immigration* Respondents were asked on a scale of 1 to 4 if they favored a path to citizenship for those who are in the US illegally. The answers were reverse coded so that the favorable opinion had a higher point ( $M = 2.49$ ,  $SD = 1.10$ ).

*Tax* Respondents were asked if they think taxes should be cut or increased. The answers were dummy coded so that cutting taxes opinion scored 1 and other answers (keep as they are, raise if necessary, none of these) scored 0 ( $M = 0.15$ ,  $SD = 0.36$ ).

*Energy* Respondents were asked if they favored lifting the federal ban on oil drilling in waters off the coast of the US, on a scale of 1 to 4. Answers were reverse coded so that the favorable opinion had a higher point ( $M = 3.05$ ,  $SD = 1.17$ ).

### ***Attribute evaluation***

Initially, respondent evaluations about 11 candidate attributes were examined. Considering the media coverage and availability of data during the campaign period, six attributes were selected for analysis.

*Strong leader* Respondents were asked how well the phrase “strong leader” applies to Obama and McCain on a scale of 0 to 10 (0 = does not apply at all, 10 =

applies extremely well). The variable was created by subtracting the McCain score from the Obama score ( $M = -0.58$ ,  $SD = 4.47$ ).

*Trustworthy* Respondents were asked how well the phrase “trustworthy” applies to Obama and McCain. The variable was created by subtracting the McCain score from the Obama score ( $M = -0.40$ ,  $SD = 4.64$ ).

*Experience* Respondents were asked how well the phrase “has the experience needed to be president” applies to Obama and McCain. The variable was created by subtracting the McCain score from the Obama score ( $M = -2.00$ ,  $SD = 4.39$ ).

*Judgment* Respondents were asked how well the phrase “has the judgment needed to be president” applies to Obama and McCain. The variable was created by subtracting the McCain score from the Obama score ( $M = -0.54$ ,  $SD = 4.76$ ).

*Shares values* Respondents were asked how well the phrase “shares my values” applies to Obama and McCain. The variable was created by subtracting the McCain score from the Obama score ( $M = 0.19$ ,  $SD = 5.43$ ).

*Too old* Respondents were asked if they feel McCain is too old to be president. Yes was coded as 1, and No was coded as 0 ( $M = 0.197$ ,  $SD = 0.398$ ).

### ***Controls***

*Demographics* Five variables were included in the regression model to calculate each issue/attribute weight: age ( $M = 53.3$ ,  $SD = 16.0$ ); sex (42.3% Male,  $SD = 0.49$ ); education ( $M = 5.56$ ,  $SD = 2.316$ ); education (Mdn = Associate or two-year college

degree), income (Mdn = \$ 50,000 to less than \$75,000 total annual household income), and race (82.9% white).

*Political orientation* Two variables were included in the regression model to calculate each issue/attribute weight: ideology and partisanship. Ideology (M = 2.79, SD = 1.14) was measured by asking respondents to rate their political ideology using a 5-point scale where '1' indicates very conservative and '5' indicates very liberal. Considering the dependent variable, partisanship (M = 0.35, SD = 0.48) was recoded as Democrat =1, Republican, independent and others as 0.

*News use* The respondents were asked how many days in the past week they used the four news media to get campaign information, and used as controls were: TV news (M = 5.47, SD = 2.46), political talk radio (M = 1.72, SD = 2.57), newspaper (M = 2.91, SD = 3.02), and online news (M = 2.93, SD = 3.03). Table 3.4 lists the descriptive statistics of the variables from the survey data.

Table 3.3 Descriptive Statistics of the Variables in the Survey Data

Variables	M	SD	Min	Max
Political knowledge	2.13	1.22	0	4
Candidate approval	0.27	5.14	-10	10
Issue position				
Economy	3.45	1.18	1	5
Iraq	0.12	0.33	0	1
Abortion	2.61	1.16	1	4
Immigration	2.49	1.10	1	4
Tax	0.15	0.36	0	1
Energy	3.05	1.17	1	4
Attribute evaluation				
Strong leader	-0.58	4.47	-10	10
Trustworthy	-0.40	4.64	-10	10
Experience	-2.00	4.40	-10	10
Judgment	-0.54	4.76	-10	10



*Table 3.3 continued from p.51*

Variables	M	SD	Min	Max
Share values	0.19	5.43	-10	10
Too old	0.20	0.40	0	1
Political ideology	2.79	1.14	1	5
Partisanship	0.35	0.48	0	1
TV use	5.47	2.46	0	7
Talk radio use	1.72	2.57	0	7
Newspaper use	2.91	3.02	0	7
Online news use	2.93	3.03	0	7
Age	53.26	16.0	18	97
Sex	0.42	0.49	0	1
Race	0.83	0.38	0	1
Education	5.56	2.31	1	9
Income	5.78	2.16	1	9

## **STUDY DESIGN**

The analytical framework of this dissertation was designed to test the main priming effects, the hydraulic pattern effects, and the impact of political knowledge on the main priming effects and the hydraulic pattern effects, by looking into the relationship between issue/attribute coverage and issue/attribute weights. Figure 3.1 shows the conceptual process of the design.

First, the main priming effects of issues (H1) was tested by examining the causality between the coverage and the weight of the same issues. For example, if the time-series variable-economy coverage causes the time-series variable-economy weight, the hypothesis of the main priming effect is supported. The causality was tested for all other issues: Iraq, abortion, immigration, energy and tax.

A similar process was employed to test the main priming effects on candidate attributes (H3). Also, causality was tested for all six attributes: experience, judgment, strong leader, trustworthy, share values, and too old.

Second, the hydraulic pattern of issue priming (H2) was tested by examining whether media coverage of an issue causes the weight of other issues. For example, if the time series variable economy-coverage causes the time-series-variable Iraq weight, the hypothesis of the hydraulic pattern of issue priming is supported.

In this process, it was necessary to discover the dominant issues in media coverage. Not all data warranted examination because in some periods, the media mentioned a limited number of issues, while in others, there was not much variation of coverage intensity. For example, if the issue of abortion was not covered in the media at all, it is meaningless to test the causality of abortion coverage → economy weight. Borrowing from earlier studies (Pan & Kosci, 1997; Hilgartner, 1998) which utilized the concept of issue regime, the research included the trends in the media coverage, identified the turning points of the amount of news, and determined dominant issues by restricting the time period. To consider issue-specific effects, my research included a search for periods in which more than two issues or attributes competed for attention in the media-coverage data. The first period (24 June to 22 August) was selected for issue-priming analysis. The second period (3 May to 9 September) was selected for attribute-priming analysis.

The hydraulic pattern of priming was examined by testing the causality of a dominant issue with five other issues. The same process was repeated to test the hydraulic pattern of the attribute pattern (H4).

To test the moderation of political knowledge, the data were split into high and low knowledge groups by the median value (political knowledge = 2). The low knowledge group (0 to 2) made up 57%, and high knowledge group (3 to 4) made up 43%, of the total observations (57,967). The frequency and percentage of political knowledge for each score is shown in Table 3.5. For each of the high and low knowledge groups, issue and attribute weights were calculated by running the regression again. Thus, H5 that involved the susceptibility of the main-priming effects of issues was examined by comparing the relationship of the same-issue categories between the high and low knowledge groups. The susceptibility of the hydraulic pattern (H6) was examined by comparing the relationship of the different issue-categories between the high and low knowledge groups. Likewise, the susceptibility of the main priming (H7) and the hydraulic pattern (H8) of attribute priming, in relation to political knowledge, was also tested.

Table 3.4 Frequency and Percentage of Political Knowledge

Value	Frequency	Percent	Cumulative Percent
0	6,931	12.0	12.0
1	11,206	19.3	31.3
2	15,301	26.4	57.7
3	16,432	28.3	86.0
4	8,097	14.0	100.0
Totals	57,967	100.0	

For each causality one optimal time lag is determined. The method of specifying optimal time lags are described in the next section. Research questions were asked about the time-lag of issue-priming effects (RQ1), its hydraulic pattern (RQ2), and attribute-priming effects (RQ3), with its hydraulic pattern (RQ4). Research questions also asked to compare the time lags between the main priming and the hydraulic pattern of effects. Time lags are compared between the same issues and attributes, so that issue-specific differences are controlled.

#### **STATISTICAL ANALYSIS: CAUSALITY AND TIME-LAG**

Vector auto-regression (VAR) methodology was used herein to evaluate the relationships of time-series variables. The selection of this methodology over other time-series methodologies (such as ARIMA and time-lagged correlations) was because of its flexibility in establishing causality among variables. VAR is a multivariate extension of the Granger (1969) approach to causality inference. Each variable is regressed on lagged values of itself and other variables in the system. This allows examination of the relationships without having to pre-determine the direction or the length of lags of causality.

In this research, the hydraulic pattern of priming, as well as the main priming effects are tested. The causality of the hydraulic pattern effects is not theoretically assured. Added to this obscurity is that sometimes, perception causes news coverage rather than the other way around, as a time-series study shows that general perception

about an issue precedes media coverage (Uscinski, 2009). VAR is particularly useful when there is no prior theory to establish specific conditions, such as direction of causation or length of the lag (Stock & Watson, 2003).

The goal of my use of the VAR methodology is to identify Granger causality (1969). A variable  $x$  is said to Granger-cause another variable  $y$  if past values of  $x$  help predict the current level of  $y$  given all other information. Since Granger causality implies a correlation between the current value of one variable and the past values of others, it is sensitive to the lag between the present and the past.

Granger causality is not identical to true causation in the classical sense, but it is accepted that Granger causality demonstrates the likelihood of causation or the lack of such causation more forcefully than does contemporaneous correlation (Geweke, 1984). Because of its flexibility, the Granger causality test has been widely used in the literature of media effects and political communication, and the results have been recognized as a true causality test (Kenski and Stroud, 2007; McCleary et al., 1980). For example, studies tested Granger causality to find the media agenda-setting effects about specific issues such as community concerns (Smith, 1987), AIDS (Rogers, Dearing, & Chang, 1991) and global climate change (Liu, Lindquist, & Vedlitz, 2011). On the other hand, the Granger causality test is also used to show public perception of media coverage, for example, how the media's tone is influenced by the presidential approval rate (Edwards et al., 2013). There have also been studies that have used Granger causality to identify the direction between mutually interactive variables, for example, if the public agenda influences the media agenda or vice versa (Uscinski, 2009). Other examples of studies on the direction

of causality include two inter-media agenda-setting studies that tested the influence between online and offline platforms (Groshek & Groshek, 2013; Meraz, 2011).

VAR is appropriate for the present research because here, the time-lag of causality is the object of investigation, not the given conditions. Various units and lengths of lags have been used in previous studies, but most of them used the lags as given. However, in this dissertation, research questions were asked that should indicate separately the time-lag of issue-priming effects (RQ1) along with its hydraulic pattern (RQ2), and the attribute-priming effects (RQ3) along with its hydraulic pattern (RQ4), assuming that each effect may have different lags.

The definition of optimal lag in VAR is the number of lags that adequately models the dynamic structure, so that the coefficients of further lags of variables are not statistically significant. VAR examines all the hypotheses for possible bivariate relationships within the time block, including causality among mutually interactive variables.

The standard process of determining a proper number of lags occurs in two-steps: theoretical plausibility and lag-order selection statistics (Soroka, 2002). The strategy employed here is similar. First, the maximum lag was pre-set to one quarter of the total time period. The use of too few lags, distorts the results of Granger causality due to the autocorrelation inherent in time-series data, hence using only one or two lags provides false positives. On the other hand, the use of too many lags dilutes the power of the test and may provide false negatives (Stock & Watson, 2003).

Within that time-lag, the fitness of a lag model is determined by statistical significance. The statistical index of Akaike's Information Criterion (AIC) is used to select an optimal lag, among the lags that are significant. Among the index of lags such as final prediction error (FPE), Hannan and Quinn information criterion (HQIC), and Schwarz's Bayesian information criterion (SBIC); Liew (2004) found that AIC was superior in identifying lag orders. AIC shows a relative estimate of the information lost when a given model is used to represent the relationship among variables.<sup>3</sup> Therefore, the lower the value of AIC, the better the model is. For these reasons, AIC is used in the research of political communication when assessing goodness-of-fit of structural-equation modeling and time-series analysis.

By utilizing the optimal time-lag of VAR models, this dissertation tests the moderating impact of knowledge on the susceptibility of priming and on the hydraulic pattern effects.

