

Trigger videos on the Web: Impact of audiovisual design

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Abstract

Audiovisual design might impact emotional responses, as studies from the 1970s and 1980s on movie and television content show. Given today's abundant presence of web-based videos, this study investigates whether audiovisual design will impact web-video content in a similar way. The study is motivated by the potential influence of video-evoked emotional responses to related activities in a web-based learning environment. To examine this, a video scene was designed that follows the concept of an educational trigger video. A trigger video aims to evoking affective responses in viewers with respect to a social problem situation. An experiment was conducted that explored whether the manipulation of two audiovisual design variables—shot length and camera height—of a web trigger video affects how the problem situation and the characters are perceived. The results showed that audiovisual design did impact these video-related tasks.

Introduction

The increased use of web video has caused a resurgence of interest in the use of video for educational purposes. New video applications occur as an integral part of multimedia-based teaching. Related video design should suit today's learners, who are comfortable in image-rich environments, have a need for interactivity, are emotionally open, and show a preference for activities that promote and reinforce social interaction (Crittenden, 2002; Oblinger & Oblinger, 2005). This coincides with the increased attention paid to the role of emotion in learning (Pekrun, 2005). Video's rich symbol system may serve to nurture motivations and feelings as one of the categories for video-supported learning (Koumi, 2006).

A recent study of Verleur, Verhagen and Heuvelman (2007) indicates that affective video clips presented in a web environment can induce affective responses in learners, including mood changes. Moreover, this study finds evidence that induced affective feelings had an impact on problem solving tasks that followed the video clip. In this case, the subsequent tasks were unrelated to the video content. However, in purposefully designed web-based learning activities, video materials are related to or integrated with the task (Collis & Peters, 2000).

One well-known use of task-related video that exploits the affective potential of video is the trigger video. A trigger video aims at evoking affective responses to a presented situation (Boud & Pearson, 1979; Cyrs, 1997; Rushby, 1987). The brevity of trigger videos complies with the interactive demands of today's learners; video is best shown in short segments to maximise learners' ability to concentrate (Shephard, 2003). The trigger video does not provide resolutions

to a portrayed problem; rather, it ends in a climax, in order to maximise, or trigger, affective responses in the viewer. As viewers are affected by the issue, they become motivated to reflect upon the problem situation and consider possible solutions. The old *trigger film* has therefore a clear potential to be revived as a *web trigger video* to emotionally engage learners in an e-learning environment.

The aim of the present study is to explore how task-related affective video materials—specifically, trigger videos—might influence the perception of the video content, ie, the problem vignette, and subsequent activities in a web-based environment.

Audiovisual design of the trigger video

Designers of trigger videos are advised to employ audiovisual design or production techniques to maximise or emphasise the *emotional impact* of the scene (Rushby, 1987). When, as is often the case in a trigger video, the video content contains a *social interaction between two persons*, interpersonal theory may provide some helpful insights in selecting appropriate audiovisual design techniques for portraying such a situation. Interpersonal theory proposes that the way in which people relate to each other can be described in terms of their social space along two dimensions or axes of human relatedness—the horizontal and the vertical axis (Birtchnell, 1996). The horizontal axis describes the relative distance between persons, also referred to as the friendliness or affiliation dimension (Argyle & Dean, 1965). Meyrowitz (1986, in Messaris, 1997) argues that the viewing distance in visual media is comparable to interpersonal distance in real-world interaction. The vertical axis refers to the relative strength of the persons involved. This is comparable to the dominance dimension (Argyle & Dean, 1965). Camera height also referred to as the vertical camera angle, can be employed to signify the social power or relative strength of mediated persons (Millerson, 1999).

Close-up or proximity

Argyle (1967) has pointed out that the face and body reveal different aspects of a person's emotions. Whereas bodily gestures and posture provide information about a person's emotional arousal state, facial expressions are better at revealing the type of emotion. Like real-life interactions, a close-up shot may have two potential effects: a threatening effect in a negatively valenced interaction context, or an intimacy effect in a positively valenced interaction context (Persson, 1998). Reeves, Lombard and Melwani (1992) vary the perceived distance between the viewer and video portrayals of persons with three within-subject factors: image size, viewing distance and camera shot length. Following Schiffenbauer and Schiavo (1976), they hypothesise that when social distance is shortened, the intensity of the responses will increase. The study shows that the perceived emotional valence responses were intensified: on-screen persons were judged more extremely on perceived happiness/sadness in close-up shots compared to long shots. Reeves *et al.* (1992) also find that close-up shots, compared with long shots, resulted in more extreme evaluations, ie, more positive or negative evaluations, of the persons portrayed.

