Reliability and validity of scene units in the visual content analysis

By

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Abstract

Unlike newspaper articles that have a clear physical unit such as a paragraph or a sentence, television news stories are difficult to breakdown into smaller unit. This study proposed a scene, a subunit within a broadcast news stories, as a coding unit for content analysis of visual news stories. The guideline for segmenting a whole story into scene units is discussed in detail within a context of political campaign coverage.

In order to test the reliability of scene unit segmentation, the study tested the inter-coder reliability of scene segmentation for two trained coders and found an acceptable inter-coder reliability coefficients. Additionally, the study tested the validity of scene unit coding by comparing content analysis results conducted with a scene unit with a whole story unit. The results showed that broadcast news stories content analyzed with a scene unit coding produced different results from the story unit coding.

Unitization of media messages is a very important methodological issue in content analysis research. Unitization is most developed in text message analysis such as newspaper and magazine research since clear physical structures such as a sentence or paragraph exist within a message. Many newspaper stories are often analyzed with smaller units such as a paragraph, assertion, sentence or word.

The most underdeveloped area of research for unitization is visual messages. Unitization for feature films or dramas is more easily achieved since sequence or scene changes are clearly indicated in scripts. Short visuals, such as television commercials (Zhou, Zhou, & Xue, 2005) and political advertising are sometimes content analyzed with shot units. However, an hour long documentaries or broadcast news stories are difficult to breakdown into sub-units because clear physical sub-structures that comprise a whole story are difficult to distinguish. Therefore, many television news stories adopt a whole story as the unit of analysis.

One disadvantage of content analyzing a whole story as the unit of analysis is that since many news stories contain more than one idea or perspectives within a story, coding a whole story into one value may misrepresent or ignore other perspectives also presented within a story. Krippendorff (1980) asserts that "sampling units are often too large, too rich, or too complex to serve as a unit for description. For example, a film that makes creative use of documentary material is difficult to categorize as presenting either fact or fiction. It contains both. However, by describing smaller units, scenes, editing shots or individual frames, for example, one is likely to yield unambiguously codable recording units" (page. 59). Similarly, Lichter (2001) argues that content analyzing a television news into sub-unit, an individual statement in this case, permits "far more precise differentiation of campaign discourse than story-level coding affords" (p. 10).

This research proposes a scene as the unit of analysis for visuals, and tests the reliability and validity of adopting a scene as the unit of analysis in media content research. In this research, the concept explication of a scene will be discussed within the context of political campaign coverage first. A detailed guideline as to how to segment a whole story into scene units will be discussed. Second, in order to test the reliability of scene segmentation, inter-coder reliability of scene segmentation will be tested to see if an acceptable accordance can be achieved between two trained coders. Third, this paper

will test the validity of scene unit coding by comparing content analysis results produced by a scene unit coding with a whole story unit coding. Whether two studies with different coding units will produce difference results will be discussed.

Krippendorff (1980) states that "regarding unitization, the general recommendation is to aim for the empirically most meaningful and productive units that are efficiently most meaningful and productive units that are efficiently and reliably identifiable and that satisfy the requirements of available techniques" (p. 64). This paper proposes a scene as the most meaningful units of analysis for visuals and tries to test the reliability and validity of using a scene as the unit of analysis in broadcast news research.

Theory

Units in visual content analysis

Studies that quantitatively content analyzed visuals including television news, documentaries, movies and drama have adopted various forms of unit of analysis in their research. Most common form of content unit in visual studies, especially in television news studies has been a whole story or a news item. Studies that examined the effects of audio-video redundancy on understanding of news stories (e.g. Drew & Grimes, 1987), studies that compared the effectiveness of talking heads versus film on news learning and comprehensions (Drew, Reeves, 1984; Edwardson et al., 1981; Gunter, 1987; and Jorgenson, 1955) and news structure studies (Nimmo & Combs, 1985; Robinson & Levy, 1986; Woodall, 1986) have used a story as the unit of analysis.

Some studies have used a shot as the unit of analysis. Grabe (1996) analyzed South African Broadcasting Company's coverage of election with a shot unit. She examined shot length, camera angle, and camera movement to compare how the news stations in South Africa had portrayed political candidates differently. Many advertising studies have also used a shot as the unit of analysis in their content analysis of television commercial visuals (e.g., Zhou, Zhou, & Xue, 2005).

Other than a story or a shot that have clear physical structure, other units are often used in visual analyses. In many of television violence studies, each act of hitting or kicking constitutes a separate unit of analysis (See Potter, 1999). In film studies, the

number of times a character appears, speeches made by a character, or the duration of a person's appearances is often used as the study unit.

Riffe, Lacy and Fico (1998) classified content units into physical units and meaning units. Physical units indicate units that can be physically explained such as books, financial reports, issues of a newspaper, letters, and poems. Physical units are independent of symbolic meanings. The story unit that is often used in broadcast news is considered as a physical unit. The meaning unit also involves physical qualities, but also considers symbolic meanings implied in the content. The meaning units (symbolic units) are further categorized as syntactical, referential, propositional and thematic units (Krippendorff, 1980). The syntactical units are defined as smaller physical units within the bigger physical units that have symbolic meanings (Riffe, Lacy & Fico, 1998). This scene unit proposed in this study can be categorized as this syntactical unit.