Since daily cross-section data are subject to sampling variation (Johnston et al. 1992), all time-series variables created from NAES data were smoothed out using a 7-day moving average. To test the stationarity and auto-correlation within variables, this study employed Dickey-Fuller tests. Media-coverage variables were found to be non-stationary. To balance, both the media coverage and issue/attribute weight variables were differentiated with 1 lag. Tests were employed again and all variables were stationary.

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<sup>3</sup> In the basic usage, the AIC is  $AIC = 2k - 2\ln(L)$ , where  $k$  is the number of parameters in the statistical model, and  $L$  is the maximized value of the likelihood function for the estimated model.

## COMPARISON WITH PREVIOUS METHODS

The method used in this dissertation differs from previous studies in that it examines the direct causal relationship between media coverage and the perceived importance of issues and attributes. The concept of priming is polysemic, and scholars have used different methods to examine the effects (Marquis, 2007; Roskos-Ewoldsen et al., 2009). In the studies that utilized survey data, however, the causal relationship between the dynamic intensity of media coverage and issue weight, has rarely been established. Here, the argument is presented that the influence of media coverage was presumed, not tested in previous survey studies of priming. The conflicting findings, particularly those about the susceptibility and the nature of priming effects, derive from this limitation. The strategy of the present research was designed to avoid this conflict. Exemplifications of previous survey studies illustrate the rational of this argument.

The outcome variable of priming effects is the changing of issue-weights, a term which designates the perceived importance of issues in evaluating political figures.

Iyengar and Kinder (1987) operationalized the priming effect as follows:

the difference between the impact of the evaluation of handling of a particular problem on the evaluation of the president's overall job performance when the stimulus news did not cover the problem (baseline) and the impact of the evaluation of the handling of a particular problem on the evaluation of the president's overall job performance when the news



covered the problem (experimental treatment) in the same multiple regression equation (pp. 144–147).

In a lab experiment, comparing issue weights was done by randomly assigning groups to view (or not view) media messages about issues (Iyengar & Kinder, 1987; McGraw & Ling, 2003). Here, participants are actually exposed to media content. The intensity of media exposure is regulated by the time, quantity or placement of content.

However, in survey studies, the relationship between media coverage and priming effects is blurred. As for the outcome variables of priming research, the literature shows that there have been three methods. First, in some studies, researchers calculated the difference of issue-weights between multiple sets of data over time, most of which were panel samples (Malhotra & Krosnick, 2007; Krosnick & Brannon, 1993; Krosnick & Kinder, 1990; Kim, 2005). Second, in other studies using cross-sectional data, the samples were partitioned into heavy and light media users (Kim, Han, & Scheufele, 2010), or groups paying high or low attention to news or issues (Druckman, 2004). In a third group of studies, an interaction variable was created between time and focal issues, in a regression model. Mendelsohn (1996) created interaction variables between date and issue position (FTA), personality (trustworthy) and party position (strength of partisanship) to see the priming effect during political campaigns. Krosnick and Brannon (1993) dummy-coded pre- (0) and post-Gulf-war (1) and saw interaction s with issue variables. Positive and significant interaction coefficients in regression models are recognized as indicators of priming effects.

In the first type of survey studies, media coverage data was used as circumstantial evidence that the difference in issue weights was due to the intensity of news. For example, Krosnick and Kinder (1990) used two sets of National Election Survey (NES) data provided by interviews before and after the official unfolding of the Iran-Contra scandal. The study presented a figure of content-analysis data which showed the increase of the number of lines per day devoted to the Nicaraguan Contras on the front page of *The New York Times*. However, the relationship between media coverage and priming effects were not directly tested. A similar method was used in the survey studies that followed. Kim (2005) used content analysis of statements in broadcast news to show that both the pros and cons of the Gulf War were actively debated in the media and that they changed after the war. Again, no media variable was incorporated into the analysis model.

Similarly, in the second type, media analysis data were used to justify sample partition. Druckman (2004) conducted a content analysis but only used the results to construct the hypothesis that the comparison between newspaper subscribers and non-subscribers demonstrates the priming effects. As for the third type, a study by Mendelsohn (1996) did not measure news, but presumed that as the campaign nears the vote, the media coverage intensified.

The consequence of these methodological frameworks is that the dynamics of the priming effects, the impact of time and intensity in particular, cannot be considered in the results. In this dissertation, I argue that the mixed results about the relationship between the level of political knowledge and the susceptibility to priming effects, is due to

methodological limitations. As reviewed in Krosnick and Kinder's findings (1990), which included samples of interviews done the day after the breakout of the Iran-Contra scandal, the knowledgeable were less susceptible to priming effects. In contrast, for the study by Krosnick and Brannon (1993), which had a relatively longer lag after the interview, the direction of the impact of knowledge was opposite.

Thus, if we accept the hypotheses that there are two kinds priming effects that happen sequentially, they will be better tested by incorporating different time-lags into the model. Arguably, the survey studies have strong points over experiments in that they were produced in the realistic settings of the political arena (Krosnick & Kinder, 1990). However, with only a few exceptions (Wilnut & Zhu, 1997), the relationship between media coverage and the change of issue-weights has only been presumed, not tested.

The methodological vulnerability of the survey studies of priming is due to the level-of-analysis problem inherent in the theoretical framework of priming. Whereas agenda-setting is focused on the aggregate trend of public opinion, priming offers explanations of media influences at the individual level, by "providing empirically grounded psychologically plausible account of how individuals form and revise their views of presidential performance" (Krosnick & Kinder, 1990, p. 509). That is, focal variables in priming studies are individual-level variables such as the issue-position and the political evaluation of the respondents. This individual-level effect is one of the strengths of priming theory. However, a straightforward examination of the impact of the intensity of media coverage, which is at the aggregate level, is difficult.

Some studies showed attempts to overcome these limitations. Pan and Koscki (1997) utilized the concept of issue regime (Hilgartner, 1988), to determine a turning point of a media-coverage trend. Having defined issue-regime as “an identifiable time period in which one issue absorbs the dominant amount of attention resources available in the public arena” (p.4), they operationalized an issue-regime with two criteria. First, an issue should receive the largest amount of media coverage, compared with other issues. Second, an issue should be mentioned as the most important issue (or problem) facing the nation, compared with other issues. However, the priming effect was measured by regressing a three-way-interaction variable (news exposure  $\times$  time  $\times$  issue-positions). Their study was an advancement in that the time interval over which a certain issue was actively covered was specified; however, the direct causality between media coverage and priming effects was still not established.

In this dissertation, I argue that in order to assess the dynamic influence of media coverage, the creation of an aggregate-level outcome variable is necessary. As an exception, Malholtra and Krosnick (2007) examined the relationship by looking into the bivariate correlation between amount of news coverage, and the change of issue-weights a week after. The regression coefficients were treated as an aggregate-level variable that corresponds to the media variable. However, this study is also vulnerable to criticism by assuming a fixed length of one week as the lag of effects. Priming effects are time sensitive. Moreover, the time-lag, the length of time between the dosage (news exposure) and priming effects, may vary. The issue-characteristics are expected to influence the time-lag. Also, the amount of news coverage may itself shorten the time-lag for the

effects to occur. Given that one of the research questions of this dissertation is to find out the optimal time-lag of priming effects in political campaigns and how it varies, the study design was set up to overcome the limitations of these previous methods.

## Chapter 4: Results

### ISSUE PRIMING

#### Description of the Period (6/24–8/22) and Issues

The 56-day period from June 24 to August 22, 2008 was chosen for the analysis of issue priming. Overall, the causality between the media coverage and the weights of six issues (economy, Iraq, abortion, immigration, energy and tax) are examined. Table 4.1 shows the descriptive statistics of media coverage and issue weights.

For the main priming effects, six pairs of bivariate relationships between the same issue coverage and issue weight are examined.

Table 4.1 Descriptive Statistics of Media Coverage and Issue Weights

	Mean	Min	Max	SD	N
Issue Weight					
Economy	0.10	-1.28	1.14	0.47	55
Iraq	2.57	0.42	5.02	1.02	55
Abortion	0.34	-1.07	2.86	0.75	55
Immigration	-0.02	-1.84	0.97	0.53	55
Energy	-0.84	-1.79	0.69	0.64	55
Tax	0.17	-2.24	-2.24	1.08	55
Media Coverage					
Economy	1.11	0	5	1.19	56
Iraq	1.98	0	8	1.81	56
Abortion	0.26	0	2	0.48	56
Immigration	0.38	0	2	0.55	56
Energy	1.82	0	6	1.75	56
Tax	0.78	0	4	0.92	56

For the hydraulic pattern effects, issues that were actively covered in the media are identified from the data first. The selected period is a period in which coverage of two issues were dominant, Iraq ( $M = 1.98$ ,  $Max = 8$  per day) and energy ( $M = 1.82$ ,  $Max = 6$  per day). The effect is examined by looking into their bivariate relationship with other issues.

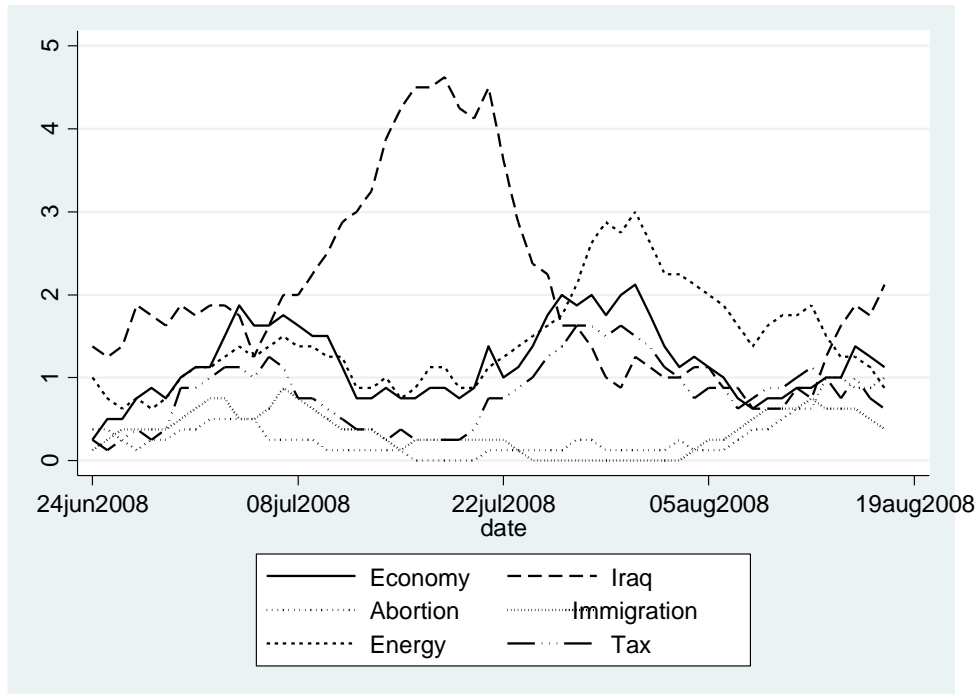
Figure 4.1 shows the trend of media coverage in this period. Iraq coverage peaked in the third week of July. Energy coverage peaked in the first week of August. On July 21, Obama visited Iraq, making the troop withdrawal from Iraq a salient issue. On the other hand, the candidate position of energy issue was intensely covered from the end of July to August.

Comparing the issue characteristic about new and old, it is necessary to consider the context of the campaign issues. The characteristics of issues will vary depending on the period of campaign and the topics of news. For example, Iraq issue will be considered new at the beginning of the war, but was less so in 2008 presidential campaign. Energy issue will be unobtrusive if news are covered as international relations, but obtrusive if people perceive it as an issue about gas prices. Energy issue in this period raised coverage by McCain's offensive to take a momentum of high gas prices in that period. The Republicans took new initiatives such as a call for the resuming of offshore drilling to increase the importance of energy issue (see Kenski, Hardy, & Jamison, 2010, pp. 119–121).

Given these contexts, I consider energy issue to be newer (typology 1) than Iraq issues. Thus H9a will be examined by comparing the susceptibility of the two issues. As

for obtrusive vs. unobtrusive issues (H9b: typology 2), social issues (abortion, immigration) will be considered obtrusive, therefore less susceptible. As for H9c about the typology of hard vs. easy issue (typology 3), Carmine and Stimson (1980) suggested criteria of easy issue as symbolic rather than technical, more likely to deal with policy ends than means, and ones that have been on the political agenda for quite some time. Given the context of this period, I consider Iraq as easy, energy as hard issue.