For the study, a trigger video is used that concerns a developing conflict between two persons, of whom one is the main character. The hypothesised impact as a result of the intensifying effect of close-up shots, as compared with a neutral portrayal, is formulated as follows:

Hypothesis 1: A close-up of the main character results in a more extreme perception of the main character's emotional valence responses (*valence* refers to the positive/negative dimension of emotion).

Hypothesis 2: In close-up, the main character will be rated more extremely on perceived personality.

Camera height or relative strength

Several studies suggest that the viewing angle may affect the perception of the portrayed person's emotions. Faces are perceived as more positive or *happier* and less negative when seen from a low

angle, whereas faces seen from a high angle are perceived as less positive and more negative or *sadder* (see Kappas, Hess, Barr & Kleck, 1994; Mignault & Chaudhuri, 2003; Shoemaker, 1964, as cited in Kraft, 1987, p. 292).

The effect of camera angle on person perception is commonly examined for one on-screen person. Studies generally indicate that characters shot from low angles are evaluated as more dominant compared with high-angle shots (Mandell & Shaw, 1973; Shoemaker, 1964, as cited in Kraft, 1987, p. 292). In a study conducted by Kraft (1987), the effects of camera manipulation on the perception of *two* characters is examined, which is relevant for the two-character format in the present study. The stimuli in Kraft's study are six picture stories, each containing four stills. The camera angle affected the subjects' evaluations of physical and personal characteristics of the portrayed persons on five out of six scales: short/tall, weak/strong, afraid/unafraid, timid/bold and passive/aggressive (the good/bad scale was the exception). Kraft (1987, p. 295) concludes that the 'camera angle strongly defined the relative roles of the two characters in each story.'

McCain, Chilberg and Wakshlag (1977) argue that video normally does not consist of a single shot from one camera perspective. Therefore, they manipulate both camera height and shot length to explore the effects of a montage or sequence of varying camera angles. The most frequently used angle of the sequence is labelled the preponderant angle. Again, higher angles made the on-screen person seem more sociable. Interestingly, they also examine the effect of camera angle on *character* perception. A higher angle resulted in higher (more positive) character scores, as measured by the following characteristics: selfish-unselfish, sympathetic-unsympathetic, kind-cruel and virtuous-sinful. This effect, however, only occurred in the medium-shot version, thus demonstrating an interaction effect between camera angle and camera shot length.

For the trigger video study, the hypothesised impact of portraying the main character in high-angle medium shots and the second character in low-angle close-ups, as compared with a neutral portrayal, is formulated as follows:

Hypothesis 3: (a) The main character will be rated as more negative (sad) and (b) the second character will be rated as more positive (happy).

Hypothesis 4: (a) The main character will be rated as more submissive and more positive on personality evaluations and (b) the second character will be rated as more dominant and more negative on personality evaluations.

In addition, the previous discussions provided input to examine the following research questions (RQs):

RQ1: Does audiovisual design influence the relative roles of the characters, or, more specifically, does the audiovisual design for the main character result in different perceptions of the personality of the second character?

RQ2: Does audiovisual design influence the perception of the problem situation as indicated by viewer selections of solutions to the problem situation that is presented in the web trigger video?

Research method

For this experiment, a one-factor between-subjects experimental design is used with audiovisual design (camera manipulation) as the factor, and 123 university students (66 female and 57 male, mean age = 20.6 years) participated. Gender was balanced across conditions. The experiment was part of a course that introduces the field of media psychology.

