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Enhancing VNR Impact: The Effects of Captioning on Memory and Understanding of TV News

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Video news release (VNR) producers limit references in VNRs to the sponsor of the VNR to avoid rejection by news directors on the grounds that the story is merely a commercial message for the sponsor. We posited in this study that when reference is made to the sponsor, optimal effect may be garnered by judicious use of captions in the VNR. An information-processing experiment was conducted to evaluate the effect of limited captions on memory and understanding of TV news. Success with VNRs has been notable in two genres: scientific/medical/technical topics and event coverage. News items in this study tapped these two genres, categorized as abstract/word stories and concrete/picture stories, respectively. Captions improved memory for abstract/word stories but not for concrete/picture stories. Captioning had no significant effect on either understanding or visual recognition of the stories. We conclude that VNR producers might best use captions to the sponsor's advantage in scientific/medical/technical stories but should expect only enhanced recall of information, not understanding or visual recognition.

A number of surveys indicate that video news releases (VNRs) produced by over 24 VNR suppliers ("VNR Update," 1989) are used by a majority of stations nationwide (Courson, 1988; Manoff, 1989; "National Study," 1988; "TV News Directors Surveyed," 1986). Use appears to be occasional, with

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surveys indicating infrequent use. The main objection to VNRs screened by news directors is "puffery" in the form of either frequent mention of the VNR sponsor or obvious bias in favor of the sponsor (Dauer, 1990; "National Study," 1988; Spayde, 1990). Having too frequently seen puffery along with amateur production values, news directors are selective in their use of VNR material (Walker, 1987). For this reason, professional VNR producers recommend that only limited reference be made to the sponsor or the sponsor's product (Miller, 1990).

A number of VNR specialists recommend that VNRs go out in three forms: completed package with two-track sound and what are called supers or captions; same package without captions; and b-roll tape comprised of raw footage of action shots, scenery, and graphics about the topic (*Medialink Handbook,* 1990; Swonger, 1990).

B-roll is frequently used as material to develop or supplement a story done by station staff, with news staff having control of message content (Rubin, 1989). Alternatively, stations will use the edited package, running the video and the audio track with natural sound but using a station voice-over in place of the second audio track (Courson, 1988; Swonger, 1990). In these instances, stations may not use the captioned version, once again, because it restricts editing. This is why some experts recommend against computer-generated characters to identify interview subjects (Klepper, 1987).

Why offer a version of the story with captions if it appears to be least editable and thereby least likely to be picked up by a station? Captions offer several advantages. Captions have traditionally been used to clarify and reinforce a key point or to facilitate presentation of difficult material (Gunter, 1987). Captions may also provide an opportunity to identify a product or a corporate spokesperson or to clarify and reinforce a key point important to the sponsor of the VNR. Such information gain serves a common public relations objective: increase in knowledge among members of target publics (Broom & Dozier, 1990, p. 36; Grunig & Hunt, 1984, chap. 6).

Use of captions has increased in TV newsrooms (Foote & Saunders, 1990). Failure to use captions in such a graphics-rich environment may actually hamper chances that news editors will use the VNR. It may be that the truism in public relations—that VNRs should be a "clean feed," free of captions—is dated.

The question then becomes: Are there circumstances that lend themselves to captioning, that make captioning more likely to be used by news directors, and that enable captions to clarify/reinforce information? Knowing more about these attributes of captions could improve the effectiveness of public relations efforts to convey information via TV, both in terms of acceptance of a VNR by media gatekeepers and in terms of impact on the viewing audience when a VNR airs.

INFORMATION-PROCESSING THEORY

Over the last decade, many studies have posed the question: How much of TV news does the audience absorb? The findings show that viewers often remember either a distorted version of the message or little at all (e.g., Katz, Adoni, & Parness, 1977; Neumann, 1976; Robinson, Davis, Sahin, & O'Toole, 1980; Sahin, Davis, & Robinson, 1981; Stauffer, Frost, & Rybolt, 1981). To address this concern, researchers have turned to examining message structure and format characteristics to identify those that best facilitate learning.

Visual format features, in particular, have been found to affect the amount and kind of information that news viewers learn (reviewed in Berry, Gunter, & Clifford, 1981; Gunter, 1980; and Gunter, Berry, & Clifford, 1982). Visual illustrations, for example, have been found most effective when they reinforce, or are "redundant" with, the script (Drew & Grimes, 1986; Reese, 1984; Son, Reese, & Davie, 1987).

