Engagement with Document Measurements and Comparisons to Calculated & Perceived Rates of Information in Moving Image Documents

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Perceived rates of structural information in moving image documents can be calibrated to calculated rates of structural information for the same documents (Kearns & O'Connor, 2004). In summary, this study explored the use of the Claude Shannon's communication theory entropy equation in representations of video documents for children. The calculated rates of information in the videos were calibrated to the corresponding perceived rates of information as elicited from children who were shown video documents. Entropy measures were calculated for several video form attributes: set time, set incidence, verbal time, verbal incidence, set constraint, nonverbal dependence, and character appearance. As hypothesized, mechanically calculated entropy measurements (CEM) were found to be sufficiently similar to perceived entropy measurements (PEM) made by children so that they can be used as useful and predictive elements of representations of children's video documents. The relationships between the calculated and perceived measurements show that CEM could stand for PEM in order to enrich representations for moving image documents for this age group. We can say that there is a demonstrable correlation between the calculated and perceived entropies; therefore, we can accept the hypothesis that mechanically CEM will be sufficiently similar to PEM made by children so that they can be used as useful and predictive elements of representations of children's video documents.

As recorded in this study, both perceived and calculated measurements of the structural rate of information in communication of the video documents can be represented as a normal curve where entropy is a measure of structure that rises from 0 (zero) to near complete chaos as it approaches 1 (one). However, another way of expressing the notion of entropy is to say that it is inversely proportional to the likelihood of occurrence. With letters and words, we have some sense of the likelihood of occurrence (we know "e" will appear much more frequently than "w" and that "the" will appear more frequently than "kayak" in general use, though in a book on boating, "kayak" would be expected.) At zero, the structure of any message would exhibit no surprise; while at or near one, surprises would be so frequent as to become ordinary. One might say at the middle of the curve, there is sufficient familiarity within communication of a document for a change of structure to be surprising. But can one posit that familiarity with document structure and receptiveness to recognition of changes in the information stream is the same or even similar to viewer engagement and level of engagement with this same document? We have recently been presented the means to analyze video footage documenting the video viewers of the original study to determine a connection between perceived and calculated rates of information or document structure and audience engagement with the document.

Analysis of video documents captured of users watching these moving image documents (videos) suggest measurable means for representing levels of engagement with moving image documents based on interpretations to fine granularities of the physical data

stream detected in the video footage. Further, alignment between the content timeline of the viewed video document and the timeline of the observational video captured suggests that viewer behaviors as response to video content represent one measurement of *engagement with document*. Additionally, measurement of engagement with document shows similar trends consistent with perception of structural rate of information and calculated structural rate of information of the previous study. This measurable relationship between structural rate of information and viewer engagement with document suggests that where entropy is high in the physical structure of the communicated message likewise viewer engagement with the document is high.

References

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