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Analysis of:

Williams, Thomas R. et al. "Does Isolating a Visual Element Call Attention to It?: Results of an Eye-tracking Investigation of the Effects of Isolation on Emphasis." *Technical Communication* 52.1 (2005): 21-26. Print.

In their study, Williams et al. examine whether the technique of isolating a visual element from other visual elements is sufficient to establish its "dominance in a visual display" (25). The topic of this study falls within the domain of layout in visual design. Within this domain, the authors presume that "the more important elements [in a visual display] will be more noticeable: they will be attended to *more rapidly*, *more often*, or for *longer periods of time* than will the less important elements" (21, my emphasis). From the outset, the authors are establishing the metrics that will be used to measure the results of their study; since the requirements of this analysis do not include an evaluation of the methods, I will focus on the use of these metrics only in terms of their usefulness toward establishing research questions. With the metrics clearly stated, the authors then present the framework or basis on which the study is founded (concerning attention), the specific issue that the study aims to address, the justification for the measurement tool and how those measurements are valid toward addressing the issue, and the research questions that will be answered by the study.

In order to clearly define the issue of the study, Williams et al. address the issue of visual attention and what factors make objects appear visually interesting. Firstly, based on the work of "Russian psychologist Yarbus," the authors state that certain objects are inherently interesting (e.g. "a human face, which attract[s] a disproportionately large number of visual fixations […]") (21). The authors also contend (based again on Yarbus' research) that "a viewer's attention can

also be influenced by his or her intentions or goals," and that if a person is asked specific questions about an image, that person will be "much more purposeful in [his/her] scanning behaviors" (25). Finally, the authors state that certain visual factors garner attention "independent of the meaning they carry," factors such as "color, position, size [etc.]," but most important to their study, the factor of "isolation" (21). The authors take the eight total visual factors from a piece by Goldsmith and contend that isolation is the factor that has the least empirical evidence supporting its effectiveness in garnering attention irrespective of meaning. They further offer a statement from Lauer that they claim is "representative": "'When one item is isolated or sits apart from the other elements or group of elements, it becomes a focal point. Just by its separation, an element takes on visual importance … it is the contrast of placement [rather than] form'" (22). This is the issue with which the study concerns itself. Since there is no empirical data supporting this claim (presumably, since no other studies are introduced to suggest otherwise), the authors' study will test an untested claim that is "representative" of current opinions in the field of technical communication.

While the issue is clearly defined within the existing research, I find it puzzling that the authors do not include a quantitative definition of "isolation." To what degree must a visual element be separated from a grouping of other visual elements before it is considered "isolated"? This omission does not seem to be a serious problem with the study, however, since the point of the study is to test the concept of whether isolation is effective in garnering attention. Also, since the authors have indicated that there is little empirical evidence regarding the effectiveness of isolation, it is reasonable to conclude that this type of quantifiable definition does not yet exist. In implicit support of their definition of isolation, they provide sample slides which

visually demonstrate their conception of an isolated visual element; this image serves as a *de facto* quantification of "isolation" for the purposes of the experiment.

After outlining the issue to be addressed in the study, the authors seek to define the term "attention." Williams et al. describe the "'eye-mind hypothesis'" of Goldberg and Wichansky as the "assumption that what a person is looking at is what he or she is attending to" (22). To counteract arguments against this assumption, the authors acknowledge the fact that daydreamers can gaze at nothing in particular while thinking of a particular subject, but that "in the purposeful processing of visual information—especially complex visual information—what people are thinking about and what they are looking at are highly correlated" (again, a fact that is supported by a scientific study that they cite) (22). They continue by explaining the field of human vision and how the brain captures information in "snapshots" called "fixations" (22). They clearly define what a fixation is and how it fits into the visual process they will observe: "fixations" are periods lasting "between 200 and 350 milliseconds" and are interrupted by periods of eye movement called "saccades" where "information captured by the previous fixation is then effectively erased by information provided by the new fixation […]" (23). The underlying concept behind measuring eye movements and fixations is that "elements in a scene that are thought to be more important or more informative are typically fixated longer and more often than elements that are thought not to be as important" (22-3). Making this connection validates the use of their research tool, namely the ERICA™ eye tracking system, since measurements made with this system are relevant to the type of metrics that will test the issue of the study.

This definition of eye tracking and visual processing seems logical and indispensible, since validating the tool (eye tracking machine) and concept behind the use of the tool (fixation) will lend validation to the measurements collected. The process of linking the results to the

relevant issue (i.e. the results of the eye tracking study to the concept of whether isolation is effective at gaining "dominance") seems to rest on the assumption that the viewer will have a greater quantity of fixation (in terms of the metrics described in the introduction) on elements that the viewer ascribes more importance to. Since this is the hinge pin of their study, the fact that two studies (Christianson, Loftus, and Hoffman 1991 and Loftus and Mackworth 1978) are cited in support of this principle is crucial, since the introduction of a contrary theory would endanger a linkage of results and issue; however, for such a critical concept, there is very little space in the article devoted to cementing its validity. A further discussion of the two studies used would potentially lend additional credibility to the authors' argument by elaborating on the specific linkages made and how they relate to this particular study, as would a section refuting other extant theories of attention and eye fixation (if any such theories exist). If no theories exist to the contrary, the authors could be more explicit; this would specifically address whether an alternative explanation is available to interpret the linkage between the results and the issue examined.

Finally, the authors introduce their research questions. Each slide has an isolated visual element present, and the slides are divided into "look zones." Several measures are taken in their methods to isolate fixation as a variable from the other visual factors (inherent interest, viewer goals, color, size, etc.), but space prevents a discussion of those here. The measurement of importance is the fixation of the subject on the look zone containing the isolated element, specifically "the number of fixations," "the amount of time spent fixated," and "the amount of time until a fixation occurred [from the time the slide is first presented to the observer]" (24).

These questions seem well suited to addressing the question of whether isolation is an effective factor in two ways. First, the metrics they put forward in the introduction are the same

as those addressed in the research questions: frequency, duration of time, and rapidity of fixation. Secondly, the scientific studies presented to link the measurements to the relevant issue also correlate duration and frequency of fixation to the relative importance placed on the object by the observer. Since their research questions are strongly linked to the concepts that will support or contradict their issue they are investigating, the scope of their study is justifiable and their rationale is strong.

Although the authors do not explicitly state their hypothesis, the implication is that the results of their experiment will either confirm or refute Lauer's "representative" claim about the effectiveness of isolation as a visual factor. Given the strength of the support for the underlying claims of the study, the clear definition of the issue to be addressed, the validation of the tools and measurements to be used in the study, and the validity of the research questions in addressing the issue of the study, I conclude that Williams et al. constructed a strong rationale that supports a well conceived experiment. The only problems of note are the lack of a quantitative definition of isolation as a visual factor and the limited discussion of the studies linking their results to the issue the study addresses. Apart from these issues, the rationale of the study is well conceived and thoroughly supported by existing work in the field.