Figure 4.1 Trends of Media Coverage



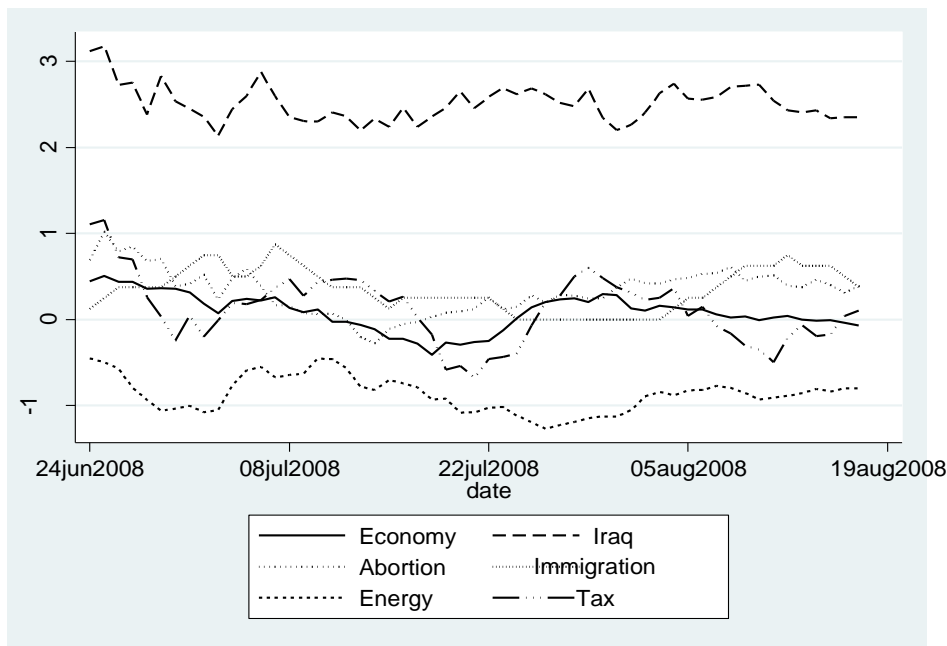
*Notes.* Y: issue weights. Variables are smoothed out by 7-day center moving averages.

Turing to issue-weights, the Iraq issue was perceived as the most important ( $M = 2.57$ ,  $SD = 1.02$ ) and was strongly favorable to Obama. Other issues in favor of Obama



were economy ( $M = 0.10$ ,  $SD = 1.19$ ), abortion ( $M = 0.34$ ,  $SD = 0.75$ ), and tax ( $M = 0.17$ ,  $SD = 1.08$ ). The issue-weights favorable to McCain were energy ( $M = -0.84$ ,  $SD = 0.64$ ) and immigration ( $M = -0.02$ ,  $M = 0.53$ ). Figure 4.2 shows the trend of issue-weights in this period.

Figure 4.2 Trends of Issue Weights



*Notes.* Y: issue weights. Variables are smoothed out by 7-day center moving averages.

### Main Priming Effects (H1, RQ1)

The first step to be taken is to test for main priming effects. The first hypothesis of this dissertation predicted that the media coverage of an issue will change the importance of that issue when evaluating candidates in a political campaign (H1). The

hypothesis was examined by employing Vector auto-regression (VAR) analysis to test if media coverage Granger-causes issue weight<sup>4</sup>.

Table 4.2 represents the Granger causality tests of the six pairs of issue-coverage and issue-weight. The result is generally in support of H1. Issue coverage Granger caused issue weight in all the issues except that of immigration. That is, the media primed economy, Iraq, abortion, tax and energy issues. The non-significant result of immigration issues may be due to the low intensity of the media coverage. As shown in Table 4.1, the mean of the media coverage of the immigration issue, in the combined data of the New York Times, ABC News and Fox News, was only 0.38 articles per day during this period.

Next, the first research question asked about the time-lag of the main priming effects (RQ1). Among the five issues that showed causal relationships, energy and economy issues had the optimal time-lag of 8 days, Iraq and tax issues had the optimal time-lag of 7 days and Abortion time-lag of 3 days. The reason may involve the intensity of the media coverage. The coverage of abortion in this period was less frequent ( $M = 0.26$ ). The Granger causality of this issue may be of a different nature than other issues which were covered constantly throughout the period. In this case, the abortion issue can be considered an outlier, and the optimal time-lag of the main priming effect would be 7 to 8 days.

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<sup>4</sup> As described in the study design section, Dicker-Fuller tests showed the issue coverage variables of Iraq were non-stationary. In order to employ time-series analysis, all six issue-coverage and issue-weight variables were differentiated with 1 lag.

Table 4.2 Granger Causality Test Examining Main Priming Effects

Media coverage	Issue weight	Optimal lag	Coefficient	Chi square	P value
Economy	Economy	8	0.54	20.44	0.009
Iraq	Iraq	7	0.21	14.75	0.039
Abortion	Abortion	3	0.28	16.17	0.035
Immigration	Immigration	ns	ns	ns	ns
Energy	Energy	8	0.66	21.18	0.013
Tax	Tax	7	0.24	15.13	0.034

**Hydraulic Pattern Effects (H2, RQ2, H9a-d)**

Beyond the main priming effects, there is a hypothesis about the hydraulic pattern of priming, that is, the media coverage of one issue causes a change in the importance of other issues in political campaigns (H2). To examine the hypothesis, the Granger causality of the issue-coverage of Energy and Iraq was tested with the other issues. Thus ten bivariate relations were examined. The two issue-coverage variables selected, were used because they were the most actively covered issues (Table 4.1).

Table 4.3 Granger Causality Test Examining Hydraulic Pattern Effects

Media coverage	Issue weight	Optimal lag	Coefficient	Chi square	P value
Energy	Economy	ns	ns	ns	ns
	Iraq	5	-0.01	9.42	0.024
	Abortion	ns	ns	ns	ns
	Immigration	ns	ns	ns	ns
	Tax	6	-0.36	17.34	0.015
Iraq	Economy	5	-0.58	15.80	0.007
	Abortion	6	-0.77	18.50	0.018
	Immigration	5	0.74	12.98	0.009
	Energy	6	1.10	15.90	0.014
	Tax	5	0.69	20.27	0.007

In the results, the coverage of energy Granger-caused the weight of Iraq and Tax. It did not Granger-cause the weights of economy, abortion and immigration. As for the coverage of Iraq, causality was found with all five of the issues.

Graphs of the six causal relationships are shown in Figure 4.3. It shows that when the coverage of energy increased, the weight of Iraq and Tax decreased. Also, when the coverage of Iraq increased, the weight of economy, abortion, immigration, energy and tax decreased. Considering that Iraq Granger-caused all of the other issues weights, H2 is supported.

Next, RQ2 asked about the optimal time-lag in the hydraulic pattern of issue priming. The result of the VAR analysis shows the optimal time-lag ranged from 5 to 6 days. Compared to the 7–8 day lag of the main priming effects, the optimal time-lag of hydraulic effects was shorter.

H9a-d examined the issue characteristic differences of the effects. H9a predicted hydraulic effects were more prominent in new (energy) issues. H9b predicted obtrusive issues to be less prominent in hydraulic effects, and H9c predicted hard (energy) to show more prominent effects in hydraulic pattern. H9d predicted economy issue will be robust to hydraulic pattern effects.

In the results, Granger causality of Energy  $\rightarrow$  Iraq, and Iraq  $\rightarrow$  Energy were both significant at similar time lags (5 and 6). The examination failed to support H9a and H9c. As for H9b, Granger causality of energy with social issues (abortion and immigration) was non-significant, while with other relationships, Granger-causality was established.

H9b is supported. Economy issue was robust to the influence of energy issue. But Iraq issue Granger caused economy issue. H9d is partially supported.

As with the main priming, the difference in the effects between the energy and Iraq issues can be described by the intensity of media coverage and the inherent characteristics of these issues. Iraq was more intensely covered by media, thereby exerting stronger influence on the issues weights. Also, Iraq issue can be considered as newer, obtrusive and harder issue than energy, there by exerting a more responsive effects.

Figure 4.3 Graphs of Hydraulic Relationships



*Notes* Y: articles per day. Solid line is media coverage, dash line is issue weight. Variables were smoothed out by 7-day center moving averages. Statistical analysis is administered by differenced values.

## **Impact of Political Knowledge**

### ***Main Priming Effects (H5)***

H5 predicted that those with more knowledgeable are more susceptible to the main priming effect. Here, susceptibility was compared by looking into the existence of causal relationships and the time-lag of those relationships. In political campaigns where the media covers issues continuously, one can say a person is more susceptible to media influence if the perception of a subject changes sooner. Next, the susceptibility of high- and low-knowledge groups, for each issue, was compared. By looking into the difference in susceptibility for each issue, the idiosyncratic differences in issue-characteristics were controlled. The Granger causality test results and the comparison between high- and low-knowledge groups are presented in Table 4.4.

As for economy, immigration and energy issues, the main priming effects did not occur for the low-knowledge group. For Iraq, the time-lag of the low-knowledge group (9 days) was longer than the high knowledge group (5 days). Abortion and tax issues showed no difference in time-lags between high- and low-knowledge groups.

Overall, the main priming effects did not occur, or the time-lag was longer, for the low-knowledge group. Thus, H5 is supported. The knowledgeable are more susceptible to the issue-priming effects in political campaigns.

Table 4.4 Granger Causality Test for Main Priming Effects of High and Low Political Knowledge Groups

Media coverage	Issue weight	Knowledge	Optimal lag	Coefficient	Chi square	P value
Economy	Economy	High	7	-0.37	14.14	0.049
		Low	ns	ns	ns	ns
Iraq	Iraq	High	5	0.41	19.82	0.001
		Low	9	-0.25	19.33	0.023
Abortion	Abortion	High	3	0.02	13.52	0.004
		Low	3	0.04	10.18	0.007
Immigration	Immigration	High	5	0.27	13.96	0.016
		Low	ns	ns	ns	.ns
Energy	Energy	High	8	-0.36	15.73	0.046
		Low	ns	ns	ns	ns
Tax	Tax	High	7	-0.18	16.16	0.024
		Low	7	0.07	14.19	0.001

### ***Hydraulic Pattern Effects (H6)***

In this dissertation, I argue that the main priming effects and the hydraulic pattern of priming effects are different effects, with different mechanisms. The main priming process is a dual process where two kinds of effects are mixed. As the media continuously covers issues, temporal accessibility effects will develop into effects of applicability and/or learning effects via chronic accessibility. The hydraulic pattern is related to temporal accessibility, and is relatively short term and automatic, whereas the main priming effects at the optimal stage, are long term and deliberative. Here, a hypothesis was proposed that for the main priming, because of its deliberative nature, the knowledgeable are more susceptible. The hypothesis advanced for the hydraulic-pattern effects, predicted that the results would be opposite. The low-knowledge group would be more susceptible (H6), that is, the knowledgeable would be more resistant.



Table 4.5 Granger Causality Test for Hydraulic Pattern Effects of High and Low Political Knowledge Groups

Media coverage	Issue	Knowledge	Optimal lag	Coefficient	Chi square	P value
Energy	Economy	High	ns	ns	ns	ns
		Low	5	-0.28	16.97	0.005
	Iraq	High	6	0.21	11.44	0.043
		Low	5	-0.05	9.30	0.027
	Abortion	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
	Immigration	High	ns	ns	ns	ns
		Low	2	0.17	7.03	0.030
	Tax	High	7	-0.24	20.37	0.005
		Low	3	0.10		0.006
	Economy	High	5	1.04	16.83	0.005
		Low	7	0.18	14.57	0.042
Iraq	Abortion	High	ns	ns	ns	ns
		Low	7	0.03	19.19	0.008
	Immigration	High	5	0.02	15.47	0.009
		Low	5	0.51	14.37	0.013
	Energy	High	ns	ns	ns	ns
		Low	6	0.63	17.26	0.008
	Tax	High	7	0.35	31.27	0.001
		Low	6	0.26	13.15	0.041

Table 4.5 presents the comparison of Granger causality tests of the high and low knowledge groups. Unlike for the main priming effects, the results show a mixed picture, although they generally support the hypothesis. Out of the 10 relationships examined, seven results supported, two were neutral regarding, and one did not support, H4. In the relationships between energy → economy, energy → Iraq, energy → immigration, energy → tax, Iraq → abortion, Iraq → energy, Iraq → Tax, the low-knowledge group was more susceptible. That is, they showed Granger causality while the high-knowledge group did not, or their time-lag was shorter than the high-knowledge group. As for the relationships of energy → abortion and Iraq → immigration, there were no differences between the high- and low-knowledge groups.