Trigger video story

The trigger video was based on a written real-life problem vignette (Mraz & Runco, 1994) in which someone is distracted by a friend during a lecture class. For practical reasons, the class

setting was changed to a library setting. The trigger video opens with the main character, a male student named Ralph, who is studying in a quiet study (library-like) environment. Then, the second character Ron, a friend of Ralph, enters the room very enthusiastically and loudly sits down with him. Ralph says hello but informs Ron that he is studying for an exam. Ron initially appears to accommodate him, but he continues to talk to him and even comes up with photos of a field trip they have recently gone on. Ron's behaviour clearly disturbs Ralph more and more. The story ends at the climax of Ralph's rising irritation, at the point where he is about to react. The way he will respond is left open to the interpretation of the viewer.

Independent measure: camera manipulation

The trigger video story was developed into three video versions for the experiment: the close-up (proximity) version, the dominance version, and the neutral version. All versions had a presentation length of approximately 50 seconds. The neutral version uses medium shots for both characters in the entire scene that follows. The close-up version uses close-ups only for Ralph in order to emphasise his emotional expressions. In this case, the final shot is an extreme close-up. The dominance version uses high-angle medium shots for the main character to emphasise his submissiveness/weakness. This version uses low-angle close-up shots of the second character to emphasise his dominance/strength through both angle and shot length. Figure 1 presents an overview of typical shots used in the three web-trigger video designs.

Dependent measures

The dependent measures in this experiment are the perceived emotional valence response, the perceived personality of the characters in the trigger video and the perceived problem situation.

Perceived emotional valence response

Participants were asked to judge the emotional valence responses of the *characters* in the trigger video using the Self-Assessment Manikin (SAM). SAM is a visual scale that represents an emo-

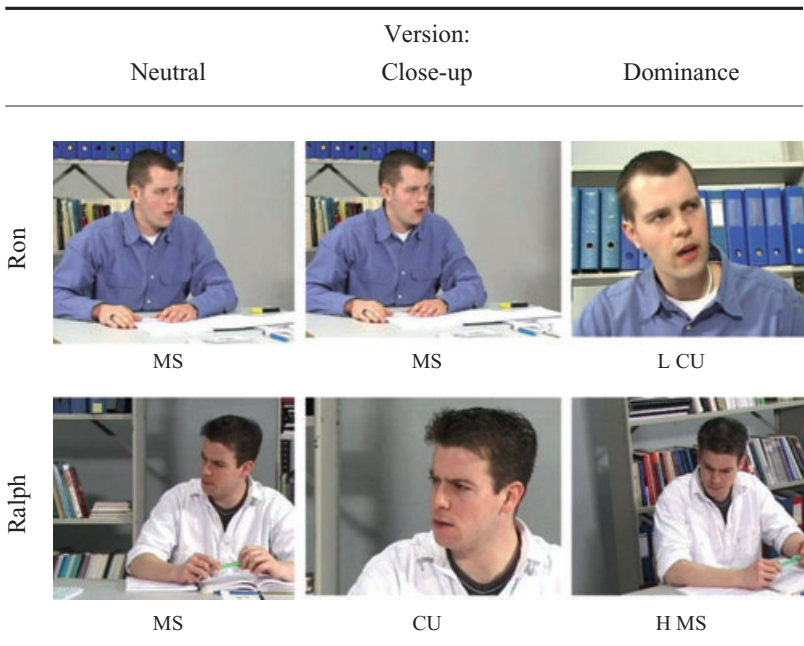


Figure 1: Representative shots of the three web-based trigger video designs



Figure 2: Screens from the web environment. Left: Video window displaying the library problem. Right: Questionnaire presented afterwards

tional response to a stimulus with respect to three dimensions: valence, arousal and dominance (Bradley & Lang, 1995). SAM reflects each dimension with a graphic character arrayed along a continuous 9-point scale. For valence, SAM ranges from a smiling happy figure to an unhappy figure.

Perceived personality of characters

The two basic dimensions of personality of media characters are dominance and friendliness (Reeves & Nass, 1996). Two items, using a 9-point semantic differential scale, scored directly for these two dimensions (ie, dominant/submissive; friendly/unfriendly). For exploratory purposes, both scales were embedded in a list together with 16 additional personality items that were based on Cattell's 16 most important personality factors (Cattell & Cattell, 1995). The factors are warmth, reasoning, emotional stability, dominance, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, abstractness, privateness, apprehension, openness to change, self-reliance, perfectionism and tension. The factors were translated to Dutch and transformed into sixteen bi-polar items using a 9-point semantic differential scale.