In addition to nonverbal illustration, however, the use of visual–verbal print material has become common. Captions no longer are used simply to identify newsmakers with supers, but they are widely used in titling graphics and enumerating important points in a script. However, this form of verbal reinforcement has received little research attention, and its impact on learning remains unclear.

Although many multiple-channel communication studies have tested memory for lists of words and pictures (reviewed in Hartman, 1961), a news story presents a different task than simply recalling lists of information. Stories have internal structure, and viewing them requires attending to certain parts more than others, remembering details, and trying to make sense of them. Studies examining news stories and captions have provided mixed results.

Findahl and Hoijer (1981) captioned consequences of an event in a story in order to help recall. Focusing on these contextual details was more helpful than emphasizing the event per se. Similarly, Son et al. (1987) found that recaps of a story's central point helped understanding, presumably by helping viewers isolate the essential gist of the story.

Continuous captions have been found either to impede or to have no effect on learning from news stories (Reese, 1984). This may be explained by noting the limitations of single-channel processing, a model that describes humans as capable of attending to only one channel at a time. Switching attention from one channel (spoken text) to another (written text) impairs performance when processing demands are heavy because some information is lost in the process (Broadbent, 1958; Treisman, 1969; Treisman & Davies, 1973).

However, if processing demands are reduced via noncontinuous captions,

those captions might aid viewers by reinforcing important material while not competing full time for mental resources. This would occur when the intermittent captioning causes cognitive capacity to be temporarily increased but does not overload that capacity. Findahl and Hoijer (1981), for example, showed that, when used intermittently in a story, captions do benefit viewers by directing attention and cuing recall of specific content. In the Findahl and Hoijer studies, captions (along with visualization and repetition) were considered simply another means of emphasizing certain story elements over others, bringing them to center stage, as it were. Emphasizing contextual detail (event causes and consequences) was said to have helped viewers remember the details of the event itself as well.

Captions should also be beneficial as an information-processing aid. Encoding spoken (acoustic) information represents a low-effort psychological task, which makes it more difficult to develop associative semantic links. Reading, however, requires more effortful semantic coding. As a result, Kellerman (1985) suggested that ". . . increased use of verbal representations presented visually could promote use of semantic codes" (p. 112) and thus facilitate memory.

This study examined the effect of captions using stories with film accompaniment, the industry norm, rather than using still illustrations as did Findahl and Hoijer (1981). In addition, a more realistic captioning manipulation was employed. Rather than superimposing a continuous transcript of the story, we used key word captions intermittently to emphasize story material.

In addition, this study examined the relative benefit of captions in different types of stories. A distinction was made between stories, based on the nature of the event they portrayed. One class of stories dealt with concrete, easy-to-visualize events. Such events represent one of the two main types of VNRs said to be enjoying particular success (MacColl, 1989; Spayde, 1990; "Sponsors Stretch," 1990). The other main type of VNR describes abstractions that are more difficult to visualize and relies more on words to get the point(s) across. Stories about politics, medicine, and technology fit into this category (Cohn, 1989; Compuserve Public Relations Special Interest Group, 1986; *Medialink Handbook,* 1990).

The visuals in these so-called "word" stories did not, by definition, have as much to do with—were not as redundant with—the script. Photo-opportunity shots of President Bush greeting a Russian ambassador, for example, relate only marginally to the negotiations they held. If captions help direct attention and encourage semantic processing, they should be particularly beneficial in these stories, which do not benefit as much from visual reinforcement. Their visuals, in fact, may often distract viewers from the main point of the story.

METHODS

Data were gathered in the late spring and early summer semesters of 1986, using undergraduate subjects at the University of Texas at Austin enrolled in various courses in the Department of Journalism. The experiment employed a 2 × 2 (Caption vs. No Caption × Picture Story vs. Word Story) factorial design.

Procedure

Subjects ($N = 100$) were asked to sign up for one of several possible viewing sessions (consisting of 4 to 6 subjects in each). The sessions were then randomly assigned to the four experimental conditions. No intact classes were used. This procedure approximates random assignment by keeping viewing sessions small. Each viewing session was held in a quiet classroom. The subjects were instructed that they were to participate in a study of what people learn from TV news programs and that they would be shown five different television news stories. They were told to just watch and listen to the stories as they normally would at home.