However, for the relationship of energy → economy, the time-lag of the high-knowledge group (5 days) was shorter than that of the low-knowledge group (7 days).

## ATTRIBUTE PRIMING

### Description of the Period and Attributes

In this dissertation, I explore the main priming effects, the hydraulic pattern of priming, and the impact of political knowledge on the attribute priming effects. In the analysis of attribute priming, the relationships between media coverage and the perceived weights of six candidate attributes (experience, strong leader, judgment, trustworthy, shares value, and too old) were analyzed. The chosen study interval was the 128-day period from May 3<sup>rd</sup> to September 7<sup>th</sup> of 2008.

Table 4.6 Descriptive Statistics of Media Coverage and Attribute Weights

	Mean	Min	Max	SD	N
Attribute Weight					
Experience	0.71	0.44	0.97	0.097	127
Judgment	0.75	0.51	0.99	0.083	127
Strong leader	0.75	0.48	1.02	0.087	127
Trustworthy	0.75	0.42	0.99	0.094	127
Share values	0.76	0.49	1.02	0.091	127
Too old	2.56	-1.24	6.50	1.22	127
Media Coverage					
Experience	0.83	0	4	1.04	128
Judgment	0.73	0	4	1.03	128
Strong leader	0.29	0	3	0.62	128
Trustworthy	0.84	0	4	1.12	128
Share values	0.62	0	6	0.86	128
Too old	0.59	0	4	0.98	128

Table 4.6 shows the descriptive statistics of media coverage and issue weights. As with the issue priming, this period was selected because multiple attributes were covered, with dynamic changes in coverage over time.

What is distinctive about the attributes in political campaigns is that the literature (e.g., Kinder, Peters, Abeison, & Fiske, 1980) often categorized attributes into two groups: performance

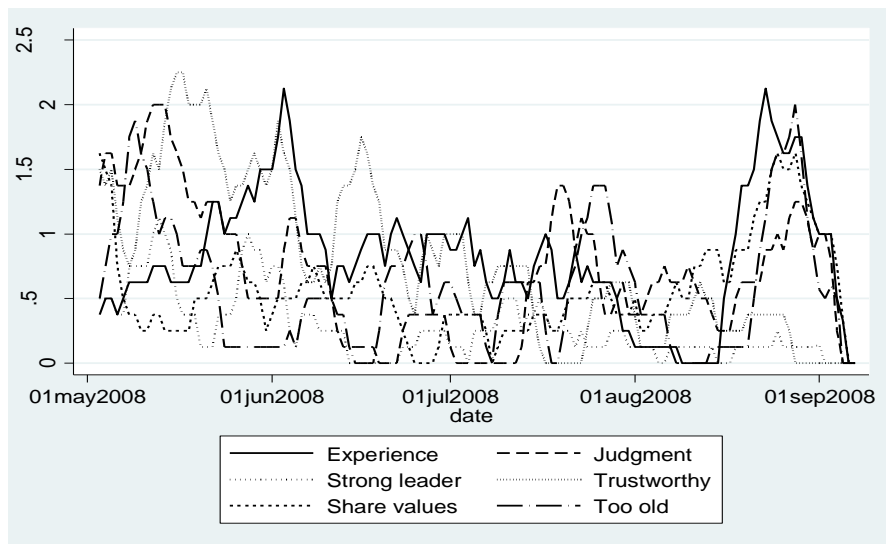
related and personality related. Based on the literature, for this work, six attributes were categorized into two groups: performance (experience, strong leader, judgment), and personality (trustworthy, share value, too old). Each group was actively covered during the period of analysis. Figure 4.3 shows the trends of media coverage.

Among the personality-related attributes, the trustworthy attribute ( $M = 0.84$ ,  $Max = 4$  per day) was covered frequently in late May, whereas among the performance-related attributes, experience ( $M = 0.83$ ,  $Max = 4$ ) was frequently covered in late August.

As for attribute weights, age factor, which was tapped by asking “Do you think McCain is too old to be president?” had the largest weight on average ( $M = 2.56$ ,  $SD = 1.22$ ). Other attribute weights were in the range 0.71 to 0.76, with standard deviations from 0.083 to 0.097.

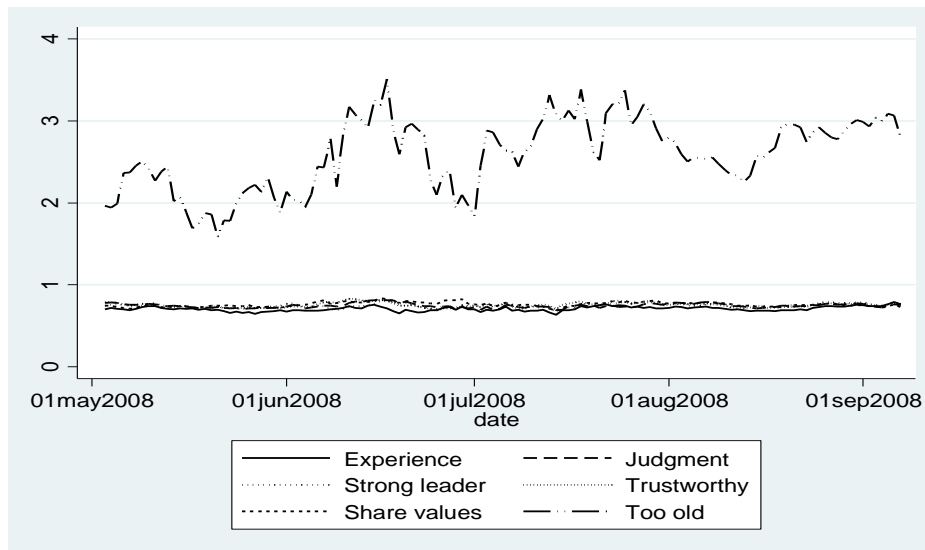
Figure 4.3 shows the trends of media coverage, and Figure 4.4 shows the trends of attribute weights during the study period.

Figure 4.3 Trends of Media Coverage



*Notes* Y: value of unstandardized regression coefficients. Variables are smoothed out by 7-day center moving averages.

Figure 4.4 Trends of Attribute Weights



*Notes* Y: value of unstandardized regression coefficients. Variables are smoothed out by 7-day center moving averages.

### Main Priming Effects (H3, RQ3)

H3 predicted that media coverage of an attribute will change the weight (importance) of that attribute for popular evaluation of political candidates. Table 4.7 represents the Granger causality tests of the six pairs of attribute-coverage and attribute-weight. All in all, the result is in support of the hypothesis. In all attributes but strong leadership, the media coverage Granger-caused the perceived importance of attributes. As with issue priming, the candidate attributes are primed by media in political campaigns. The non-significant result of one attribute is interpreted as being due to low intensity of media coverage. Strong leadership was covered with only about one third the frequency ( $M = 0.29$ ) of other attributes.

RQ3 asked about the optimal time-lag of attribute priming. Compared to the time-lag of issue priming, which settled in the range of 7–8 days, the difference among attributes in the VAR analysis were large, ranging from 4 days (Too old) to 9 days (Trustworthy). Since the length of lags did not correspond to the intensity of coverage, it could be presumed that the difference is caused by the inherent characteristic of these attributes.

Table 4.7 Granger Causality Test for Main Priming Effect

Media coverage	Issue	Optimal lag	Coefficient	Chi square	P value
Experience	Experience	6	0.58	15.81	0.043
Judgment	Judgment	5	-0.86	12.82	0.025
Strong leader	Strong leader	ns	ns	ns	ns
Trustworthy	Trustworthy	9	0.71	24.84	0.005
Shares values	Shares values	6	0.68	12.68	0.048
Too old	Too old	4	-0.08	11.32	0.023

### Hydraulic Pattern Effects (H4, RQ4)

H4 predicted the hydraulic pattern of attribute priming. Because experience and trustworthy are the attributes most frequently covered in the media during this period, and because each attribute represents the category of either performance or personality, this

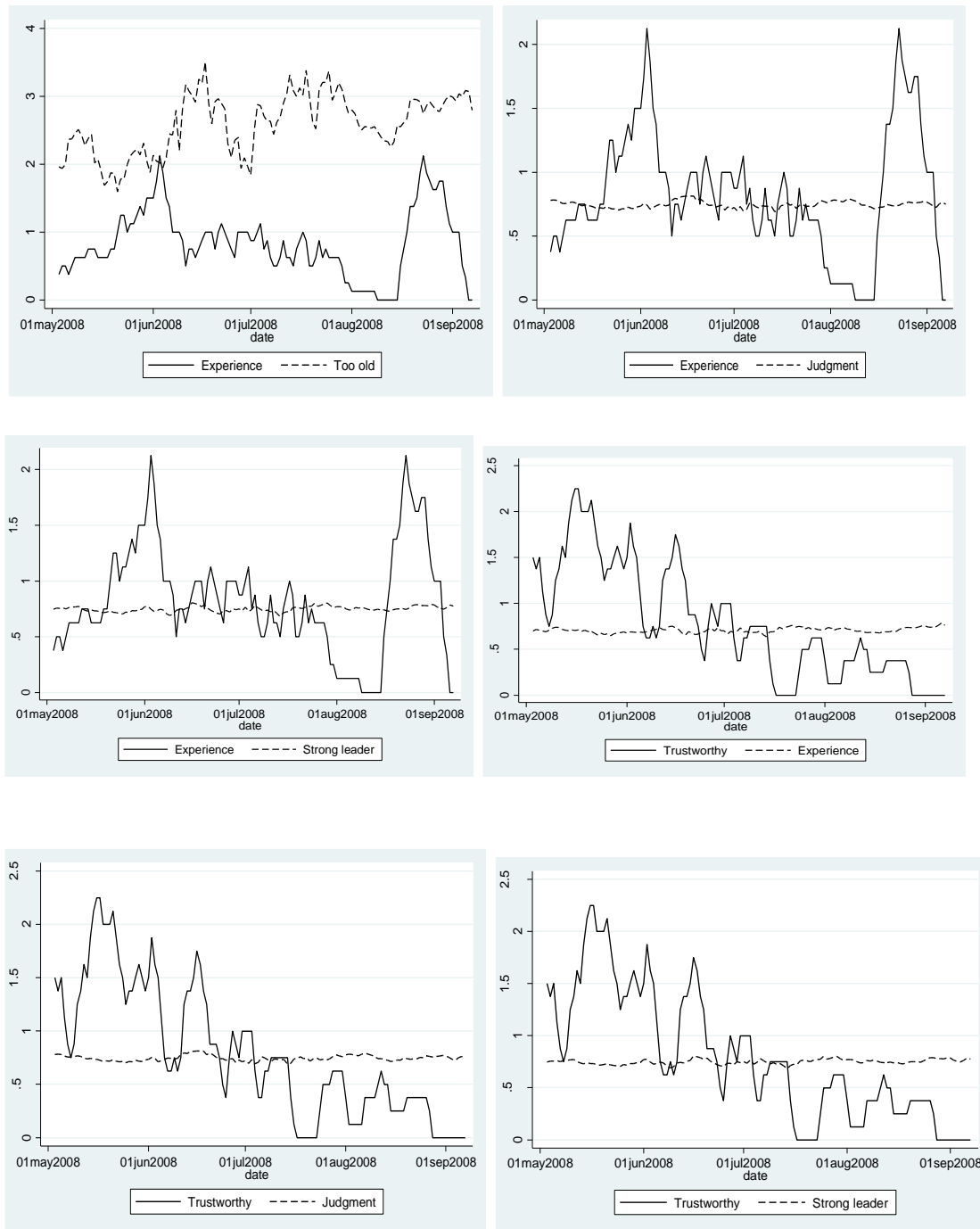
hypothesis was examined by looking into the relationship of these two attributes with the other attributes. Table 4.8 shows the results of the Granger causality tests. Among the 10 relationships examined, six showed significant Granger causality, but four turned out non-significant. With almost half of the relationships failing to establish causality, the hypothesis is partially supported.