Perceived problem situation

This dependent measure was used to examine whether audiovisual design may also have an impact on the perception of the problem situation presented in the web trigger video (RQ2). A multiple-choice question provided possible solutions to the problem. Solutions included representatives of the five main styles in conflict handling: integrating, obliging, dominating, avoiding and compromising (Rahim & Magner, 1995). In addition, an indication of the emotion felt by the main character was incorporated (eg, an *angry* reaction or a *friendly* reaction). This resulted in a list of 12 possible reactions for the main character, from which subjects had to select the most obvious one at the climax of the conflict (see also Table 2).

Procedure

The experiment was conducted simultaneously in two university computer rooms that each comprised 20 individual computer workstations with 17-inch monitors. The experiment was carried out on one day in five rounds. Participants were randomly assigned to one of the three conditions. An experimental session lasted approximately 25 minutes. The experimental procedure and the instruments (questionnaires) were automated into a web-based environment. Figure 2 shows two screens from the web-based environment.

The left side of the figure shows the video clip of the library problem displayed in a video window. The right side of the figure shows the web page with the questionnaire. This experimental web environment ran from a local drive of the computer in order to be independent of web servers and

to control for technical smoothness of presentations. Data were collected online using a local area network.

Results

The close-up (proximity) version: impact of camera shot length

A Mann–Whitney test showed that the main character was indeed perceived as significantly more negative or unhappy in the close-up version (mean rank = 46.80) compared with the neutral version (mean rank = 34.76), $Z = -2.47$, $p = 0.007$, as measured by subjective reports on the SAM valence dimension. This result supported the proposed intensifying effect of close-up shots presented in Hypothesis 1. Mann–Whitney tests indicated that for the two basic personality dimensions—friendliness and dominance—no significant differences were found when the close-up version was compared with the neutral version, respectively, $Z = -0.71$, *ns* and $Z = -0.32$, *ns*. Hypothesis 2 was thus not supported by the results for basic personality dimensions. For the personality items based on Cattell, 3 items out of 16 produced significant effects. In the close-up version, the main character was rated as significantly more emotionally reactive (mean rank = 34.19) than in the medium shot (mean rank = 48.33), $Z = -2.75$, $p = 0.003$. In addition, the main character was rated as significantly more wilful (mean rank = 35.21) in the close-up version compared to the medium shot (mean rank = 47.23), $Z = -2.38$, $p = 0.009$. Finally, the main character was perceived as significantly less restrained (mean rank = 36.92) in the close-up version compared with the medium shot (mean rank = 45.40), $Z = -1.67$, $p = 0.05$.

The dominance version: impact of combined camera height and shot length

Mann–Whitney tests indicated that the *main character* was perceived as significantly more negative or unhappy in the dominance version (mean rank = 48.29) compared with the neutral version (mean rank = 33.15), $Z = -3.06$, $p = 0.001$, as measured by subjective reports on the SAM valence dimension. This result supported Hypothesis 3a. The mean rank of emotional valence responses for the second *character* was about the same in both the dominance and the neutral version (40.46 and 41.58, respectively). The camera manipulation had no effect on the perceptions of the second character's emotional valence responses, $Z = -0.22$, *ns*. Hypothesis 3b was therefore not supported by the data.

Mann–Whitney tests indicated that for the *main character*, no differences were found on the basic personality dimension of dominance between the dominance version (mean rank = 41.10) and the neutral version (mean rank = 40.90), $Z = -0.04$, *ns*. The camera manipulations did not make the main character appear more submissive, as Hypothesis 4a predicted. Although the main character appeared more positive (friendly) on the basic personality dimension of friendliness in the dominant version (mean rank = 37.69) compared to the neutral version (mean rank = 44.56), this difference did not reach significance, $Z = -1.35$, $p = 0.09$. In line with Hypothesis 4b, the second character was perceived as significantly more dominant on this basic personality dimension (mean rank = 49.69) than in the neutral version (mean rank = 31.64), $Z = -3.58$, $p = 0.000$. In addition, he appeared more negative (unfriendly) on the basic personality dimension of friendliness in the dominant version (mean rank = 44.70) compared with the neutral version (mean rank = 37.01). This difference approached significance, $Z = -1.49$, $p = 0.07$.