Unitizing broadcast news stories

Attempts to segment a whole story into smaller subunits had been made by a number of scholars. Altheide (1985) segmented a news story into a subunit called an 'information unit' that are consist of separate subject or objective dimension, angles or statements. He thoughts "*information units* are analogous to the sentences of a paragraph or a paragraph in a complete story. For example, an item could be a story on the federal budget, with separate information units referring to the President's policy, opposition party reaction, an angle on inflation as resented by the reporter, and a concluding statement by the anchorperson" (Altheide, 1985, pp.99-100). His study showed that a broadcast news story is composed of several discordant information units that share different perspectives or angles.

Another study proposed "visual scenes" as a unitization of news visuals (Graber, 1990). Graber describes a visual scene as "a shot or shots of the same subject, bounded by adjacent scenes of different subjects. A new scene means cutting to a completely new subject, not merely within a scene, or a pan shot, or a change in focus through zooming or changing angles. The recorded focus of each scene could be people, animals, animated objects, locations or views of graphic or text" (pp. 135-136).

Fields (1988) suggests unitizing content as the first step in analyzing television news. He defines a unit as "a portion of content conveying a structurally unified meaning within a large message" (Fields, 1988, p. 184). He thinks this unit can be a sentence, paragraph, or an exchange in dialogue for the print media, but in broadcast news, the units may consists of a entire broadcast, a story within a broadcast, combinations of speech and dialogue, and visual images within a segment.

Discourse analysts who study the grammar of television news have also attempted to segment a news story into smaller units (Bentele, 1985; van Dijk, 1988). Bentele (1985) called this micro unit a "super-sequence," a single thematic presentation within a story. Visual presentation format, shot boundaries, and content criteria are suggested as three main criteria that divide a story into super-sequences. The content criteria, which involve thematic and geographical relevance, should only be used when content itself obviously marks off a super-sequence.

Although previous studies uses different terms to describe a subunit within a whole visual story, such as information units or visual scenes, these terms indicate units within a story that visually and verbally represent a single theme or an idea. In this study, this subunit is explicated as a scene.

Concept explication of a scene

In order to fully understand what a scene is, the structure of visual should be examined first. The most basic unit of a television visual analysis is a frame. A frame is representative still of a shot (Iedema, 2001), and 30 fames comprise a second length of broadcast visuals and 24 frames comprise a second length of a film. The next level is the shot. A shot is an uncut camera action comprised of hundreds of frames. The next level is the scene, which is usually composed of more than one shot. In film studies, a scene is simply defined as "a series of shots (or a shingle shot) that take place in a single location and that deal with a single action" (Monaco, 1977, p. 427). A more elaborative definition describes a scene as "the smallest level of film form that possesses that Aristotelian wholeness needed before one can dare to make meaningful statements and criticisms" (Whitaker, 1974, p. 48). The scene is the basic unit that constructs a meaning in a news story.

The term scene is sometimes used interchangeably with the term sequence and montage. A sequence is a series of shots depicting the details of an event in their approximate chronological order of occurrence (Green, 1969). Montage is "the arrangement in time of the film's linguistic elements so that they interact to create a total message that is greater than, or different from, the sum of messages considered separate" (Whitaker, 1970, p. 128). Montage states a theme, demonstrates a condition, and establishes a mood. Scene should be understood as a concept that embodies both the concepts of sequence and montage. Scene is both a series of shots depicting a single action taking place in a single space, and a montage which depicts a single concept, a theme or an idea without the limitation of time and space (Choi & Lee, 2006).

A scene has been explicated and defined as a subunit within a broadcast news story by Choi and Lee (2006). They proposed seven criteria that mark scene segmentation in broadcast news stories. Changes in presentation format and content are the two main criteria for segmenting a story into scenes, and a format change always marks a scene change, regardless of content changes. The five presentation change rules includes (1) visual format changes within a story such from the studio anchor scene to the reporter standing, or changes from interview scenes to actualities or computer graphics marks a scene change (2) Establishing shots or inserts for interviews are included in the interview scene, (3) A new scene is usually indicated by a transition shot, (4) A scene includes at least one complete sentence of a reporter's voice-over or sound bite, and (5) A scene has visual continuity. Two additional rules for content changes include, (1) When one or more of six script structures – who, what, when, where, why, and how – of the thematic structure of a story change, this indicates a beginning of a new scene, and (2) A scene should establish a sense of cohesion.

Choi and Lee (2006) also examined how the position, length, and proportion of a scene frame and valence are related to overall story frame and valence. They expected that frames and valence featured in early scenes, longer scenes, and scene with high dominance within a story are more likely to be the overall story frame and valence. They study found that frames and valence expressed in early scenes of a news story do not necessarily become the overall frame and valence of the story. Also, frames presented in longer scenes do not determine the overall story frame and valence.