RQ4 asked about the optimal time-lag of the hydraulic pattern in attribute priming. The results show that the difference among the attributes is large, ranging from 3 days (judgment) to 9 days (too old). Unlike the results of issue priming, it is difficult to specify the optimal time-lag of the hydraulic pattern with a larger range. Comparison with the time-lag of the main priming effects (3–9 days) was not possible.

Table 4.8 Granger Causality Test for Hydraulic Pattern Effect

Media coverage	Attributes	Optimal lag	Coefficient	Chi square	P value
Experience	Trustworthy	ns	ns	ns	ns
	Shares values	ns	ns	ns	ns
	Too old	9	3.14	18.48	0.030
	Judgment	7	1.97	12.83	0.008
Trustworthy	Strong leader	6	-3.14	16.07	0.013
	Shares values	ns	ns	ns	ns
	Too old	ns	ns	ns	ns
	Experience	4	-1.01	15.76	0.002
	Judgment	3	-0.15	9.15	0.027
	Strong leader	6	2.23	11.59	0.009

Figure 4.3 Graphs of Hydraulic Relationships



*Notes* Y: articles per day. Solid line is media coverage, dash line is issue weight. Variables are smoothed out by 7-day center moving averages. Statistical analysis is administered by differenced values.

## Impact of Political Knowledge

### *Main Priming Effects (H7)*

H7 posits that people with high political knowledge are more susceptible to the attribute priming effects in political campaigns. Table 4.9 shows the results of Granger causality tests and comparison between high- and low-knowledge groups. Overall, the result supported the hypotheses. As with issue priming, the time-lag for the main priming effects was shorter for the high-knowledge group. As for experience (5–7 days), trustworthy (6–9 days), and share values (6–7 days), the lag was shorter for the high-knowledge group, was similar for judgment, and was non-significant for the others. Unlike for issue priming, however, there was no case in which one group's causality was significant while the other group was not.

Table 4.9 Granger Causality Test for Main Priming Effects of High and Low Political Knowledge Groups

Media	Issue	Knowledge	Optimal lag	Coefficient	Chi square	P value
Experience	Experience	High	5	-0.47	14.54	0.001
		Low	7	-0.25	17.33	0.019
Judgment	Judgment	High	5	-0.20	16.78	0.019
		Low	5	0.07	14.19	0.004
Strong leader	Strong leader	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
Trustworthy	Trustworthy	High	6	0.05	12.08	0.001
		Low	9	0.27	16.49	0.036
Shares values	Shares values	High	6	0.45	10.15	0.014
		Low	7	-0.27	16.92	0.003
Too old	Too old	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns



### ***Hydraulic Pattern Effects (H8, RQ5)***

H8 posits that people with low political knowledge are more susceptible to the hydraulic pattern of attribute-priming effects in political campaigns.

Table 4.10 shows the results of the Granger causality tests and comparison between high- and low-knowledge groups. Of the 10 relationships examined, five showed the low-knowledge group to be more susceptible (supported H8), five were neutral and one did not support H8 (turned out opposite). In the relationships of experience to too old, the low-knowledge group showed Granger causality while the high-knowledge group did not. In the relationship of experience → judgment, trustworthy → judgment, trustworthy → strong leader, the time-lag of the low-knowledge group was shorter than that of the high-knowledge group. However, in the relationship of trustworthy → experience, the lag of the low-knowledge group was longer. The media coverage of trustworthy was among the most frequent ( $M = 0.84$ ). Also, in four pairs of relationships, Granger causality results were non-significant. With only half of the results in support, it is difficult to conclude that H8 is supported overall.

Turning to RQ5, the results suggests a difference in the susceptibility between personality and performance attributes. There was no noticeable difference in the main priming effects. In the hydraulic pattern, the results show that personality attributes (trustworthy, share values, too old) exhibited less effect from the hydraulic pattern than did performance attributes (experience, judgment, strong leader). The weights of personality attributes were not influenced by the media coverage of either trustworthy (personality) or experience (performance) attributes, except for the relationship of experience → too old. On the other hand, all five Granger-causality tests with performance attributes as dependent variables, were significant.

Table 4.10 Granger Causality Test for Hydraulic Pattern Effects of High and Low Political Knowledge Groups

Media coverage	Issue	Knowledge	Optimal lag	Coefficient	Chi square	P value
Experience	Trustworthy	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
	Shares values	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
	Too old	High	ns	ns	ns	ns
		Low	8	0.26	13.59	0.047
	Judgment	High	8	-0.18	14.79	0.048
		Low	7	-0.19	15.27	0.014
	Strong leader	High	6	-0.57	16.23	0.002
		Low	5	-0.77	18.50	0.001
Trustworthy	Shares values	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
	Too old	High	ns	ns	ns	ns
		Low	ns	ns	ns	ns
	Experience	High	4	-0.39	20.27	0.009
		Low	5	-0.57	18.40	0.012
	Judgment	High	5	-0.72	17.24	0.007
		Low	3	-0.69	12.56	0.005
	Strong leader	High	8	-0.29	17.54	0.025
		Low	4	0.18	14.68	0.005

## SUMMARY OF RESULTS

The results provide a comprehensive depiction of the media priming effects that occur in political campaigns. The summary of results from all the hypotheses and research questions are presented in Table 4.11.

The causal relationship between media coverage and issue weight was established, both for the main priming effects and for the hydraulic pattern. That is, media coverage of a certain issue influences the importance of that issue, as well as the importance of other issues.

Examination of the time-lags generated in this study offers insights different from those reported in previous studies of priming. At the aggregate level, the main effect of issue priming was

established to have a lag of 7–8 days. This represents a statistically optimal causality between media coverage and issue weight, in a context where news about issues evolves and is repeated, even as the short-term effect of priming fades away and disappears.

The time-lag of the hydraulic pattern was shorter than that of the main priming effects. This is noteworthy because in a short-term study design, the lag would be shorter for the main priming than the hydraulic pattern, or the two effects may happen simultaneously.

Political knowledge had a positive impact on the main priming effects. The results show that priming effects are facilitated by political knowledge. For the hydraulic pattern, the direction was opposite. The low-knowledge group was more susceptible. The impact of issue characteristic was hardly detected except in the time-lag of the abortion issue. In all other cases of issue priming, the range of time-lags was within a short span overall.

As for attribute priming, the result was in parallel overall, but less clear. The main effect of priming was supported as with issue priming. However, as for the hydraulic pattern, the results were less consistent. Especially the personality-related attributes were resistant to the hydraulic pattern effects whereas performance-related attributes were susceptible. In other words, the importance of personality attributes did not change with the news coverage of other attributes. That political knowledge had a positive impact on the main effects of attribute priming, was also positive. However, its impact on the hydraulic pattern was not conclusive.

The optimal time-lag of the main effects of attribute priming ranged from 4 to 9 days. The hydraulic pattern ranged from 3 to 9 days. The comparison between the two was not meaningful.

In the examination of the issue characteristics, only the typology of obtrusiveness had a meaningful result. This study attempted to apply the typology of new vs. old, easy vs. hard issues

in the literature and examine the impact on the hydraulic pattern of priming effects, by looking into the context of coverage about energy and Iraq issues. But the results were not distinguishable.

Table 4.11 Summary of Results of Hypotheses and Research Questions

<i>Hypotheses and Research Questions</i>	<i>Results</i>
H1: The Granger causality of issue priming, main effect	Supported
H2: The Granger causality of issue priming, hydraulic pattern	Supported
RQ1: The optimal time-lag of issue priming, main effects	7–8 days
RQ2: The optimal time-lag of issue priming, hydraulic effects	5–6 days
H3: The Granger causality of attribute priming, main effect	Supported
H4: The Granger causality of attribute priming, hydraulic pattern	Partially supported
RQ3: The optimal time-lag of attribute priming, main effects	4–9 days
RQ4: The optimal time-lag of attribute priming, hydraulic effects	3–9 days
H5: Those with high knowledge are more susceptible, issue priming, main effects	Supported
H6: Those with low knowledge are more susceptible, issue priming, hydraulic effects	Supported
H7: Those with high knowledge are more susceptible, attribute priming, main effects	Supported
H8: Those with low knowledge are more susceptible, attribute priming, hydraulic effects	Not supported
RQ5: Influence of attribute categories (personality and performance)	Performance is more susceptible
H9a: Hydraulic pattern is more prominent for news issues	Not supported
H9b: Hydraulic pattern is more prominent for unobtrusive issues	Supported
H9c: Hydraulic pattern is more prominent for hard issues	Not supported
H9d: Hydraulic pattern is less prominent for economic issues	Partially supported

## Chapter 5: Discussion

This dissertation involved a study design focused on long-term aggregate-level effects of media priming. It was used to investigate the hydraulic pattern of media priming effects by looking into Granger causality between media coverage and the importance of issues people perceive. In other words, it was used to determine whether intense coverage of one issue changes popular perception about the importance of other issues. For that purpose, the relationships between time-series variables involving six issues, and weight variables involving six candidate attributes, were tested using media coverage data. Also, and for the first time, the optimal time-lag determined by Vector auto-regression (VAR) was used to gauge the time span between media coverage and priming effects.

By doing so, it was possible to test the direct influence of media coverage in a setting where media messages are streamed continuously. Thus, these findings provide insights into the nature of priming effects to fill the gaps left by previous studies that focused on short-term, one-shot, individual-level effects. First, testing over a longer period than in previous studies, allowed the finding that the hydraulic pattern of effects precede the main effects of priming. It was also found that political knowledge works in different directions: exerting positive moderation on the main priming effects, but negative moderation on the hydraulic pattern. This finding implies an unequal influence of media. Being primed away from certain issues, the less knowledgeable are vulnerable to the blindfolding effects of the media, while the knowledgeable are not.

Methodologically, the present research is an attempt to supplement the literature that has focused on individual-level effects of priming.

## SEPARATING TWO KINDS OF PRIMING EFFECTS WITH TIME

One of the key contributions of this dissertation is that it separated the hydraulic pattern and the main effects of priming, and analyzed them as a sequential process. Time was a key factor in distinguishing the two effects and interpreting the results in this investigation. Since the theory was introduced to the study of political communication, researchers of priming effects have been confronted with a number of theoretical conundrums, confusion over the susceptibility to priming effects and about the underlying mechanisms of the effects. This dissertation demonstrates that solving these problems depends on how one incorporates time into the analytical model. Drawing from arguments that there are two different kinds of priming effects, hypotheses were posited that as messages are repeated over time, priming effects will evolve from an automatic type to a more deliberative type.

Testing these hypotheses requires a measurement of time that is flexible and which can encompass longer trends. Scholars have taken steps to develop a measure to examine the role time plays in priming effects; however, most designs did not overcome the limitation of short-lived effects. The time-lags found in this research differ conceptually from the time spans found in previous studies. For example, one result here was that the time-lag is 7 to 8 days for the main effects of issue priming. This means the causality between media coverage and priming effects is best established, with that time span, in a stream of continuous communication. On the other hand, when Carpenter and colleagues (2008) found priming effects to last less than a day, it measured one-shot effects with the dimension of durability.

In reality, political priming is a dynamic process in which different messages compete to influence the public during campaigns that may last for years. Political issues may be debated for weeks and months. It may be true that the public is forgetful and that the news cycle has been

shortened to less than 24 hours; but it is also true that news is repeated and that it evolves with addition of new facts every day. New inputs of messages are provided even before we forget the old inputs. As the stimuli are repeated, the mechanism underlying the effects of media is submitted to qualitative change. The change may involve a conversion from the effects of temporal accessibility to chronic accessibility, applicability or learning that lasts for a longer time. The effects social scientists should be concerned about, and the effects that are consequential to the outcome of campaigns, are not the daily fluctuation of memories but the cumulative effects that last.

The results of this study demonstrated that the hydraulic pattern of effects precedes the main priming effects of priming. This finding is noteworthy because in a one-shot study, the result would have been the opposite, or would have appeared in the same time point, because in essence, the hydraulic pattern effect accompanies the main effect.