Impact of trigger design on relatives roles

Since the close-up version only differs from the neutral version in the design of the main character (respectively, in a close-up or in a medium shot), these versions were compared with examine whether the experimental audiovisual design would result in different perceptions of the second character's personality (RQ1). In both versions, the second character is presented in medium shots. The second *character* was rated as more dominant on the basic personality dimension in the close-up version (mean rank = 48.88) compared to the neutral version (mean rank = 32.51),

Table 1: Effects of main character close-ups on the second character's perceived personality

Perceived personality (items based on Cattell)	Neutral version	Close-up version				In close-up version, second character (in MS) is perceived as:
	Mean rank (n = 39)	Mean rank (n = 42)	Z	p		
• Warm/reserved	45.82	36.52	-1.85	0.065		More reserved
• Sensitive/utilitarian	47.15	35.29	-2.32	0.021		More utilitarian
• Tense/relaxed	47.17	35.27	-2.38	0.017		More relaxed
• Self-assured/apprehensive	48.94	33.63	-3.00	0.003		More self-assured
• Lively/serious	36.41	45.26	-1.78	0.075		More lively
• Hesitant/uninhibited	35.45	46.15	-2.14	0.032		More uninhibited

Table 2: Selected conflict categories for the expected main characters subsequent action

Question at the climax of the conflict: 'What is the most likely way for Ralph to respond'?

Behavioural options for Ralph presented in a selection list (between the brackets is the frequency of a selection).

Avoiding ($f = 17$):

1. He ignores Ron in the hope that he will get the hint ($f = 3$)
2. He ignores Ron to prevent a quarrel ($f = 0$)
3. He uses an excuse to leave to study somewhere else ($f = 8$)
4. He leaves angry ($f = 6$)

Obliging ($f = 2$):

5. He lets Ron tell his story and hopes that he will be able to study afterwards ($f = 2$)

Compromising ($f = 19$):

6. He suggests Ron show him just a few photos, so he will be able to study quickly afterwards ($f = 19$)

Integrating ($f = 4$):

7. He expresses what he finds/feels and suggests that Ron look at the photos another time ($f = 4$)

Dominating ($f = 80$):

8. He explicitly ignores Ron to make Ron finally stop or leave (10)
9. He stays friendly but demands Ron to stop or leave (24)
10. He becomes angry and demands Ron to stop or leave (46)
11. He becomes aggressive and demands Ron to stop or leave (0)
12. Else, namely ... (0)

$Z = -3.24$, $p = 0.001$. Additionally, for 4 out of the 16 personality items based on Cattell, perceptions of the second character changed significantly as a result of the close-up used for the main character. For another two items, this change approached significance. Table 1 provides an overview of the significant effects related to the perceived personality of the second character.

Impact of trigger design on perceived problem situation

RQ2 explored whether trigger designs result in different perceptions of the task and lead to different subsequent actions as selected by the viewers. Table 2 presents an overview of the scores for the five main conflict styles (data for one of the 123 participants were excluded from the analysis, as the answer was unclear). Based on the conflict situation that the trigger video showed, the most likely actions taken by the main character at the video's climax were of the *dominating* conflict style: demanding, either in a friendly or in an angry way, that the second character be quiet or leave the room. Trigger video design had no impact on the conflict style that was selected, chi-square (8) = 6.27, *ns*.

Emotional valence in description of subsequent action

This additional analysis explored the potential role of emotional valence in the task's content itself. The main character's actions were categorised as negative when the action descriptions

Table 3: Crosstab for expected main characters subsequent action categorised by valence

Emotional valence of subsequent action	Trigger video version		Total	Dominance
	Neutral	Close-up		
Negative	14	25	26	65
Positive	25	17	15	57
Total	39	42	41	122

Negative action = 1, 2, 4, 8, 10, 11; positive action = 3, 5, 6, 7, 9 see Table 2.

contained a negative emotion (being angry) or were likely to have negative social connotations (being demanding and ignoring the other). Similarly, positive messages were the action descriptions that contained a positive emotion (being friendly) or were likely to have positive social connotations (being accommodating in ways such as compromising and excusing oneself). When the versions were compared, it was found that the (emotional) versions with camera manipulations (the close-up and dominance version) produced higher selections of negatively-valenced actions, whereas positively-valenced actions were more often selected in the neutral version (see Table 3). A Pearson chi-square test indicated that the differences were significant, chi-square (2) = 7.08, $p = 0.03$.