However, the proportion of scene frame and valence that accounts for the greatest proportion of a news story is likely to become the story frame and valence. In this research, the scene segmentation was conducted by the researcher, thus, the reliability of scene segmentation practice with two separate coders had not been examined.

Defining a scene in political campaign coverage

This research chose election news coverage as the first context to test the reliability and validity of scene unitization, since election news stories have clear social issues and political actors with two clearly distinguished opponents. A modified definition of a scene for the television election coverage was made based on the previous definition made by Choi and Lee (2006), and suggested below. The definition includes five rules for visual changes and two rules for content changes.

Visual changes

1. *A new scene is usually indicated by a transition or establishing shot that introduce viewers to a new setting or an idea.*
2. *A scene includes at least one complete sentence of a reporter's voice-over or sound bite.*
3. *A scene has visual continuity*. A scene is composed of one theme, which is often expressed in continuity of visuals.
4. *Reporter standing (wraps) and interviews (Q & A) are considered as separate scenes.*
5. *Inserts for interviews or graphics are included in the interview or graphic scenes.* When similar thematic visuals are used to introduce, elaborate, clarify, or explain the context of an interview or graphs, those shots are included in the interview or graphic scenes.

Content changes

1. *When one or more of six script structures – who, what, when, where, why and how – change, this indicates a beginning of a new scene.* Changes in who (the main character), what (the issue or event), and why and how

(perspective) are considered more important than changes in when (time) and where (place).

Changes in the character (who)

- Main character
- Political candidates
- Democratic/ Republican supporters or campaign staffs
- Voters with different demographics

Changes in actions or events (what)

- When the focus of the story shifts from one political party to the other
- Different attributes of a candidate is introduced
- When new political issues are discussed
- When new election events are introduced

Changes in rationale (why & how)

- When there is a shift in valence
- When a new perspective on a candidate's policy is introduced
- When a new perspective on a character's attribute is introduced
- When a new perspective on a political event is provided
- When a new perspective on a poll result is provided

Changes in time (when)

- Introduction of candidates' past deeds or policies
- Introduction of future policies or actions
- Introduction of upcoming events

Changes in places (where)

- Shifts in campaign sites (moving from one state to another)

- When new places are introduced in stories, such as affluent neighborhood to less privileged neighborhood

1. Verbal languages with a scene should establish a sense of cohesion (van Dijk, 1988) .

Hypotheses

This study will advance Choi and Lee (2006)'s study in two ways. First, this study employs two trained coders to see whether scene segmentation could be conducted with an acceptable reliability level between two coders. If this succeeds, this will illustrate the reliability of the scene unitization methods. Second, this study will compare content analysis results conducted with a scene unit with a whole story unit. This will test the validity of scene unitization in television news content analysis. This study assumes that scene unit analysis will provide a more accurate representation of actual media content than a whole story unit.

R1: Can reliability testing of scene unitizing achieve an acceptable agreement level between two coders?

R2: How much will content analyzing broadcast news in a scene unit produce different research results from content analyzing broadcast news with a story unit?

Methods

The presidential election coverage of 2008 was content analyzed for the study. First, reliability testing of two coders in scene segmentation was conducted. Second, results of content analyses conducted by the scene unit and by the whole story unit were compared.

Sampling of stories

Every news stories related to the presidential election coverage aired in ABC, CBS and NBC's evening news programs from August 27, 2008, the convention day for

the Democratic Party through November 4, 2008, the election day were sampled from the Vanderbilt Television News Archive. Among the sampled news stories, stories not directly related to the two presidential nominees, vice present candidates, voters and campaigning, such as a report on popularity of early voting and a story that introduces Saint Paul where the Republican convention took place were excluded from the sample.

Stories other than complete packaging stories, such as short stories read by anchors, interview stories with candidates, correspondents between an anchor and a reporter, and interviews with political analysts in the studio, were also excluded from the sample. As a result, a total number of 191 stories were sampled for the study.

Scene unitization

Two graduate students majoring communication studies participated in producing a coding booklet and were trained for two weeks. After segmenting five stories into scene units separately, they watched the five stories together to adjust their interpretation of coding schemes and narrow discrepancies in their coding. In order to clarify questions that comes up during the initial process of coding, the two coders coded in the same office for the first two days. News stories were recorded in 17 CDs, and the first coder coded even number CDs while the second coder coded the odd number CDs.

The news stories were segmented based on the definition of a scene listed in the theory section. Studio anchor scenes were not coded, and when a story is reported with two different reporters and separated by a brief computer graphic signal it was considered as two separate stories.

Story coding

Story coding was conducted a month after the scene coding. One coder who participated in the scene unitization coding participated in the story coding with another newly trained coder.

Coding categories

Five coding categories, the main character, valence, image& issue, and episodic

& thematic were coded in this study to compare the results between scene unit and story unit coding.

Main character

Stories and scenes were coded as McCain, Obama, both of the candidates, and the others. McCain's stories and scenes included stories about John McCain, his running mate, Sarah Palen, their families and supporters. Stories and scenes about Barack Obama, his running mate, Joe Biden, and their families and supports were coded as Obama's news. When both candidates were featured in one story or a scene, a candidate who were more significantly or importantly featured in a story became the main character. When the two candidates were equally treated in the story, the story or the scene was coded as having both of the candidates as the main characters. When stories about people other than the either sides of the candidates were featured in a story or a scene, it was coded as the others. For the analysis, stories and scenes that fall into the both and the other category were excluded.

