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Exploring the Impact of Film's Rhythm and Viewer's Construal Level on the Film Viewing Behavior: Evidence from an Eye-Tracking Methodology

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Summary

The motion picture has become an important part of communication in modern life. Many studies have shown that our viewing behavior is affected by stimuli and mental status on a static image. Little is known about the effect of dynamic characteristics of a video and a viewer's internal status for viewing moving images. In general, there are two approaches to study this issue. One is similar to semiology, depicted the meaning of the image content and shot for audience from an expert's perspective. The other is similar to the empirical aesthetic approach. This approach tries to describe the relationship between a viewer's psycho-physiological status and the content or dynamic characteristics of a film while viewing naturally.

Although some psychological studies research this topic recently, the most important factor of film and a viewer's mental status affecting viewing was not found. This may due to the psychological researchers don't grasp the essence of film, and the film researchers are not familiar with the psychological measurements and appropriate relevant methods to study this topic.

Film rhythm as a life-breath of the film is the key feeling of a layman. Construal levels as a personal mindset may affect the way of film viewing. The purpose of this study was to explore a relationship among viewing behavioral characteristics, film rhythm, and construal level of a viewer via eye-tracking paradigm.

We conducted an eye-tracking experiment using an eye-tracker with 500 Hz sampling rate. The stimuli included 18 movie clips, 9 fast and 9 slow rhythm of clips. Each clip had two minutes

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duration. Sixty participants were separated into two groups according to their BIF (Behavior Identification Form) scores. One is the concrete thinking group (lower-level construal), and the other is an abstract thinking group (higher-level construal). After viewing each clip, each participant was asked to evaluate the clip on a 4-question survey. The four questions were "the degree of screen change," "the compactness of plot," "wonderfulness of content," and "willingness to keep watching" with 10-point Likert scale for manipulation check.

The correlation between the cuts of film clip and the corresponding average evaluation of the 4 questions is significant. It indicated that manipulation of rhythm is effective. Furthermore, we calculated the total fixation time, the total number of fixations, the average fixation duration, the total blink time, the total number of blinks, the average blinking duration, the total saccade amplitude and the average saccade amplitude to explore the potential mechanisms. We calculated the uniform indexes to discriminate the homogeneity of fixation distribution from the screen center on each frame. The dispersion indexes were also created for each frame within one minute to manifest the effect of rhythm and construal level on fixation distribution.

The dynamic heat maps showed that face is always the focus of the film, such tendency is the same as static viewing. But the face of an actor in motion is more salient than other faces presented on the same time. When the focus of fixations concentrated clearly, participants took about 250-600 ms to shift from previous focus to the next one. The panning shot, instead of directing the attention of the viewer, always increased the dispersion of fixation and can't produce attentional synchrony. The phenomenon of attentional synchrony was always stronger in fast rhythm film viewing condition than the slow one.

The ANOVA results showed that rhythm had a main effect on both the total blinking time and the average blinking time, but not on the average fixation time. On the contrary, construal level had a main effect on both the total fixation time and the average fixation time, but not on the average blinking time. In other words, rhythm may affect the blinking status more instantly than fixation, while construal level affected the fixation status more instantly than blinking. The findings from the current research suggested a possibility that there are two mechanisms co-existing, one for the rhythm processing and the other for the construal processing. The formal was triggered by the external stimulus. The latter was triggered by the internal state.

We also have identified two different viewing modes changing with rhythm successfully. One is a long gaze duration, short blinking, and more concentrated actor-biased distribution mode for the fast rhythm film viewing. The other is a short gaze duration, long blinking, and more homogeneous dispersive fixation distribution mode for the slow rhythm viewing.

A viewer's construal level has the similar effect. The lower-level construal produced a long gaze duration, short blinking, and more concentrated centre-biased fixation distribution. The higher-level construal produced the short gaze duration, long blinking, and more dispersive fixation distribution. According to the significant interaction effect of rhythm and construal level on fixation, it appeared that the faster the rhythm is, the more similar the viewing mode is, regardless of the construal level. Fast rhythm would inhibit the higher, more abstract level construal processing.

These results correspond to the film theory proposed by Andrew Bazin (1985/1995), which proposed the long take shot may initiate viewer's deeper thinking and imagination than montage. Results also implied that rhythm of a film may have psychological reality, and it is possible to attract attention and elucidate (or inhibit) deeper processing by changing the rhythm.