

Split Attention Problems in Interactive Moving Audiovisual Texts

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ABSTRACT: New interactive media works based upon moving audio-visual material often result in distraction rather than sustained engagement. Using Dual Coding theory, Cognitive Load theory, and Constructivist Narrative Film Theory, this study claims that distraction results from split attention problems generated by these works. Analysis of several new media works, particularly "Interactive films", instantiates these claims. For interactive moving audio-visual works to sustain deep wide ranged engagement, multi-tasking split attention problems have to be avoided or managed.

KEYWORDS: Interactive Cinema, Split Attention, Constructivist Narrative Film Theory, Cognitive Load theory

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The Digital Imaging revolution generates far-reaching changes in the structure of moving audio-visual texts, as we know them today in film and television. Theoretical writings have offered a variety of hypotheses concerning the intersections of this revolution with larger cultural shifts (e.g., post-modernism) and their implications for issues of origin, creativity, coherence, identification, affectivity and attention. The general thrust in this intensive writing concerns notions of segmentation, depthlessness, lesser affectivity, disorientation, split identity, *cyborgization*, *simulacrizaton*, etc. (e.g., [2], [14], [15], [24], [26]).

On the intersection of creation and technology there is intense experimentation with and research of the digital revolution's emergent new media. One particular trajectory of research and tool development, encapsulating the thrust and promise of these new media, deals with the vague notion of *Interactive Cinema*. That is, the interaction between *interactors* and moving audio-visual texts (e.g., Joseph Bates' *Oz project* [1], Glorianna Davenport's *Interactive Cinema* [10], Kevin Brooks' *Metalinear Cinematic Narrative* [6]. See a good critical survey of work done in the field in [19]).

Most creative work and research in this field, albeit from differing perspectives, tries to apply cinematic strategies and aesthetics to the creation of such interactive environments (e.g., [6], [10], [17], [21],

[23]). This, in the hope of not only evoking but also of enhancing the cognitive, affective and sensual engagement offered by the cinema. This enhancement is perceived as promising, given the apparent higher potential of interactivity to engage the user's attention, figuratively termed *immersion*, towards the work.

However, this intense research and tool development has resulted in little output and meager success insofar as deep attentive sustained interaction is concerned. The promise of such developments to exchange or surpass present mass popular cultural media such as film and television fails to materialize. This failure has led to a growing body of research aimed at debating the reasons for the present situation, offering probable solutions. Manovich for example, relates it to digital film's future not being that of constructing interactive narratives but rather in its "return" to the early cinematic paradigm of discontinuous attractions [21]. Lunenfeld [19], analyzing the *Blair Witch Project* film's distribution strategies and responses, suggests that the current notion of cinematic interactivity as a text inherently designed to be interactive is ill defined. Films are "interactive" neutral since interactivity is something users perform upon a given film. Hence, any film can be altered (and some are) by fans who "Poach" [16] already produced films and create and circulate their altered versions. These solutions are derived from some technological and formal characteristics of computer based interaction. Manovich [21] for example mentions numerical representation, modularity, automation, variability and transcoding (chapter 1, 18-61). They are also often supported by widespread post-modern claims on contemporary shifts in human perception and social conduct (e.g., Jenkins [16]). Lunenfeld [19], for example, speaks of "digital media's aesthetic of unfinished..." and of the "rhizomatic and dynamic interlinked communicative community..." (49).