Image & Issue

A story or a scene was coded as issue if a candidate's stance on policy is directly discussed, and coded as image if a candidate's personal qualifications, such as competency, honesty, hard-working, morals and his family life are discussed. Stories and scenes that do not discuss about candidates' image and issue were excluded in the analysis.

Episodic & thematic

A story or a scene was coded as episodic if a new cases, characters, and places are introduced with episodes. Typical episodic stories include candidates visiting a restaurant and making conversation with people dining in the restaurants, stories of young supports who are traveling together to listen to candidates' speeches, conversation of women voters in a farmer's market, and candidates' past family stories. In short, stories that have concrete characters and events were coded as episodic. Thematic stories included stories or scenes that provide background information and thematic analysis. For example, stories that calculate tax changes for three households that represent different economic status according to two candidates' tax policies, and stories that analyze situations or issues were coded as thematic stories or scenes. If a

story or a scene does not fall into either of the category, it was coded as the others, and excluded from the analysis.

Valence

Valence was coded as positive, negative and neutral from the perspective of the main character. If a story or a scene was positive towards the main character and negative towards the opponent, it was coded as positive. The same rule was applied for the negative stories and scenes. When a story or a scene was neutral toward the main character, it was coded as neutral.

Scene duration coding

Each of scene's duration was measured in seconds.

Intercoder reliability

Intercoder reliability was calculated for story and scene units separately. For story unit, 20 stories were randomly sampled from the sample and then coded by two coders. Cohen's Kappa for the main character was 1.00, valence was .69, image & issue was .83, and episodic & thematic was .32. For the scene unit, another 10 news stories comprised of 42 scenes were randomly selected from the sample and coded by two coders. The inter-coder reliability for the character was .95 , valence was .60, image & issue was .35, and episodic & thematic was .27.

According to Landis & Koch (1977)'s guidelines for interpreting Cohen's Kappa's coefficients, coefficients between .21 to .40 indicate fair agreement, .41 to .60 means moderate agreement, .61 to .80 indicate substantial agreement, and .81 to 1.00 indicates almost perfect agreement. Since most of the Cohen's Kappa's values are above .6 with three values in between .21 to .40, which are considered fair agreement, reliability results reached an acceptable level.

Results

A total of 191 stories yielded 1104 scenes. The number of scenes within a story ranged from one to 18, and the average number of scenes per a story was 3.77 scenes (SD = 2.38). Scene duration ranged from 3 seconds to 118 seconds (one minute 58

seconds).

Scene unitization

In order to test the reliability of scene unitization, 50 stories were randomly selected and coded by two coders. Ideally, perfect reliability means that each story is broken into exactly same number of scenes between the two coders and at the same time the scene change points are identical for both coders. Even though two coders agree on the number of scenes within a story, if the scene change points do not coincide, this does not indicate acceptable agreement. Therefore, two kinds of reliability testing – the number of scenes in each story and the scene change points – were conducted. First, for the number of scenes in each story, a correlation of scene numbers in each of 50 stories segmented by two coders was calculated and yielded a statistically significant correlation coefficient ($r = .66$, $p < .01$). This indicates that two coders showed a certain level of agreement in terms the number of scenes that comprise each of stories.

Second, for the scene change points, the percentage of times the scene change points coincides was calculated for each of the story. For example, if a story is broken down into 6 scenes (5 scene change points) and scene change concurred 4 times between two coders, this story was given .80(4/5) of agreement score. When the total number of scene numbers differed between the two coders, the larger number of scenes was used. The mean of this agreement scores across all stories was .79 (SD= .16). This indicates that 79% of times, two coders segmented a story into scenes with same scene change points.

Comparison between scene unit and story unit coding

Mixed ANOVA analyses were conducted for the main character, image & issue, episodic & thematic, and valence to see whether content analyzing broadcast news with a scene unit produce different research results from content analyzing broadcast news with a story unit. For the analysis, scene frequency and scene duration for each of coding categories were used as dependent measures. After each of the scenes was coded with a scene unit, scene's frequency and duration information was collapsed into a story unit. For example, for the frequency of main character scenes, the number of Obama's

scenes and McCain's scenes were calculated for each of the whole story. For the duration, the Obama's scene duration and McCain's scene duration within a story were calculated for each of the whole story. Since the story unit was used for the analysis, each of the story unit coding became the between factor and the collapsed scene unit information became the within factor the ANOVA analyses.

Since the main effects merely indicate whether there were frequency or duration differences between the two main characters, the main effects were not of interest for this research. The important result was the interaction. If the interaction was significant, it means that stories that had more Obama scenes than McCain scenes were coded as Obama stories, and stories that had more McCain scenes than Obama scenes were coded as McCain stories. If the interaction was not significant, it indicates that the coding of scene units and story units produced different results.