They were first shown a dummy story (Louisiana governor), which served as a check on randomization. Following that story they were instructed to turn to the first section of the questionnaire. A 1-min distractor test was administered to purge short-term memory and prevent rehearsal of story information (as in Gunter, Berry, & Clifford, 1981). Each distractor test consisted of a series of brain-teaser "pundles." For example, the first pundle, "ONCE/4:00 p.m.," was revealed as "once upon a time." Four such pundles were posed after each subsequent news story viewing.

The visual recognition test was then administered (similar to Drew & Grimes, 1986). Subjects were shown a series of seven successive visuals, or "freeze frames," on videotape, some taken from the preceding story and some taken from stories subjects had not seen (about 4 sec each in duration). As they saw each visual, they were to mark on their questionnaire whether or not the visual had been in the story they had just seen. Immediately following this test, subjects were asked about the central point of the story, which question was followed by the four immediate recall multiple-choice questions. After seeing another story the process was repeated until they had seen all five stories. Following a 2-min session of six more pundles, subjects were again shown the visuals from all five stories to identify. They then completed the delayed recall multiple-choice items from all five stories (the questions from the Louisiana governor dummy story were simply repeated). The entire session lasted about 45 min.

Development of Stimulus Materials

Story selection. Several network newscasts were videotaped in September 1985.[1] Twelve stories were selected to be pretested: Six were thought a priori to be good examples of concrete/picture stories, and 6 were thought to be good examples of abstract/word stories. In order to select the best examples and confirm this conceptual distinction, these stories were subjected to a validity check. They were shown in succession to three judges (journalism graduate students), who were also given a complete transcript of each report. After viewing the stories, they were instructed to rank the stories from most concrete to most abstract. The major distinction to be made was between stories about physical events, either recorded or reconstructed (concrete), and stories about nonvisualizable processes (abstract).

Following this procedure, eight stories were selected (four of each type) that produced the optimum intercoder reliability, percent agreement = .93 (Holsti, 1969). To compute this agreement, each judge's ranking was converted into a series of 25 separate decisions, representing each possible discrimination between the five word and five picture stories. The "correct" judgments would have ranked each picture story as more concrete than any of the respective word stories. The reported coefficient is the average percentage of agreement by the three judges across these 25 decisions.

The four concrete/picture stories selected (and their durations, given in the form min:sec) were reports on Hurricane Gloria (1:34), the Mexico City earthquake (1:40), the Delta airliner crash in Dallas (1:32), and a terrorist attack in Cyprus (1:10). The four abstract/word stories concerned AIDS (1:30), the Rainbow Warrior scandal in France (1:17), the Geneva arms talks (1:16), and South African unrest (1:40). A story about the trial of Louisiana Governor Edwin Edwards (1:27) was selected to serve as an unmanipulated dummy story.

Captioning manipulation. Some of the selected stories already contained some captioning to illustrate the main points (e.g., in the AIDS story, the drugs holding the most promise were "Suramin, Forscarnet, Compound-5, Riboviran and HPA-23," presented in sequence on the screen as the reporter read the list). Additional intermittent captions were added to each story so as to reinforce all the major details (about seven captions in each story). These were

[1]This method was used as a matter of convenience. Given the subsequent testing of the stories, drawing a convenience sample from the vast population of news stories was viewed as appropriate. The two story types correspond to two of the more common types of stories developed for VNRs, namely, medical/technical topics and coverage of events such as bass fishing contests.

similar to caption graphics used in many news stories; brief summaries of the points in the script, left onscreen just long enough to be read easily.[2]

Measures

Given that recall and understanding are distinct processes (e.g., Woodall, Davis, & Sahin, 1983), viewers may recall facts from a story without having assimilated them into a larger framework of understanding. These different capacities are measured separately in the sections that follow.