These solutions actually imply an irretrievable loss of narrative cinema's capability to engage and sustain its viewers' cognitive, affective and sensual (audio-visual) attention with no comparable engaging-wise alternative. In fact, what Manovich offers is the narrow-ranged and short-term engagement typical of attraction. Experience for example the game-like restless split attentiveness generated by artistic interactive CD-ROM's such as Chris Marker's *Immemory*. Interacting with this CD-ROM your attention splits between still images, bits of images in motion, written comments, and the game like arrows and hot spots that lure you to impatiently jump back and forth. Conversely, Manovich presumes a contemplative art paradigm, ill suited for physical interaction with *moving* audio-visual materials [3] since it demands *arrest* of the work for deep contemplation (as in paintings), whereas cinema is predicated on *flow*. Experience the boredom, incomprehension, distraction and frustration generated by most video-art works, who try unsuccessfully to arrest their flow through loops so that the spectator has time to contemplate their idiolectic "narcissism" [18]. Likewise, Lunenfeld's suggestion that interaction consists of lay people arranging something different out of previous artistically pre-conceived work and sending it to others (emblematic are the *Star Trek* fans) entails the social

simplified reduction of cultural production. It enhances the non-coherence, non-closure and de-centering characterizing post-modern conceptions and fails by definition to achieve narrative cinema's deep sustained and wide-ranged engagement, offering instead the social narrow-ranged engagement characterizing social games.

Whereas these solutions offer *alternative* paradigms to narrative cinematic reception others try to *expand* its potential. Hence, some interactive film developers and researchers try to strike a balance between interaction and narrative cinema. Thus, the *Oz project* at Carnegie Mellon University tried to apply Aristotelian narrative structures to branching narratives, device interactive believable fictional characters, and use cinematic audio-visual continuity editing strategies to evoke a user's "suspension of disbelief" and consequent interactive "immersion" [1]. Likewise, Murray and Brooks, mentioning the hypertext medium's infancy, claim that interactive engaging multi-narrative is the future form of storytelling. This, thanks to the calculating and storage power of computers and the post-modern shifts in perception that basically expand, rather than break away from the potential inherent faculties of narrative [23], [6]. Kinder also believes that the shift in passing from physical passive reception of narrative films to behavioral active interaction with them can generate deep engagement. This depends on a successful combination of engagement strategies employed by interactive computer games with those of narrative cinema, feasible because of shared characteristics [17].

All these attempts however are bound to fail so long as they predicate their research and development upon misguided assumptions concerning cognitive, affective and sensual human faculties. Understanding these faculties may help us understand why narrative cinema engages deep sustained attention whereas present interactive film experiments often lead to frustration, distraction or shallow narrow-band engagement of the user. Only once this is understood, it may be possible to advance hypotheses about what could make interactive cinema deeply engaging.

The crucial problem entailed in the transition from narrative cinema to current attempts at deep sustained engaging interactive cinema is the shift from the rewarding narrative and audio-visual coherence of the popular cinematic "end product" towards the currently de-centered, closure-less and incoherent "interactive process" oriented product. I think that what misleads these attempts are post-modern presumptions about human perception. Hence, whereas de-centering, non-closure and incoherence were used by "modernist" marginal avant-garde films as deconstructing and often obscure **challenges** to established perceptions (e.g., Godard's films), to be countered by attempts at re-assessment and re-construction, post-modernists view de-centering, non-closure and incoherence as the technologically and culturally determined actual state of reception.

My claim is that these post-modern assumptions run against deeply ingrained and necessary cognitive, affective and sensual cinematic (and extra-cinematic)

types of reception. Jameson's [15] apt use of the metaphor of "schizophrenia" (26) to describe this type of reception, points to the incompatibility and inherent gap between actual, ingrained types of reception, and the arbitrary type of reception posited by post-modern cultural theory.

Based upon dual coding theory [9], cognitive load theory [8], and constructivist narrative film viewing theory [4], [5], [7] I contend that de-centering, non-closure and incoherence posit a subject capable of being attentive while splitting his/her attention [22]. Actually, few, if any real humans are capable of effectively dealing with many of the cognitive tasks demanding split attention, due to the cognitive load these efforts have on our limited working memory (e.g., [27]). This cognitive overloading, rather than deeply engaging attention, generates frustration or distraction.