Since there were four coding categories, four sets of ANOVA analyses were conducted for scene frequency and scene duration respectively: the frequency and duration of character (Obama vs. McCain) scenes, the frequency and duration of image/issue scenes, the frequency and duration of episodic/thematic scenes, the frequency and duration of valence (positive/neutral/negative) scenes. Figure 1 illustrates how these analyses were conducted.

Results about scene frequency will be discussed first. Figure 2 shows a significant interaction between story-unit character and scene-unit character in terms of the frequency (number) of scenes about each character in a story. As a follow up analysis, two t-tests compared the frequency of Obama scenes and McCain scenes for Obama stories and for McCain stories respectively. Both significant results indicate that Obama stories had more Obama scenes than McCain scenes, whereas McCain stories had more McCain scenes than Obama scenes.

The ANOVA analysis for image and issue was also significant as Figure 3 shows. Follow up t-tests for image stories and issue stories were also significant, which indicates that stories that had more image scenes were coded as image stories, and stories that had more issue stories were coded as issue stories.

The interaction for episodic and thematic stories was also significant as Figure 4 shows. The follow up t-test analyses were also significant, so that for thematic stories,

there were significantly higher number of thematic scenes than episodic scenes. However, episodic stories were found to have more thematic stories than episodic stories, which indicates that coders have coded a whole story as episodic when there were higher numbers of thematic stories.

The interaction analysis for valence was also significant (Figure 5). Since there were three attributes for valence, one way ANOVA analyses and Bonferroni post-hoc were conducted for positive, neutral and negative stories. The results showed that positive stories had significantly higher number of positive scenes than neutral or negative scenes. Unexpected results showed up for neutral and negative stories. For neutral stories, the mean number of neutral scenes was higher than negative scenes but not higher than positive scenes. There were no statistical differences between positive and neutral scenes for neutral stories, which indicates that when there were similar number of scenes for positive and neutral scenes, the story was coded as neutral. For negative stories, the number of three scenes, positive, neutral and negative scenes did not show any mean difference. This indicates that when similar numbers of positive, neutral and negative scenes exist, coders tended to code the whole story as negative.

Similar patterns were found for scene duration analyses. All four interaction analyses were significant as Figure 6 through 9 shows. For the main character, the follow up analyses showed that the duration for Obama scenes were longer than McCain scenes for Obama stories, and the duration for McCain scenes were longer than Obama scenes for McCain stories. For image and issue stories, stories with longer duration of image scenes were coded as image stories, and stories with longer duration of issue scenes were coded as issue stories.

For the thematic stories, the duration for thematic scenes was longer than episodic scenes. However episodic stories contained longer thematic scenes than episodic scenes, which showed a similar result with the scene frequency analysis. For the valence, positive story contained significantly longer duration of positive scenes than neutral and negative scenes. However, for neutral stories, the duration for the positive and neutral scenes were longer than the negative scenes, but the duration for positive and neutral scenes did not show any difference. This indicates that when the duration of positive and neutral scenes were similar, the story was more likely to be

coded as neutral. For negative stories, the duration for positive and negative scenes was higher than neutral scenes, but the duration of positive scenes did not differ from the negative scenes. This shows that when the duration for positive and negative scenes was similar, coders identified the whole story as negative stories rather than positive stories.

Discussion

This study's aim was to verify the reliability of scene segmentation conducted by two newly trained coders. The correlation of scene numbers for each stories produced by two coders were high (r =.66), and showed 79% synchronization level for scene segmentation points. This indicates that two coders segmented a story into similar scene numbers, and 79% of time, scene change occurred at the same point. A close analysis of the segmentation shows that one coder consistently came up with more scene numbers than the other coder, and this resulted in not so high correlation, but the scene segmentation points were similar. This shows that scene segmentation conducted between two coders were successful, and produced a reliable result. This further implies that a scene is a unit that multiple coders can identify reliably.

This study also tried to show the values of content analyzing broadcast news stories into scenes units rather than a whole story unit. The results of this study show that coding a broadcast news story into a scene unit and a story unit indeed produced different results for some coding categories. Attributes of scenes with high frequency and duration became the attributes of the whole story for main character and image and issue stories. However, when a story was coded as episodic or thematic, even though when there were more thematic scenes, the whole story was more likely to be considered as episodic. Only when the frequency and duration of thematic scenes outnumbered episodic scenes considerably, the story was considered thematic. In shorts, coders tended to code a whole story as episodic when there were some episodic scenes.

This finding implies that episodic stories or scenes have stronger influences on coders' judgment than thematic stories or scenes. This finding is somewhat similar with research related to episodic and thematic memory. Psychologists have found that episodic and less abstract evaluation of an object elicit attitudinal changes more than recollection of abstract evaluation of an object (see Eiser, 1994). The vivid recollection

of having tasted a sour gooseberry for the first time elicits more attitudinal change than mere recollection of disliking the gooseberry. Although this study is not about attitudinal changes, this finding implies that when episodic and thematic scenes are shown together, people are more influenced by vivid episodic stories and tend to consider the whole story as episodic rather than thematic. Similarly, Reese stated that episodic stories that offer compelling stories with concrete events and characters are cognitively more readily received by viewers than more accurate but duller thematic stories (Reese, 2001).