Recall. Questions were derived from story transcripts, particularly those blocks of copy that were captioned. Ten questions from each story were pretested. Students in a large introductory communications theory course, who were similar to those subjects used in the experiment, were used for this pretest in December 1985. They were administered the questionnaire after seeing all nine unmanipulated stories retained for the study. Following an item analysis, the 2 items showing the least reliability in each group of 10 were dropped. In each resulting group of 8, 4 questions were selected randomly to test immediate recall, and 4 questions were selected randomly to tap delayed recall. Additional item analysis was conducted on each block of 4 questions, and in all but a few blocks an item was dropped to further refine reliability.[3]

Visual recognition. Visual recognition was the number of correct discriminations subjects made when shown a set of freeze-frame images (as described previously). The highest score was achieved by correctly determining whether each visual was or was not in the story just seen.

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[2]In the Hurricane Gloria story, for example, the reporter's words, "there have been only four hurricanes this century as powerful," became a caption, "Only 4 this century as powerful." The captions were added so as to fit the story, either on the bottom third of the screen or using the full screen as needed. The original visuals were retained as a backdrop. In the noncaptioned version, those stories that originally contained some captions were altered to remove the captions, replacing them with appropriate video. Although some stories were shortened for the experiment, the original structure was retained, including reporter "stand-ups." However, these on-camera remarks were neither captioned nor included in the recall questions.

[3]Chronbach's alpha coefficients for each story's immediate, delayed, and total recall measures are listed here. The number of items each measure included is given in brackets. Louisiana governor: (total [4]: .60); Hurricane Gloria: (immediate [3]: .22, delayed [3]: .37, total [6]: .37); earthquake: (immediate [3]: .40, delayed [3]: .32, total [6]: .60); terrorist: (immediate [3]: .40, delayed [4]: .55, total [7]: .57); AIDS: (immediate [3]: .37, delayed [3]: .23, total [6]: .40); Rainbow Warrior: (immediate [3]: .45, delayed [3]: .67, total [6]: .71); Geneva: (immediate [3]: .54, delayed [3]: .50, total [6]: .56); South Africa: (immediate [4]: .61, delayed [3]: .48, total [7]: .65); Delta: ([Unsatisfactory reliability—dropped from further analysis] immediate [4]: .24, delayed [4]: .01, total [8]: .23); total reliability: (picture stories [19]: .68, word stories [25]: .72).

Understanding. The ability of subjects to reproduce the central point of the stories was used to operationalize understanding. Following a technique used by Sahin et al. (1981), a central point was defined as the essential element of each story, which a reporter would have wanted a viewer to gain from the story (a list of central points follows). We coded subjects' open-ended responses according to correspondence between response and central point. We then compared the codings of a subset of responses and achieved a reliable agreement (percent agreement = .80).

1. Hurricane Gloria: South Carolina and Virginia residents awaited the arrival of the worst storm ever to threaten the east coast, a storm that could have threatened states as far as Maine.
2. Earthquake: Foreign rescue teams were searching for Mexico City earthquake survivors but were encountering many obstacles.
3. Terrorists: Gunmen had seized an Israeli yacht in Cyprus, killing three on board before surrendering to Cypriot and Egyptian authorities.
4. Delta 191: Transcripts of the final minutes before the Delta crash in Dallas showed that the pilots saw the thunderstorms but could not fight the effects of wind shear.
5. AIDS: Scientists were testing hundreds of drugs designed to inhibit the AIDS virus, which initially infects the brain before migrating to the rest of the body.
6. Arms Control: The Soviet foreign minister outlined a new arms control proposal to be presented in Geneva, although the administration insisted its "Star Wars" defense plan would continue.
7. Rainbow Warrior: The French prime minister blamed the former defense minister and secret service chief in the sinking of the Greenpeace "Rainbow Warrior" ship.
8. South Africa: President Botha presented a plan for Apartheid reform, responding to increasing pressure from the business community, which was hurting from a Black boycott.

RESULTS

Analysis of variance (ANOVA) was used to detect any significant differences among the four groups on the dependent variables.[4] Results indicated that total (across all stories) combined (immediate and delayed) recall showed a main

[4]To test the equivalence of the four groups, the groups were compared on their recall of information in the Louisiana governor story. ANOVA results showed that there was no significant main effect for the captioning factor, $F(1, 96) = 2.19$, $p = .142$. There was a significant main effect, however, for the story type factor, $F(1, 96) = 5.70$, $p = .019$). This would have been a concern if hypotheses were being tested regarding the relative memorability of the two types of

effect for the captioning factor, $F(1, 96) = 4.20$, $p = .043$ (captions = .70, no captions = .62) but none for story type, $F(1, 96) = 1.59$, $p = .21$ (word = .64, picture = .68) or for the interaction between the two factors, $F(1, 96) = 1.07$, $p = .31$. A similar analysis of total recall showed a significant main effect for captioning on immediate recall, $F(1, 96) = 3.96$, $p = .049$ (captions = .73, no captions = .64) but not on delayed recall, $F(1, 96) = 2.49$, $p = .118$ (captions = .58, no captions = .51). So, overall, captioning had a positive impact on recall.