However, in a dynamic process of cumulative effects where stimuli are repeated and effects appear and fade away, the hydraulic pattern effects can precede the main effects. Extending the individual-level explanation of the dual-process approach of priming, the results suggest that two different types of media effects have happened. The automatic type of priming, with which the hydraulic pattern of effects are included, have a shorter time-lag. However, the best causality is established for the main priming effects, which take longer. These are the effects scholars (Althaus & Kim, 2006; Takeshita, 2006) described as more conscious and deliberative effects, compared to those that have shorter time-lags. Thus, based on the results of this dissertation, one can think of a sequential process in public opinion in which ephemeral effects are accumulated to change the importance of an issue.

Experimental designs have become more realistic by taking into account the elapse of time. However, with a research design measuring only one or two days, it would be difficult to determine how long-term effects of political priming are different from the short-term effects. Studies relying on the duration dimension of time measurement will be restricted to capturing the ephemeral quality of priming (Chong & Druckman, 2010).

Imagine how existing knowledge influence the way we absorb information from the media. It is argued that for those with more knowledge, the priming effects last longer (Togeby, 2007). But durability is just one aspect of influence. The more knowledge one has about a domain, the more quickly one can make sense of new information and find an appropriate use for it (Fiske & Taylor, 1991). The optimal time-lag used in this study was intended to take into account the susceptibility dimension, as well as the durability dimension, of time. As defined, Granger causality reflects the cumulative effect of all the time-lags within the time-span selected.

The results of the present research show that the time-lag of priming effects changes as the strength of the effect changes. Thus, to capture the priming effects comprehensively, the measurement of time-lag should be flexible. The optimal time-lag has merit over previous measurements in this regard also. Many studies of media effects that used a fixed time-span might have underestimated the extensiveness of the effects because they failed to capture the full effects. For example, Malholtra and Krosnick (2007) examined the correlation between the frequency of news about an issue and perceived issue-weights with the fixed lag of one week. Many of the relationships was statistically non-significant. This result might be due to the fact that the time-lag of effects varied as the intensity of the news coverage changed, as is now known from the results of the present study.



By applying flexible time-lags depending on the issues, this study established causality in the hydraulic pattern of priming in most of the cases considered. In other words, the media coverage of one issue, or of one candidate-attribute, causes the weight of other issues and attributes to change.

As for issue priming, the results show that the time-lag of main effects is 7 to 8 days. This length of time is longer than the findings of previous studies. Media-effect research that utilized time-series variables, selected 1–4 day time-lag and found significant relationships different from the previous research on media effects that utilized only time-series analysis in which 1–4 day time-lag was selected (Rogers, Dearing, and Chang, 1991; Liu, Lindquist, & Vedlitz, 2011). It is probably due to the nature of the dependent variable of this study, issue/attribute weight. Compared to outcome variables such as MIP rank order, or number of publications about an issue, issue/attribute weight would be less responsive to media coverage, because it has been controlled for demographics, political orientation and news use.

As for attribute priming, the time-lag of the main priming effect varied from 4–9 days. Overall, the effect seemed to be weaker in attribute priming than in issue priming. All the weights except for ‘too old’ were in the range of 0.70–0.80 with little variance throughout the period analyzed. Especially, the personality-related attributes such as ‘trustworthy’ were resistant to media influence. Relying on Carmine and Stimson’s typology of hard and easy issues (1980), it could be that the importance of personality attributes is so ingrained over a long period in the public mind that it is immune to media influence. As the prototype of a presidential study (Kinder et al., 1980) shows, the public has a fixed priority about the importance of personality attributes when evaluating presidential candidates, which will not be easily influenced by media coverage. For example, the importance of trustworthiness of a president will not become more

important or less important from media influence. In that context, the variable of attribute weight might not be an appropriate measure when examining the media effect on candidate's attributes.

### **THE NATURE OF PRIMING AND VULNERABLE CITIZENS**

The findings of this dissertation imply that the priming effects are positively related with political knowledge overall. In the argument about the two kinds of priming, the long-term effects are described as deliberative and reflective (Takeshita, 2006), or as active (Kim, 2006). The positive impact of political knowledge on the main priming effect suggests that it is not an automatic and unreflective process as argued in cognitive psychology.

It may be true that like other types of media effects, priming is related to the problem of information overload. As Miller and Krosnick (1996) explained, the hydraulic pattern of priming will show as long as “people have neither the ability nor the motivation to comprehensively incorporate every potentially relevant issue into their presidential evaluations” (p. 82). This does not mean, however, that media influence is realized automatically. Especially for effects like priming and agenda setting, which influence the standards of behavior, it is likely that there is a grey area in our mental filing system that may fall short of complex internal information processing, and yet, for which a certain degree of cognitive involvement is needed (Evans, 2008; Sniderman, Brody, & Tetlock, 1991). In other words, priming may be a semi-deliberative process.

This argument is in parallel with the findings of a cognitive shortcut of information processing. People often use heuristics to make a political decision without processing all the information about it. However, this does not mean that cognitive ability or motivation is irrelevant. Lau and Redlawsk (2001) found that a certain amount of political knowledge is needed to take advantage of heuristics. They conclude, “Ironically, heuristics are most valuable

to those who might in fact need them least. Sophisticated voters, who understand the political environment, can use these shortcuts to their advantage” (pp.26-27).

The findings of this dissertation point to a similar inference. The knowledgeable are more susceptible to the main priming effects. The vulnerable-citizen model does not hold for the main priming effects. The process by which the public adopts a system of issue-importance and candidate-evaluation may be a conscious and active process that needs some time to be established.

On the other hand, the low-knowledge group is more susceptible to the hydraulic pattern of effects. That is, when media floods them with news, the less knowledgeable may lose sight of other issues while the knowledgeable do not. This finding is similar to the study of Togeby (2007) that the knowledgeable were able to expand the number of issues they consider for political decisions.

Overall, the results of this dissertation suggest that the public is hardly a victim of priming effects. The process of priming effects takes some time and a certain level of cognitive processing. Studies from the media malaise perspective have assumed that the knowledgeable, because of consistent preexisting attitudes, are less vulnerable to the media priming while the less knowledgeable segment of population is easily manipulated (Iyengar et al., 1984). These findings reject this black and white claim.

However, the results from this work strongly points to the problem of inequality. Even at the aggregate level, two kinds of priming effects on the public is discernable. As for the hydraulic pattern of effects, this study showed that the low-knowledgeable group is more susceptible. With these patterns of effects taken into consideration, the vulnerability of the less knowledgeable should still be of concern.

Although with caution, these results can be explained by individual-level theories. As the literature posits frequent primes can gradually increase the applicability of a construct (Althaus & Kim, 2006; Price and Tewksbury, 1997), or instigate the goal to learn about candidates (Lenz, 2009). The results imply that there may be inequality in the process, and that cognitive ability conditions how the accessibility-effects convert to applicability or learning.

#### **AGGREGATE VS. INDIVIDUAL LEVEL ANALYSIS**

Methodologically, this dissertation departs from previous studies in the conversion of issue/attribute weight variables into aggregate-level dependent variables. The priming effect is the influence of media coverage on popular perceptions. The intensity of media coverage, whether measured by number of articles or words, is at the aggregate level, whereas the perceived importance of issues is at the individual level. A traditional way of resolving the level of analysis problem in priming research, has been to adjust the level of the media coverage. Various methods have been effectively employed in the literature. In one study, the researcher created an individual-level variable measuring the difference of issue ranks between the population and the respondent (Ha, 2012). Some studies included individual-level variables such as media-use and news-attention instead of investigating the link between the media coverage and issue-weight (Druckman, 2004). Other studies used the media-coverage data as circumstantial evidence that media coverage influenced individual-level perceptions (Kim, 2005; Krosnick & Kinder, 1990.).

In contrast, in this dissertation the level of issue or attribute weight-issue was adjusted to match the media-coverage variables. By doing so, the direct link between the time-series variables of media coverage and the issue/attribute weights was examined to establish causality. Findings about the difference between the hydraulic and the main priming effects, or the

relationship between political knowledge and susceptibility, were made possible by this methodology. The individual-level variables were included in the regression model that produced issue/attribute weights. A variety of individual variables, ranging across political orientation (ideology, partisanship), media use (newspaper, television, online news) and demographics (age, gender, race, education, income) were reflected in the analysis. All in all, this dissertation was able to provide new insight into the areas that previous studies had left with unclear conclusions, such as the nature of the hydraulic pattern, the impact of time on priming effects and susceptibility to effects.

However, I argue that the level of analysis is a question of trade-off, rather than of a question of superiority. In other words, aggregate level analysis can supplement what individual level analysis has achieved, but cannot substitute the methods as a whole. The reverse is also true. Weakness of one is the strength of the other.

The strength of priming theory has been hitherto argued based on individual-level findings. For example, Kinder and Krosnick (1990) indicated the strength of priming research is “to examine processes of change in popular support for a president at the level of individual citizen, with the goal of informing and enriching aggregate studies of presidential popularity” (pp. 497-498). They pointed out that the time-series work about the president’s popularity makes “analytically convenient but highly unrealistic claim of homogeneity (that all citizens react in exactly the same way)” (p.497). And in general, the interpretation of aggregate-level results is hard to be free from ecological fallacy (Robinson, 1950) or aggregation bias (Langbein & Lichtman, 1978).

To reduce the danger of assuming homogeneity, in this dissertation, I attempted to consider as many individual-level variables as possible in extracting the variable issue-weight.

Thus, I believe the variables of issue/attribute weight tap relatively pure impact on changing popular perception about the importance of issues and attributes, controlling for individual differences about political orientations, news use and demographics. In addition, the dependent variable used in this dissertation has an advantage over macro-level measurements because it is linked to the evaluation of political figures. For example, voters may highly commend the president's performance on the Gulf War, but at the polls, vote based on the performance of economy. On the other hand, the issue-weight measures the slope in the relationship between issues and political evaluation.

All this notwithstanding, this dissertation is not free from the overall vulnerability of aggregate-level studies. It stands on more restrictive assumptions and the findings require cautious interpretation. In short, this study is based on the assumption that the change of individual behaviors entails the change of popular political trends, which means that the results require cautious interpretation. Like other time-series studies, this one assumes that the strength and direction of media influence is more or less the same at the aggregate and the individual levels. Also, it is assumed that psychological mechanisms that operate at the individual level (i.e., accessibility, applicability learning, or the dual process of information processing) also operate at the aggregate level. These assumptions are restrictive, but not false (Willnut & Zhu, 1996). The major merits of aggregate-level analysis, such as detecting effects across a longer trend of time, are enough to justify the application of these methods.

Despite its contributions, this dissertation has a number of limitations that need to be stated. First, concentrating on the bivariate relationship between media coverage and issue/attribute weights, this research did not have a strategy to examine mediation analysis. Therefore, the question of how the priming effects happen at specific stages of time remains

largely unanswered. In other words, although the findings demonstrate that priming effects change over time, we do not understand which effects are based on applicability, chronic accessibility or learning. It also remains unclear whether chronic accessibility evolves into applicability or learning.

Based on the literature, this dissertation included arguments that the two kinds of priming are linked as a sequential process, and that the path from automatic to deliberate information processing is linear (Buklow et al., 2013; Roskos-Ewoldsen et al., 2009; Price & Tewksbury, 1997). For example, accessibility effects evolve into applicability effects. However, without the full knowledge of how this change of effects occurs, it cannot be fully excluded that the two kinds of priming co-exist separately. Evans (2008) argued in his study about social cognition, that two kinds of information processing coexist in the human cognitive system. System 1 involves a process that is unconscious, rapid, automatic, while System 2 is a conscious, slow and deliberative process that coexists, and responds differently to the same stimuli.

A second limitation is the media-coverage variable. The present study adopted the frequency of news with article as the unit of analysis. The variable does not include measurement of valence or tone of message. It is probable that the relatively weaker causality in the attribute priming is due to this limitation of measurement. Unlike for issue priming, the importance of candidate attributes, especially personality attributes, are more susceptible to the tone of the message. Therefore, it may be necessary to apply different measurements for issue-priming and attribute-priming effects.

Third, the direction and intensity of the hydraulic pattern should be measured in future studies. Like the theory of substitute and complementary goods in economics, the effects of hydraulic patterns could appear differently. A sophisticated scale to capture the direction and

proximity of the relationships among issues will greatly advance understanding of the hydraulic pattern.

Fourth, the examination of the impact of issue characteristic on hydraulic pattern of priming did not produce meaningful results because the range of issues examined was not extensive enough. Capturing issue specific differences is one of the most difficult tasks of media effect studies. It may require a creation of ordinal scale taking into account the dynamic context of the debated issues.