Discussion

In this study, we addressed the question whether audiovisual design influences viewer responses to (trigger) video content and related task activities when both are presented in a web-based environment. Three web trigger versions were developed, a neutral version in which both characters were presented in medium shots at eye level and two experimental versions. The close-up (proximity) trigger version was created to examine the impact of camera shot length. It was compared with a version that used medium shots for the main character. For camera shot length, we found support for the intensifying effect of close-ups; for the perception of the main character’s emotional valence response, a convincing intensifying effect was observed (Hypothesis 1a). For the personality perception (Hypothesis 2), there was no effect on the two basic personality items. Camera height and shot length were combined in the dominance version to emphasise the inequality in status between the two characters to maximise the impact on the perceptions of the two characters’ relative roles in the trigger video. The results of our experiment showed that the predicted effects on the perceptions of emotional valence state only occurred for the main character (supporting Hypothesis 3a); this character seemed unhappier when portrayed in high-angle medium shots. The predicted effects on personality perceptions were only present for the second character (supporting Hypothesis 4b); his dominance was emphasised by portraying him in low-angle close-up shots.

For the use of trigger videos in a web-based learning environment, a central question is whether audiovisual design affects the perception of the scene and post-video activities (eg, Cyrs, 1997). The previous discussion showed that design has an impact on the perceived emotional responses and personality of the characters and thus influences the perception of the scene. Additionally, the present study found strong support for an impact on the *relative roles* as measured by personality evaluations (RQ1). Both the basic dominance dimension and several Cattell items changed significantly when the audiovisual design for the main character was changed (eg, the second character who is portrayed in a medium shot appears more dominant, reserved, utilitarian, relaxed, self-assured, lively and uninhibited when the main character is shot in close-up). The audiovisual design chosen for one character might therefore have a strong influence on other characters in the scene, as proposed by Kraft (1987) in a study using still photographs.

Does audiovisual design also influence the perception of the problem situation, as indicated by viewer selections of solutions to the problem situation that is presented in the web trigger video? Based on the item-selection list for assessing the main character's most likely course of action, no differences were found between the trigger video versions. A limitation of the present study was, however, that a preset list of items was used. Different methods, like using open-ended answer formats such as fill-out forms or capturing thought processes by using thinking-out-loud protocols, might provide more insight into the influence of the audiovisual design of triggers on the processing of subsequent activities. In addition, the specific language used in provided answers might indicate a possible impact of affect (eg. Beukeboom, 2003).

In the additional analyses, we thus explored a possible impact on task activities using an alternative method. It was explored whether audiovisual design did have an impact on scene interpretation when looked at from an action-valence perspective. Conditions with camera manipulations (the close-up and dominance version) showed more negatively-valenced selected actions, whereas positively-valenced actions were more often selected in the neutral trigger condition. Overall, the emotional designs appeared to influence the interpretation of the scene, generally in an *affect-congruent* way; a more negative designed clip resulted in a more negative interpretation of a person or the situation in the trigger video. This conforms to the main findings from mood and cognition research (Martin & Clore, 2001). The results also suggest that the audiovisual design of web video might unconsciously influence one's affective state and act as an information cue for the interpretation of the video content (Schwartz, 2001) and thus influence related task activities.

In all, designers of trigger videos are rightly advised to use audiovisual design or production techniques to maximise or emphasise the emotional impact of a scene (Rushby, 1987). As the present study has shown, design not only has an impact on the emotional layer of the scene but also impacts the perceptions of the characters and, more precisely, their relative roles in affective web video. Even though the present study was limited to the use of one video story designed in three different ways, and a limited set of subsequent activities, it does indicate that audiovisual design influences viewer responses to (trigger) web-video content and may have an impact on related task activities when both the video and the activities are presented in a web-based environment.

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