Next, differences were examined within the two story types. As seen in Tables 1 and 2, captions enhanced recall in the word stories, whereas they did not appear to do so in the picture stories. *T*-test comparisons show three significant differences (below the .05 level) among the immediate and delayed recall measures for the word stories, but no significant differences among the picture stories. The total immediate and delayed recall scores show this more clearly. Among those subjects viewing the word stories, those seeing the captioned versions showed greater immediate, delayed, and total recall than did

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stories (picture vs. word). However, it was not considered a threat to validity in this case, given that the effects of captions were at issue, and their "relative" effect on the two types of stories was being evaluated.

TABLE 1
Cell Means: Effects of Captions on Recall From and Understanding of Word Stories

Story	*AIDS*	*Rainbow Warrior*	*Geneva Talks*	*South Africa*	*Total*
Immediate recall					
Caps	.73	.71**	.77*	.77	.75*
No caps	.73	.46	.55	.71	.62
Delayed recall					
Caps	.73*	.58	.36	.35	.51*
No caps	.57	.40	.37	.34	.42
Combined recall					
Caps	.73	.64*	.68	.72	.69*
No caps	.65	.43	.61	.64	.59
Visual recognition					
Caps	.88	.89	.75	.92	.86
No caps	.85	.85	.78	.90	.84
Understanding					
Caps	.73	.45	.45	.41	
No caps	.57	.54	.43	.50	

Note. Recall values are mean proportions of correct responses. Understanding values are means on a 3-point scale, where 0 = *no understanding*, 1 = *some understanding*, and 2 = *full understanding*.

*$p < .05$, two-tailed. **$p < .01$, two-tailed.

TABLE 2
Cell Means: Effects of Captioning on Recall From and Understanding of Picture Stories

Story	*Hurricane*	*Earthquake*	*Terrorists*	*Total*
Immediate recall				
Caps	.68	.81	.64	.71
No caps	.71	.68	.67	.68
Delayed recall				
Caps	.51	.81	.74	.69
No caps	.51	.65	.74	.63
Combined recall				
Caps	.60	.81*	.70	.70
No caps	.61	.67	.71	.66
Visual recognition				
Caps	.90	.85	.82*	.86
No caps	.92	.89	.90	.90
Understanding				
Caps	.71*	.33*	.42	
No caps	1.12	.65	.62	

Note. Recall values are mean proportions of correct responses. Understanding values are means on a 3-point scale, where 0 = *no understanding,* 1 = *some understanding,* and 2 = *full understanding.*

*p = .05, two-tailed.

those seeing the uncaptioned stories, $t(48) = 2.43$, $p = .019$; $t(48) = 2.31$, $p = .025$; and $t(48) = 2.31$, $p = .025$, respectively; all two-tailed tests.

Captioning had no significant overall main effect on understanding. However, when the story types were examined separately, significant comparisons did emerge. Captioning did not significantly affect understanding of the word stories, but in two of the three picture stories (Hurricane Gloria and earthquake) it actually impeded understanding (see Table 2). The difference in the terrorist story was not significant but was in a direction consistent with the other two.

As seen in Tables 1 and 2, memory for story visuals was uniformly high. However, ANOVA results did show significant differences. A main effect for story type, $F(1, 96) = 4.11$, $p = .045$ (word = .85, picture = .88) showed that the picture stories were at least visually more memorable. Although there was no significant captions effect, $F(1, 96) = .73$, $p = .40$ (captions = .86, no captions = .87), the interaction between story type and captioning was significant, $F(1, 96) = 3.99$, $p = .049$. Although the differences are not great, the means in the tables show that captions tend to wash out the natural differences between picture and word stories.[5]

[5]There were no appreciable differences between delayed and immediate visual recall, so only immediate visual recall scores were discussed further.