Another reason is that when episodes are featured at the beginning of a story, the whole story seems more like an episodic story rather than thematic story. For example, if a story about candidates' stances on medical reform begins with a story of a family who are suffering from the lack of insurance coverage at the beginning of a story, even if the story later develops into a thematic story, people may still consider the whole story as episodic because the story began with an episode.

Valence coding also produced different results between the scene coding and the story coding. For frequency coding, when there were absolutely higher number of positive scene numbers than neutral or negative, the story was coded as positive. However when the positive and neutral scene numbers were similar, the story was coded as neutral. When there was no difference between the positive, neutral and negative scene numbers, the whole story was coded as negative. Similarly, when there was similar duration of positive and neutral scenes, the whole story was coded as neutral. When the duration of positive scenes and negative scenes were similar within a story the whole story was coded as negative. In short, negativity effect was found for valence coding.

Many studies have found that when both positive and negative messages are presented together, negative and unfavorable traits receive more attention than positive and favorable information (e.g., Briscoe, Woodyard, & Shaw, 1967; Levin & Schmidt, 1969; Miller & Rowe, 1967; Wyer, 1970). This phenomenon is explained by the "negativity effect" theory, which posits that negative information is more salient, and therefore is much more likely to be attended and processed (Anderson, 1974; Fiske, 1980; Hamilton & Huffman, 1971; Wyer, 1970; Levin & Schmidt, 1969), and better

remembered (Pratto & John, 1991). Individuals weigh negative information more than positive information when making evaluations of social stimuli (Anderson, 1965, Hodges 1974, Kellermann 1989), and when forming impressions of a person (Fiske 1980, Hodges 1974, Levin and Schmidt 1969). One or two exposures to negative information are as memorable as five to ten exposures to positive information (Guskind and Hagstrom, 1988).

Studies that examine television messages have found better memory for negative than positive television commercials about products and services (Lang & Friestad, 1987; Thorson & Friestad, 1985). When people's attention to television messages was measured using an EEG, the electroencephalogram that measures attention, positive and negative scenes produced different hemispheric responses. Positive scenes led to greater arousal in the left hemisphere of the brain, and negative scenes evoked greater arousal in the right hemisphere (Reeves, Lang, Thorson & Rothschild, 1989). The study found greater attention for negative scenes. This negativity effect was observed widely in many psychology, social and political science research. Since coders are also influenced by the media content, this study illustrates that this negativity effect is observed in coders' evaluation of scene valence.

In summary, this study proposed a scene as the subunit within a broadcast news stories that can be used in content analysis and tested the reliability and validity of scene unit coding. The reliability of scene coding was tested and achieved by two coders. This reliability testing should be re-tested with more coders and with more diverse topics of news stories in the future stories. The validity of scene unit coding was explored by comparing the story unit coding results with the scene unit coding results. Since some discrepancies between the two results were observed, the validity of scene unit coding was supported. Scene unit coding yields more accurate account of the visual media than the whole story coding. Additionally, this study showed that many stories are composed of diverse attributes, and coding the whole story as one attributes distorts or at least ignores other attributes also presented within a story. Content analyzing a whole story into scenes would allow researchers to have a better understanding of how a whole story is structured, such as allocation of attributes within a story and the order in which those attributes are allocated within a story.

This study came up with a coding guideline for political campaign news coverage, but could not provide a very concrete and universal coding scheme. This indicates that a scene is a very complex concept to be defined by several paragraphs. A more pragmatic guideline as to how to segment a scene into smaller units should be refined in future research.

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Table & Figures

Figure 1. Mixed-factor ANOVA models.

		Scene-unit	
		Obama	McCain
Story-unit	Obama		
	McCain		

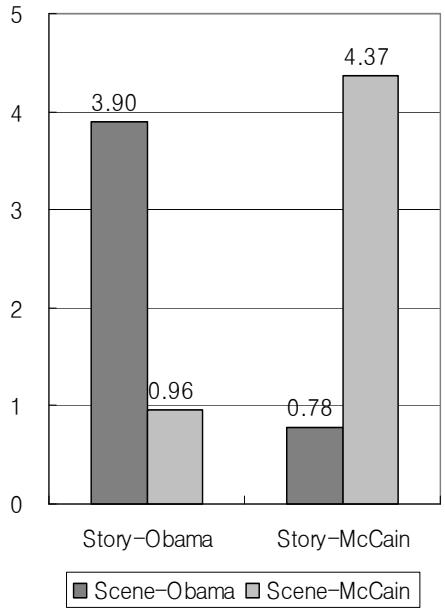
		Scene-unit	
		Image	Issue
Story-unit	Image		
	Issue		

		Scene-unit	
		Episodic	thematic
Story-unit	Episodic		
	Thematic		

		Scene-unit		
		Positive	Neutral	negative
Story-unit	Positive			
	Neutral			
	Negative			