As dual-coding theory explains and narrative films show, the correlation of moving images and sounds can be more sustained-attention engaging than only sounds, still images or moving images. This is because when images and sounds are presented the viewer/listener builds verbal and visual representations and connects between them. This leads to a deeper and more sustained attention than when only sounds or images are presented, since with the latter she is less likely to build a corresponding visual or verbal mental representation and interconnect them [22]. Furthermore, when sounds and *moving* images are connected, sustained attention is enhanced since interconnections are enriched.

However, not every combination of moving images and sounds engages and sustains attention. As cognitive load theory explains, split-attention overloading, potentially abundant in complex audio-visual articulations such as sound films, leads to a cognitive load on working memory with which viewers/listeners find it difficult or impossible to cope. As cognitive constructivist narrative film theory explains, sound films deeply engage and sustain the attention of viewers/listeners if they allow them to construct coherent narratives and audio-visual formations out of the flow of shifting sounds and images. Therefore an overall continuous editing style, synchronized or otherwise cohering audio-visual formations lacking redundant overloading embellishment [13], and narrative re-centering and closure, have become popular mass film artifacts. This is because they rewardingly play with, rather than frustrate the viewer/listener Gestalt-cohering thrust, by offering a constantly re-established cohering audio-visual spatial, temporal and narrative formation. On the other hand, non-cohering, de-centered and closure-less narrative and audio-visual formations frustrate or distract the viewer/listener Gestalt-cohering thrust by demanding he simultaneously be equally attentive to a flow of several audio-visual occurrences unrelated in space or non-consecutive in time. A good instantiation of this frustration is Mike Figgis' film *Timecode* (2000), so admired by Manovich ([20], 209. In it, four simultaneously evolving occurrences are presented on a

screen split into four, making it impossible for the spectator's split attention to follow what's going on.

This cognitive load is further complicated when we shift from flowing passive media such as narrative films, to flowing behavioral activated media such as interactive computer based products like "interactive films". In general, the expectation of interactive film researchers and tool developers that active behavioral engagement through interaction will enhance the user's sustained attention and deepen his experience have so far been frustrated. Constructivist narrative film theory, as some presume (e.g., [17], 122) seems to support the view that interaction will enhance deep attention. This because it presumes an active viewer engaged in cognitive processes to produce a film's meaning. This does not necessarily mean that by making her *behaviorally* active her attention will be enhanced, or the meaning she will construct will deepen. Actually, combining passive and behaviorally active cognitive constructiveness demands multi-tasking that may generate split attention overload [11], [12], [25]. Although split attention problems in multi-tasking may be cancelled by automation of one task (as in driving), this is undesirable with "interactive cinema" since what's the point of learning to habitually behaviorally drive a vehicle that doesn't get your body anywhere? More problematic however is the split attention of the viewer/user between what he/she cognitively constructs from what's going on in front of him/her, and his/her constant awareness to what may potentially lie at stake in options made available by behaviorally changing the course of events. This is the case not only with incoherent interactive constructs as *Immemorial* (see above) but also with multi-narrative or other interactive cinematic constructs that generate more or less coherent transitions. Experience for example playing around with Davenport's *Automatist StoryTeller Systems*, Bob Bejan's multi-narrative interactive film *I'm your Man*, Graham Weinbren's interactively perspective shifting *Sonata* (1990) or, for that matter, zapping on TV between simultaneous screenings of *Seinfeld* in different channels. In all of these experiences the behavioral option is restlessly often activated, resulting in the user/viewer being neither here nor there.

As can be seen, new media works based upon moving audio-visual material suffer from split attention problems resulting in distraction rather than sustained engagement. This may partly account for the meager results achieved so far. This does not mean that the promise of "interactive cinema" cannot be fulfilled. It means that for it to sustain deep wide ranged engagement, audio-visual and interactive multi-tasking split attention problems have to be avoided or managed.

Careful analysis of the compelling work of some new media artists (e.g., Shirin Nashat's split framed short movies) and of some video games (e.g., Sims, Everquest, Mist) in light of cognitive load theory, particularly that carried out in the realm of education, have much to offer in this respect. This however, remains beyond the confines of this paper.

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