DISCUSSION

Captions did improve recall for the abstract/word stories, but they did not seem to make much difference among the concrete/picture stories. In fact, captions impeded viewer understanding of the picture stories. The beneficial captioning effect on recall suggests that making captions intermittent both lowers the processing demands on viewers and permits the captions to highlight key details rather than serving as a distraction. This fits well with the practice of limited captioning by VNR producers and suggests that only occasional captioning would be less taxing of cognitive capacity while enhancing memory performance.

In the word stories, the visual illustration could not, by definition, illustrate abstract concepts, as it could in the graphic, picture stories. Therefore, captions in word stories provide both an additional source of redundancy and cues to help override the potentially distracting visuals.

The differing impact of captions on understanding and recall points out the importance of examining those two categories separately. As seen here, captions can benefit recall but not understanding, as in the word stories. Although captions had no effect on recall from picture stories, they did impede understanding of two of those three reports. The results for understanding are consistent with those reported in Reese (1984), which showed lowered understanding (measured the same way) of a captioned version of a story about El Salvador guerrillas (which we in this study would have defined as a picture story).

Captions may have impeded understanding of the picture stories by distracting attention from the visuals. Captioning reduced visual recognition from the picture stories, suggesting that a distraction process did occur. This confirms what may be considered intuitively obvious: Pictures are important in helping viewers understand stories we consider essentially picture stories. Captions may work against viewers' understanding of these picture stories by highlighting details throughout a story. This may obscure the real gist, or main point, of the report, leading viewers to assimilate the entire story, as if each detail were as important as the next. This may prevent a more holistic, integrated comprehension.

A more judicious highlighting of critical points seems more appropriate. In light of these findings, public relations practitioners might even direct their contracted VNR producers to eliminate use of captions entirely for coverage of events such as client-sponsored sports competitions.

In addition to considering the story type of the VNR, practitioners must also decide whether understanding or memory is the paramount objective. Based on the evidence here, a captioning strategy causes borrowing of one mental capacity (comprehension) to enhance another capacity (memory). When memory is the main objective, such as memory for the VNR's sponsor,

use of a caption incorporating the sponsor's name would be effective in a newsworthy VNR on an abstract/word subject such as technical information about testing of an AIDS drug.

By contrast, when public information is presented to clarify circumstances, such as crisis communication during or following a disaster, then understanding may be paramount, and captioning might best be omitted. The corporate spokesperson would attempt to convey a sense of the situation to TV viewers, with less emphasis given to details that would be offered in conjunction with captions.

This noncaption strategy as a means to enhance understanding would be doubly effective in a VNR depicting an ongoing crisis. Not only would the public relations person most desire to enhance understanding at the possible expense of memory for details, but the VNR might include visual illustration of action on the part of the organization. For example, a concrete/pictorial message, such as video footage of Forest Service smokejumpers fighting a wilderness fire, could be used to obtain public understanding of the earnest effort to save property and lives. Captioning, based on the findings here, would run counter to the emphasis on public understanding in such an instance.

It is believed that news directors intuitively use caption graphics for difficult subjects, such as medical/technical topics. Use of captions with judicious, perhaps a single, mention of the sponsoring organization might be better received in VNRs dealing with technical aspects of a topic. In developing strategy, then, public relations practitioners might choose to present technical aspects of a topic to enhance acceptability of captioning; such captioning could include limited captions favorable to the sponsor's position or could include the sponsor's name. The technical topic would invite captioning as a means of enhancing memorability, both of the abstract/word story and incidentally of the sponsor's message. The platitude of public information officers ("keep it simple stupid") may be replaced with "keep it complicated" and use captions that tell your story.

This study evaluated processing of captions, thereby adding empirical insight to speculative prescriptions about how VNRs should be produced for maximum intended effect. Having established some indication of appropriate topic and frequency of captioning, the further question of acceptability of a captioning strategy should be addressed. Gatekeeper studies of station use of VNRs, similar to the study by Courson (1988), could include content analysis by topic, level of difficulty, presence of captions, and mention of sponsor in captions. A related policy issue is the question of whether or not stations should disclose all sources of tape used in broadcasts, providing captions mentioning the sponsor of the material as a matter of course. Both a survey of station disclosure policy and a test of how such source disclosure would affect viewer attitudes and information processing are in order.

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