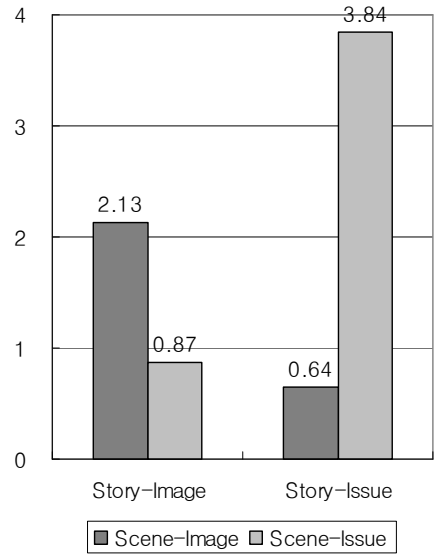
Story-unit variables are between-factors while scene-unit variables are within-factors. Dependent variables are scene umber and scene duration.

Figure 2. Mean scene numbers for Obama & McCain stories



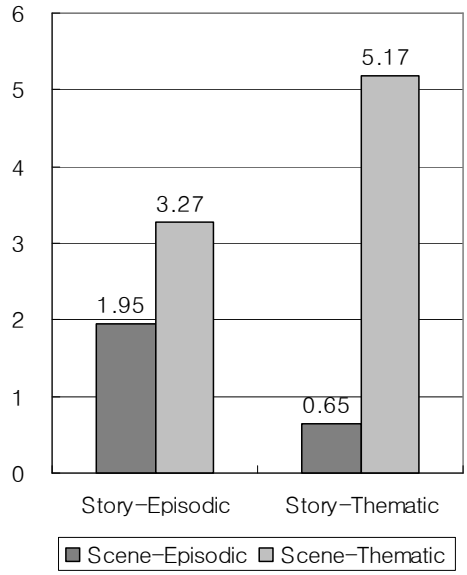
Interaction: F = 309.53 (1, 178), P <.01
Scene number difference for Obama stories: t = 10.53, df = 76, p<.01
Scene number difference for McCain stories: t = -14.93, df = 102, P <.01

Figure 3. Mean scene numbers for image and issue stories



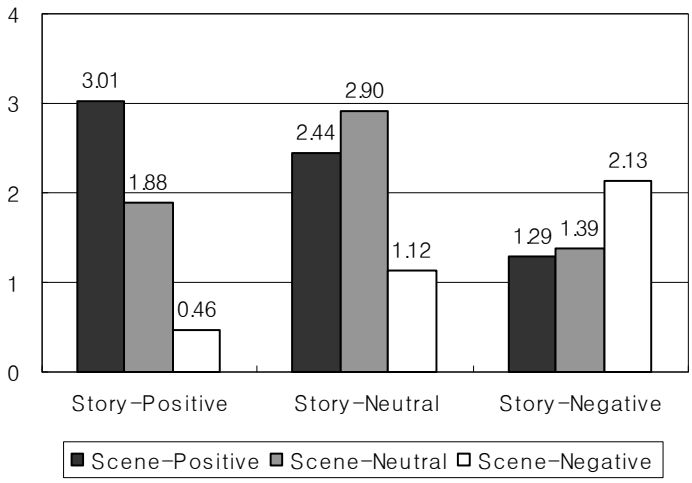
Interaction: F = 115.26 (1,173), P <.01
Scene number differences for image stories: t = 5.69, df = 104, P <.01
Scene number differences for issue stories: t = -8.30, df = 69, P <.01

Figure 4. Mean scene numbers for episodic and thematic stories



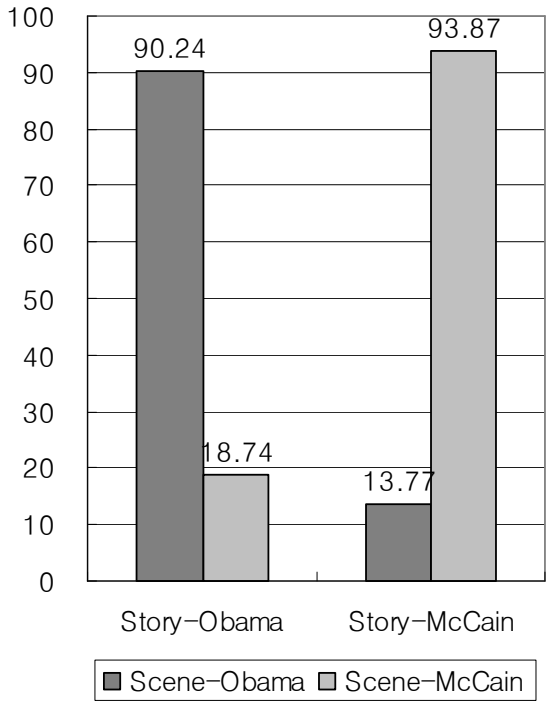
Interaction: F = 49.03 (1, 187), P <.01
Scene number difference for episodic stories: t = -4.17, df = 85, p<.01
Scene number difference for thematic stories: t = -13.87, df = 102, P <.01

