

Hello Everyone -

Thanks again for taking the time to meet this afternoon regarding our NASA "Clutter" research. As a follow-up to the meeting, below are the notes and the action items I recorded. Please advise if I've missed anything.

(1) Alexander and Stelzer observed that one pilot had high SVS experience relative to all others. This may have contributed to some of the effects of HUD features on overall clutter ratings.

Kim and Kaber – Analyze SVS experience as a covariate in the ANOVA model of overall clutter based on HUD features (7/23).

(2) In the logistic regression analysis, Kaufmann and Cowley found that only one subject appeared to be consistent in use of the primary/confirmatory display designation relative to overall clutter ratings. For an analysis across all subjects, there was no significant consistent pattern of HUD designation (primary/confirmatory) relative to overall clutter ratings. Kaufmann said clutter might only be one piece of the puzzle determining the primary/confirmatory display designation. Furthermore, clutter may not even be enough of a piece to predict primary/confirmatory. Cowley said that another issue might be that definitions of clutter varied significantly across subjects. Regarding the analysis of the use of descriptor terms for characterizing the clutter of HUD images, Kaufmann and Cowley found that if pilots used the terms safe/unsafe as descriptors of a display, they were less likely to say they would use display as a primary reference.

Kaufmann and Cowley – State at the beginning of the presentation of the analysis that there may be other "third variables" mediating the relation of clutter and designation of primary displays, etc. (7/23)

(3) Alexander and Stelzer conducted a factor analysis on the rating data for the pairs of descriptor terms and overall clutter rating. They found four underlying factors accounting for 78% of variance. The first factor accounts for about 32% of the variance (density factor). The second factor accounts for about 27% of the variance (feature similarity factor). The third variable accounts for about 11% of the variance (indiscernible, dull, monochrome, safe) and may relate to display clarity (imagery bleeding together and making the display unclear). The fourth variable accounts for about 7.6% of the variance in clutter and relates to movement or dynamics (dynamic/static, monotonous/redundant).

Alexander and Stelzer - To make comparison of FA using varimax rotation and PC analysis using promax. Select most appropriate analysis for presentation. Assess potential multi-variate normal assumption violation in use of FA.

(4) Kim and Kaber related the summary of pilots comments on the display images to the results of the preliminary MDPREF analysis. Those displays that

were strongly characterized in terms of clutter drew critical comments regarding the FLIR and the SVS at low approach altitudes.

Kim and Kaber – Highlight those displays that were considered to be strongly characterized in terms of overall clutter ratings and present them with pilot comments in the technical report (8/15).

These are all the items that I noted or recalled from the meeting. If you recall other points, please add to the list and distribute to the group. I would like to plan for our next project meeting on or around 7/23. I will be in contact in the interim regarding a detailed outline for our technical report (TR) writing. I will schedule with everyone as we approach that date. Please advise if you have travel.

Dave Kaber