Notwithstanding the limitations, the methodological strength of this dissertation has allowed it to fill the gaps of previous studies of priming. The hydraulic pattern of priming effects has been accepted as its nature. But rarely has it been separated from the main effects of priming and examined. By establishing causality with media coverage and clarifying conditions of hydraulic pattern of effects, this dissertation was able to present a better explanation of the priming effects overall.



### Appendix: codebook

Variable	Label and codes	Description	
V1	Coder ID	1-4	
V2	Media/Outlet 1. ABC 2. New York Times 3. FOX		
V3	Story ID	Beginning with 0001, assign 4 digit number	
V4	Date	Code year, month, date as a number Ex) 20080119, 20071217	
Issue			
V5	Economy_ National	Macro index. Wall street. Objective assessment of economy.	
V6	Economy _Personal	Living standard. Subjective assessments. Tax issues should not be included. But if it relates to personal economy, include it.	
V7	Tax		
V8	Trade	Include bilateral and multilateral exports and imports.	
V9	Financial Crisis	This refers to Wall street meltdown. Can be double-checked with economy-national.	
V10	Health care		
V11	Foreign affairs-commander in chief	Foreign issues related to military, security & power. Include terrorism issues.	
V12	Foreign affairs-diplomacy	Foreign issues related to diplomacy, friendship & negotiation.	
V13	Iraq		
V14	Immigration		
V 15	Abortion		
V16	Gay rights		
V17	Energy		
V18	Environment		
Attribute			

V19	Ideology	Conservative, liberal, re-distribution, socialist	
V20	Strong leader	Take word as it is.	
V21	Trustworthy	Speaking the truth but by living his life in a genuine and authentic way. Down to earth and without pretense	
V22	Experience	Take word as it is.	
V23	Judgment	Thinking things through and examining them from all sides. He does not jump to conclusions, and he relies only on solid evidence to make his decisions. He is able to change his mind. For example, McCain's erratic temper.	
V24	Ready to be president	Do not generalize this term. Has to deal with specific qualification or experience.	
V25	Patriotic	Has to deal with determination, sentiment or affection towards the state, not ideology or people.	
V26	Shares my values	Represents specific sectors of the public. E.g., young voters identify with Obama.	
V27	Too old	For example, McCain's health problem.	
V28	Too young	Mostly dealt in McCain's counter attack of age issue.	

## References

- Albertson, B., & Lawrence, A. (2009). After the Credits Roll: The Long-Term Effects of Educational Television on Public Knowledge and Attitudes. *American Politics Research*, 37(2), 275-300.
- Althaus, S. L., & Kim, Y. (2006). Priming effects in complex information environments: Reassessing the impact of news discourse on presidential approval. *The Journal of Politics*, 68(04), 960-976.
- Anderson, C. J. (2007). The end of economic voting? Contingency dilemmas and the limits of democratic accountability.
- Arendt, F. (2013a). Toward a dose-response account of media priming. *Communication Research*, Online first, 0093650213482970.
- Arendt, F. (2013b). News stereotypes, time, and fading priming effects. *Journalism & Mass Communication Quarterly*, 90(2), 347-362.
- Balmas, M., & Sheafer, T. (2010). Candidate image in election campaigns: Attribute agenda setting, affective priming, and voting intentions. *International Journal of Public Opinion Research*, 22(2), 204.
- Bandura, A., & McClelland, D. C. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bannon, B., Krosnick, J. A., & Brannon, L. (2006). *News media priming: Derivation or Rationalization*.
- Bassili, J. N., & Racine, J. P. (1990). On the process relationship between person and situation judgments in attribution. *Journal of Personality and Social Psychology*, 59(5), 881.
- Berelson, B., Lazarsfeld, P., & McPhee, W. (1954) *Voting*. Chicago. IL: University of Chicago Press.
- Bimber, B., Brundidge, J., Conroy, M., & Lively, E. (2013). Issue comparisons and ordinal priming. *International Journal of Communication (19328036)*, 7.
- Bishin, B. G., Stevens, D., & Wilson, C. (2006). Character counts? Honesty and fairness in election 2000. *Public Opinion Quarterly*, 70(2), 235-248.
- Brosius, H. B., & Weimann, G. (1991). The contagiousness of mass-mediated terrorism. *European Journal of Communication*, 6(1), 63-75.

- Brians, C. L., & Wattenberg, M. P. (1996). Campaign issue knowledge and salience: Comparing reception from TV commercials, TV news and newspapers. *American Journal of Political Science*, 172–193.
- Brosius, H. B., & Weimann, G. (1996). Who sets the agenda agenda-setting as a two-step flow. *Communication Research*, 23(5), 561-580.
- Bulkow, K., Urban, J., & Schweiger, W. (2012). The Duality of Agenda-Setting: The Role of Information Processing. *International Journal of Public Opinion Research*, 25(1), 43–63. doi:10.1093/ijpor/eds003
- Burrell, Mike Allen, and Jennings Bryant (Mahwah, NJ: Lawrence Erlbaum, 2007), 53-80.
- Cappella, J. N., & Jamieson, K. H. (1997). *Spiral of cynicism: The press and the public good*. New York: Oxford University Press.
- Carmines, E. G., & Stimson, J. A. (1980). The two faces of issue voting. *The American Political Science Review*, 74(1), 78-91.
- Carpentier, F. R., Roskos-Ewoldsen, D. R., & Roskos-Ewoldsen, B. B. (2008). A test of the network models of political priming. *Media Psychology*, 11(2), 186-206.
- Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). New York: Guilford Press.
- Chong, D., & Druckman, J. N. (2010). Dynamic public opinion: Communication effects over time. *American Political Science Review*, 104(04), 663-680.
- Cho, J. (2005). Media, interpersonal discussion, and electoral choice. *Communication Research*, 32(3), 295.
- Chong, D., & Druckman, J. N. (2010). Dynamic public opinion: Communication effects over time. *American Political Science Review*, 104(4), 663-680.
- Chong, D., & Druckman, J. N. (2009). Dynamics in Mass Communication Effects Research. *The Sage Handbook of Political Communication*. Thousand Oaks, CA: Sage Publications.
- Chong, D., & Druckman, J. N. (2007). A theory of framing and opinion formation in competitive elite environments. *Journal of Communication*, 57(1), 99-118.

- Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, 82(6), 407.
- Converse, P. E. (1964). The nature of belief systems in mass politics. *Ideology and discontent*, 206-261.
- Converse, P. E. (2000). Assessing the capacity of mass electorates. *Annual Review of Political Science*, 3(1), 331-353.
- Damore, D. F. (2004). The dynamics of issue ownership in presidential campaigns. *Political Research Quarterly*, 57(3), 391.
- Delli Carpini, M., & Keeter, S. (1996). *What Americans know about politics and why it matters*.
- Domke, D., Fan, D. P., Fibison, M., Shah, D. V., Smith, S. S., & Watts, M. D. (1997). News media, candidates and issues, and public opinion in the 1996 presidential campaign. *Journalism & Mass Communication Quarterly*, 74(4), 718-737.
- Druckman, J. N., Fein, J., & Leeper, T. J. (2012). A Source of Bias in Public Opinion Stability. *American Political Science Review*, 106(2), 430-454.
- Druckman, J. N. (2004). Priming the vote: Campaign effects in a US Senate election. *Political Psychology*, 577-594.
- Druckman, J. N. & Holmes, J. W. (2004). Does presidential rhetoric matter? Priming and presidential approval. *Presidential Studies Quarterly*, 755-778.
- Druckman, J. N., & Nelson, K. R. (2003). Framing and deliberation: How citizens' conversations limit elite influence. *American Journal of Political Science*, 47(4), 729-745.
- Edwards III, G. C., Mitchell, W., & Welch, R. (1995). Explaining presidential approval: The significance of issue salience. *American Journal of Political Science*, 108-134.
- Evans, J. S. B. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255-278.
- Fazio, R. H. (1995). Attitudes as object-evaluation associations: Determinants, consequences, and correlates of attitude accessibility. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 247-282). Hillsdale, NJ: Lawrence Erlbaum.

- Fazio, R. H., & Williams, C. J. (1986). Attitude accessibility as a moderator of the attitude-perception and attitude-behavior relations: An investigation of the 1984 presidential election. *Journal of Personality and Social Psychology*, 51(3), 505-514.
- Fiorina, M. P. (1981). *Retrospective voting in American national elections*. New Haven, CT: Yale University Press.
- Funk, C. (1996). The impact of scandal on candidate evaluations: An experimental test of the role of candidate traits. *Political Behavior* 18:1-24.
- Funkhouser, G. R. (1973). The issues of the sixties: An exploratory study in the dynamics of public opinion. *Public Opinion Quarterly*, 37(1), 62-75.
- Gans, H. J. (1979). *Deciding what's news: A study of CBS evening news, NBC nightly news, Newsweek, and Time*. Chicago, IL: Northwestern University Press.
- Gelman, A., & King, G. (1993). Why are American presidential election campaign polls so variable when votes are so predictable? *British Journal of Political Science*, 23(4), 409-451.
- Ghanem, S. (1997). Filling in the tapestry: The second level of agenda setting. In M. McCombs, D. Shaw, & D. Weaver (Eds.), *Communication and democracy: Exploring the intellectual frontiers in agenda-setting theory* (pp. 3-14). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Goren, P. (2002). Character weakness, partisan bias, and presidential evaluation. *American Journal of Political Science*, 627-641.
- Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society*, 424-438.
- Groshek, J., & Groshek, M. (2013). Agenda trending: Reciprocity and the predictive capacity of social network sites in intermedia agenda setting across issues over time. *Media and Communication*, 1(1), 15-27.
- Ha, S. (2011). Attribute priming effects and presidential candidate evaluation: The conditionality of political sophistication. *Mass Communication and Society*, 14(3), 315-342.
- Habermas, J. (1991). *The structural transformation of the public sphere: An inquiry into a category of bourgeois society*. The MIT Press.

- Hastie, R., & Park, B. (1986). The relationship between memory and judgment depends on whether the judgment task is memory-based or on-line. *Psychological Review*, 93, 258-268.
- Hechter, M. (2000). *Containing nationalism*. Oxford, UK: Oxford University Press.
- Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. *Social psychology: Handbook of basic principles*, 133-168.
- Higgins, E. T., King, G. A., & Mavin, G. H. (1982). Individual construct accessibility and subjective impressions and recall. *Journal of Personality and Social Psychology*, 43(1), 35.
- Hilgartner, S., & Bosk, C. L. (1988). The rise and fall of social problems: A public arenas model. *American Journal of Sociology*, 94, 53-78.
- Iyengar, S. (1990). Shortcuts to political knowledge: The role of selective attention and accessibility. *Information and democratic processes*, 160-185.
- Iyengar, S., Hahn, K. S., Bonfadelli, H., & Marr, M. (2009). Dark Areas of Ignorance • Revisited. *Communication Research*, 36(3), 341.
- Iyengar, S., & Kinder, D. R. (1987). *News that matters: Agenda-setting and priming in a television age*. Chicago: University of Chicago Press.
- Iyengar, S., & Simon, A. (1993). News coverage of the Gulf crisis and public opinion: A study of agenda-setting, priming, and framing. *Communication Research*, 20(3), 365.
- Iyengar, S., Kinder, D., Peters, M., & Krosnick, J. (1984). The evening news and presidential evaluations. *Journal of Personality and Social Psychology*, 46, 778-787.
- Jenkins, R. W. (1999). How much is too much? Media attention and popular support for an insurgent party. *Political Communication*, 16(4), 429-445.
- Kay, A. C., Shepherd, S., Blatz, C. W., Chua, S. N., & Galinsky, A. D. (2010). For God (or) country: the hydraulic relation between government instability and belief in religious sources of control. *Journal of Personality and Social Psychology*, 99(5), 725-39. doi:10.1037/a0021140
- Kelleher, C. A., & Wolak, J. (2006). Priming presidential approval: The conditionality of issue effects. *Political Behavior*, 28(3), 193-210.