Figure 5. Mean scene numbers for positive, neutral and negative stories



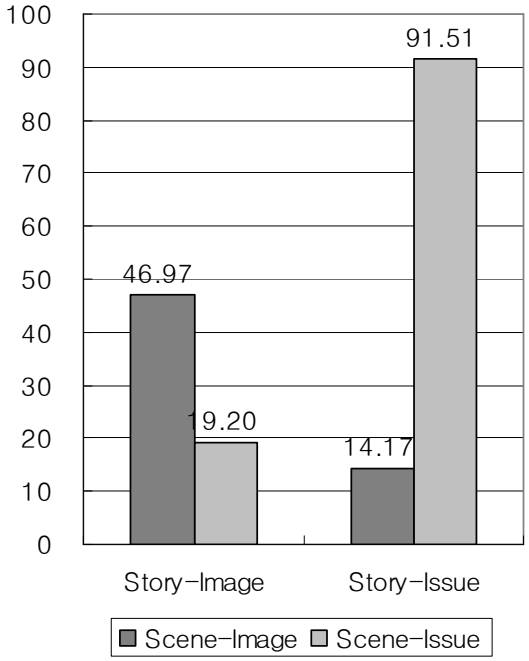
Interaction: F = 13.75 (4, 370), P <.01
Scene number difference for positive stories: F = 73.81 (2,150), P <.01
Scene number difference for neutral stories: F = 15.36 (2,160), P <.01
Scene number difference for negative stories: F = 2.37 (2, 60), P =.10

Figure 6. Mean scene duration for Obama and McCain Stories



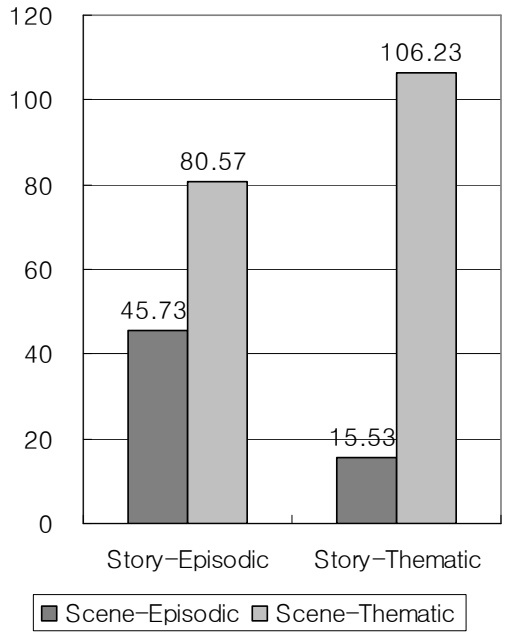
Interaction: F = 378.88 (1, 179), P <.01
Scene duration difference for Obama stories: t = 11.60, df = 77, p<.01
Scene duration difference for McCain stories: t = -16.29, df = 102, P <.01

Figure 7. Mean scene duration for image and issue stories



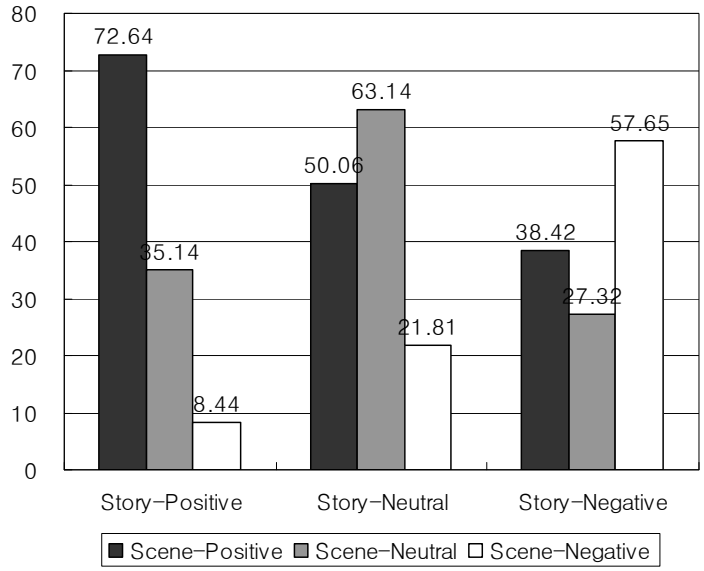
Interaction: F = 117.47 (1, 176), P <.01
Scene duration difference for image stories: t = 5.55, df = 106, p<.01
Scene duration difference for issue stories: t = -8.39, df = 70, P <.01

Figure 8. Mean scene duration for episodic and thematic stories



Interaction: F = 39.06 (1, 190), P <.01
Scene duration difference for episodic stories: t = -5.02, df = 87, p<.01
Scene duration difference for thematic stories: t = -15.76, df = 103, P <.01

Figure 9. Mean scene duration for positive, neutral and negative stories



Interaction: F = 16.77, (4, 378), P <.01
Scene duration difference for positive stories: F = 82.55 (2,154), P <.01
Scene duration difference for neutral stories: F = 13.73 (2,164), P <.01
Scene duration difference for negative stories: F = 3.57 (2, 60), P <.05