- Kenski, K., Hardy, B. W., & Jamieson, K. H. (2010). *The Obama victory: How media, money, and message shaped the 2008 election*: Oxford Univ Pr on Demand.
- Kenski, K., & Stroud, N. J. (2006). Connections between Internet use and political efficacy, knowledge, and participation. *Journal of Broadcasting & Electronic Media*, 50(2), 173-192.
- Kim, S. H., Han, M., & Scheufele, D. A. (2010). Think about Him This Way: Priming, News Media, and South Koreans' Evaluation of the President. *International Journal of Public Opinion Research*, 22(3), 299.
- Kim, Y. (2005). Use and disuse of contextual primes in dynamic news environments. *Journal of Communication*, 55(4), 737-755.
- Kinder, D. (1986). Presidential character revisited. In R. R. Lau & D. O. Sears (Eds.), *Political cognition*. Hillsdale, NJ: Erlbaum.
- Kinder, D., Peters, M., Abelson, R., & Fiske, S. (1980). Presidential Prototypes. *Political Behavior*, (2), 315-37.
- Krippendorff, K. (2012). *Content analysis: An introduction to its methodology*. London, UK: Sage Publications.
- Krosnick, J. A. (1989). Attitude importance and attitude accessibility. *Personality and Social Psychology Bulletin*, 15(3), 297.
- Krosnick, J. A., & Brannon, L. A. (1993). The impact of the Gulf War on the ingredients of presidential evaluations: Multidimensional effects of political involvement. *American Political Science Review*, 87(4), 963-975.
- Krosnick, J. A., & Kinder, D. R. (1990). Altering the foundations of support for the president through priming. *The American Political Science Review*, 497-512.
- Lang, A., & Ewoldsen, D. (2010). Beyond effects: Conceptualizing communication as dynamic, complex, nonlinear, and fundamental. In S. Allan (Ed.), *Rethinking communication. Keywords in communication research* (pp. 109-120). Cresskill, NJ: Hampton Press.
- Lau, R. R., & Redlawsk, D. P. (2001). Advantages and disadvantages of cognitive heuristics in political decision making. *American Journal of Political Science*, 45(4), 951-971.
- Leary, D. E. (1994). *Metaphors in the History of Psychology* (p. 383). Cambridge University Press. Retrieved from <http://books.google.com/books?hl=en&lr=&id=zsbjc8GRHlwC&pgis=1>



- Lee, N. J., McLeod, D. M., & Shah, D. V. (2008). Framing Policy Debates Issue Dualism, Journalistic Frames, and Opinions on Controversial Policy Issues. *Communication Research*, 35(5), 695-718.
- Lenz, G. S. (2009). Learning and Opinion Change, Not Priming: Reconsidering the Priming Hypothesis. *American Journal of Political Science*, 53(4), 821-837.
- Liew, V. (2004). Which lag length selection criteria should we employ? *Economics Bulletin*, 3(33), 1-9.
- Linsky, M. (1986). *Impact: How the press affects federal policymaking*. New York: W.W. Norton.
- Lippmann, W. (1922). *Public Opinion*. New York, NY: The Free Press.
- Liu, X., Lindquist, E., & Vedlitz, A. (2011). Explaining media and congressional attention to global climate change, 1969-2005: An empirical test of agenda-setting theory. *Political Research Quarterly*, 64(2), 405-419.
- Luskin, R. C. (1987). Measuring political sophistication. *American Journal of Political Science*, 31(4), 856-899.
- Luskin, R. C. (1990). Explaining political sophistication. *Political Behavior*, 12(4), 331-361.
- MacKuen, M. B., Coombs, S. L., & Miller, W. E. (1981). *More than news: Media power in public affairs*: Sage Publications.
- Malhotra, N., & Krosnick, J. A. (2007). Retrospective and prospective performance assessments during the 2004 election campaign: tests of mediation and news media priming. *Political Behavior*, 29(2), 249-278.
- Marquis, L. (2007). Moderators of priming effects: A theory and preliminary evidence from an experiment on Swiss European policy. *International Political Science Review*, 28(2), 185.
- McCleary, R., Hay, R., Meidinger, E. E., McDowall, D., & Land, K. C. (1980). *Applied time series analysis for the social sciences*: Sage Publications Beverly Hills, CA.
- McCombs, M. (2004). *Setting the agenda: The mass media and public opinion*: Polity Press.
- McCombs, M. E., & Shaw, D. L. (2006). The evolution of agenda-setting research: Twenty-five years in the marketplace of ideas. *Journal of Communication*, 43(2), 58-67.

- McCombs, M. E., Shaw, D. L., & Weaver, D. H. (Eds.). (1997). *Communication and democracy: Exploring the intellectual frontiers in agenda-setting theory*. Mahwah, NJ: Lawrence Erlbaum.
- McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public opinion quarterly*, 36(2), 176-187.
- McGraw, K. M., & Ling, C. (2003). Media priming of presidential and group evaluations. *Political Communication*, 20(1), 23-40.
- Mendelsohn, M. (1996). The media and interpersonal communications: The priming of issues, leaders, and party identification. *The Journal of Politics*, 58(01), 112-125.
- Meraz, S. (2011). Using time series analysis to measure intermedia agenda-setting influence in traditional media and political blog networks. *Journalism & Mass Communication Quarterly*, 88(1), 176-194.
- Miller, F. D., Smith, E. R., & Uleman, J. (1981). Measurement and interpretation of situational and dispositional attributions. *Journal of Experimental Social Psychology*, 17(1), 80-95. doi:10.1016/0022-1031(81)90008-1
- Miller, J. M., & Krosnick, J. A. (1996). News media impact on the ingredients of presidential evaluations: A program of research on the priming hypothesis. In D. Mutz, & P. Sniderman (Eds.), *Political persuasion and attitude change* (pp. 79-100). Ann Arbor: University of Michigan Press
- Miller, J. M., & Krosnick, J. A. (2000). News media impact on the ingredients of presidential evaluations: Politically knowledgeable citizens are guided by a trusted source. *American Journal of Political Science*, 44(2), 301-315.
- Miller, J. M. (2007). Examining the mediators of agenda setting: A new experimental paradigm reveals the role of emotions. *Political Psychology*, 28(6), 689-717.
- Norman, D. A., & Bobrow, D. G. (1975). On data-limited and resource-limited processes. *Cognitive psychology*, 7(1), 44-64.
- Page, B. I. (1978). *Choices and echoes in presidential elections: Rational man and electoral democracy*. Chicago: University of Chicago Press.
- Pan, Z., & Kosicki, G. M. (1997). Priming and media impact on the evaluations of the president's performance. *Communication Research*, 24(1), 3-30.
- Patterson, T. E. (2003). The search for a standard: Markets and media. *Political Communication*, 20(2), 139-143.

- Price, V., & Tewksbury, D. (1997). News values and public opinion: A theoretical account of media priming and framing. In G. A. Barnett & F. J. Boster (Eds.), *Progress in the communication sciences* (pp. 173-212). New York, NY: Ablex.
- Price, V., Tewksbury, D., & Powers, E. (1997). Switching Trains of Thought The Impact of News Frames on Readers' Cognitive Responses. *Communication research*, 24(5), 481-506.
- Rhee, J. W. (1996). How polls drive campaign coverage: The Gallup/CNN/USA today tracking poll and USA today's coverage of the 1992 presidential campaign. *Political Communication*, 13(2), 213-229.
- Rogers, E. M., Dearing, J. W., & Bregman, D. (1993). The anatomy of agenda-setting research. *Journal of Communication*, 43(2), 68-84.
- Rogers, E. M., Dearing, J. W., & Chang, S. (1991). *AIDS in the 1980s: The agenda-setting process for a public issue* (No. 126). Association for Education in Journalism and Mass Communication.
- Romer, D. (Ed.). (2004). *Capturing campaign dynamics. The national Annenberg election survey: Design, method, and data*. Oxford, UK: Oxford University Press.
- Roskos-Ewoldsen, D. R., Roskos-Ewoldsen, B., & Carpentier, F. D. (2009). Media priming. An updated synthesis. In J. Bryant & M. B. Oliver (Eds.), *Media effects. Advances in theory and research* (pp. 74-93). New York, NY: Taylor and Francis.
- Roskos-Ewoldsen, D. R., Klinger, M. R., & Roskos-Ewoldsen, B. R. (2007). Media priming: A meta-analysis. In R. W. Preiss, B. M. Gayle, N. Burrell, M. Allen, & J. Bryant (Eds.), *Mass media effects research* (pp. 53-80). Mahwah, NJ: Lawrence Erlbaum.
- Seo, M. (2007). *Knowledge-based approaches to media priming effects*. The Ohio State University.
- Shah, D. V., Watts, M. D., Domke, D., Fan, D. P., & Fibison, M. (1999). News coverage, economic cues, and the public's presidential preferences, 1984–1996. *The Journal of Politics*, 61(04), 914-943.
- Shaw, D. L., & McCombs, M. E. (1977). *The emergence of American political issues: The agenda-setting function of the press*. St. Paul, MN: West Publishing Company.
- Smith, K. A. (1987). Newspaper coverage and public concern about community issues: A time-series analysis. *Journalism Monographs*, 101.

- Sniderman, P. M., Brody, R. A., & Tetlock, P.E. (1991). Reasoning and choice: explorations in political psychology. New York: Cambridge University Press.
- Snyder, J., & Ballentine, K. (1996). Nationalism and the marketplace of ideas. *International Security*, 21(2), 5-40.
- Soroka, S. N. (2002). *Agenda-setting dynamics in Canada*. Vancouver, British Columbia, Canada: UBC Press.
- Srull, T. K., & Wyer, R. S. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660-1672.
- Stevens, D., & Karp, J. A. (2012). Leadership traits and media influence in Britain. *Political Studies*, 60(4), 787-808.
- Stock, J., & Watson, M. (2003). *Introduction to econometrics*. Boston, MA: Addison Wesley.
- Stroud, N. J., & Kenski, K. (2007). From agenda setting to refusal setting survey nonresponse as a function of media coverage across the 2004 election cycle. *Public Opinion Quarterly*, 71(4), 539-559.
- Takeshita, T. (2006). Current critical problems in agenda-setting research. *International Journal of Public Opinion Research*, 18(3), 275.
- Taylor, S. E., & Koivumaki, J. H. (n.d.). The perception of self and others: Acquaintanceship, affect, and actor-observer differences.
- Taylor, S. E., & Fiske, S. T. (1978). Salience, attention, and attribution: Top of the head phenomena. *Advances in experimental social psychology*, 11, 249-288.
- Togeby, L. (2007). The Context of Priming. *Scandinavian Political Studies*, 30(3), 345-376.
- Traugott, M. W., & Lavrakas, P. J. (2000). *The voter's guide to election polls*. New York: Chatham House.
- Tulving, E., & Watkins, M. J. (1975). Structure of memory traces. *Psychological Review*, 82(4), 261.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.

- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*. doi:10.1016/0010-0285(73)90033-9
- Uscinski, J. E. (2009). When does the public's issue agenda affect the media's issue agenda (and vice-versa)? Developing a framework for media-public influence. *Social Science Quarterly*, 90(4), 796–815. doi:10.1111/j.1540-6237.2009.00663.x
- Valentino, N. (1999). Crime news and the priming of racial attitudes during evaluations of the president. *Public Opinion Quarterly*, 63, 293-320.
- Walgrave, S., Soroka, S., & Nuytemans, M. (2008). The mass media's political agenda-setting power: A longitudinal analysis of media, parliament, and government in Belgium (1993 to 2000). *Comparative Political Studies*, 41(6), 814-836.
- Wanta, W. (1997). *The public and the national agenda: How people learn about important issues*: Lawrence Erlbaum.
- Willnat, L., & Zhu, J. H. (1996). Newspaper coverage and public opinion in Hong Kong: A time series analysis of media priming. *Political Communication*, 13(2), 231-246.
- Wyer Jr., R. S., & Srull, T. K. (1989). *Memory and cognition in its social context*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Zaller, J. R. (1992). *The nature and origin of mass opinions*. New York: Cambridge University Press.
- Zhu, J. H. (1992). Issue Competition and Attention Distraction: A Zero-Sum Theory of Agenda-Setting. *Journalism Quarterly*, 69(4), 825-836.
- Zhu, J. H., & Boroson, W. (1997). Susceptibility to agenda setting: A cross-sectional and longitudinal analysis of individual differences. *Communication and Democracy: Exploring the Intellectual Frontiers in Agenda-Setting Theory*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.
- Zucker, H. G. (1978). The variable nature of news media influence. *Communication yearbook*, 2, 225-240.