

DETECTING MEAN DIFFERENCES AMONG BUSINESS MAJORS REGARDING THEIR PERCEPTIONS OF EFFECTIVE VISUAL AID USAGE

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ABSTRACT

A Visual Aid Usage Presentation Survey (VAUPS) was administered to 222 undergraduate students at a mid-sized rural university. Factor analysis was used to reduce survey items into seven derived factors. ANOVA tests were used to detect significant differences among the means of students' major, gender, income and age on the seven factors regarding perceptions of effective visual aid usage. In addition, step-wise regression analysis revealed gender and declared major to be significantly predictive of visual perception. These results suggest that business professors use visuals rich in color and technical flare appropriate with students' differing perceptions of effective visual aid usage.

Key words: Effective visual aid usage; color; graphic presentations; factor analysis

INTRODUCTION

Many researchers ask questions they find answers to by testing null hypotheses, and invariably rejecting or not rejecting said null hypotheses. Business educators teaching business majors might want to know what students perceive to be effective visual aid usage. Presumably, business professors using visual aids in their classrooms, as an attempt to make their messages more clear and salient to learners, will benefit from knowing what students perceive to be effective visual aid usage.

For research purposes, it is assumed students' perceptions of effective visual aid usage is related to their experiences of seeing professors' use visual aids during instruction: for example, the logic here is similar to a researcher who assumes GPA would be corollary with intelligence, if the purpose is to use GPA as a covariate in a means comparison (ANCOVA) test of male and female students on some known learning construct. In this study, a look at the related literature is used to determine a brief overview, of sorts, on research relating to students' perceptions of effective visual aid usage. Knowing of what has been written in the past is important to the design of this study; therefore, a limited number of studies, across a broad range of grade levels, are presented. The literature is presented chronologically.

LITERATURE RELATED TO TOPIC

Allen (1963) recommends teachers integrate technology into the classroom; as other instructional tools, the key value of television is its effective use in conjunction with classroom instruction. Beck (1965) provides guidance on studies of the effectiveness of instructional television that showed it to be at least as productive as standard methods. Suggestions on its integration into the classroom as a presentation tool were also made. Wilson (1967) provokes an early discussion on the aspect of visual aid to determine a clear understanding of visual perception that is important to teachers. For a teacher working with specific problems, visual perception can aid a child to become a better reader and a better learner. Allen and Daehling (1968) use still slide programs with audiotapes in three forms: figural, symbolic, and semantic. A total of 247 sixth-grade students were randomly assigned to one of the nine treatment groups, and measures of mental, verbal and cognitive abilities related to the three intellect factors were obtained for all participants. Performance is assessed by a written post-test. They find no conclusive interaction between modes of presentation, inherent content of materials, and learner characteristics.

Wheelbarger (1970) tests theories in audiovisual education that held that learning from a visual illustration was directly related to the realism of the visual aid. Five treatment groups and all groups were pre-tested, taught the same unit of instruction, and post-tested. Four groups saw slide sequences with illustrations with a different degree of realism: line drawing (black and white), line drawing (color), shaded drawing (black and white), and shaded drawing (color). The fifth group saw a slide presentation with words only. The results of the study show no significant difference among the five groups' learning achievement.

Harland and Whyte (1981) investigate the proposition that males have a predominant tendency to encode visually when reading, whereas females tend to encode phonologically. Their findings indicated that males appeared to benefit more from word training, whereas females benefited more from letter training in the transfer task. The findings suggest that when teaching reading to young children, a more visually oriented method might be more effective for boys and a less visual method might be more effective for girls. Bennett (1988) provides examples of visual representations that are helpful in understanding number relationships and the algebraic statements of those relationships. Suggestions are made teachers should use representations to aid students in discovering number relationships.

Roth (1992) surmises visualization to be a factor of intelligence that includes the mental manipulation of spatial configurations and has been associated with spatial abilities, creative thinking, and conceptual problem solving. A shift from print to electronic media would increase the need to educate the next generation for the use of visual images is asserted. Pruisner (1993) conducts a study to determine the impact of color on learning. An entire seventh-grade class from a Midwestern junior high school was used in one of four treatment groups: (1) color-cued presentation, color-cued assessment; (2) color-cued presentation, black/white assessment; (3) black/white presentation, color-cued assessment; (4) black/white presentation, black/white assessment. It was determined that the preferred presentation type was color-cued; an important factor in enhancing performance appeared to be the presence of a systematic color cue in graphic presentation.

Scheiber and Hager (1994) present strong evidence that visual aid selection was beneficial to presentation effectiveness and its persuasive meanings. They find more than two thirds of the managers they surveyed reported that they "very frequently" or "frequently" gave

presentations. Morrison and Vogel (1998) assert although business presentations rely on a variety of factors beyond the substance and structure of the presentation (audience factors, environmental factors, and perceptions of the speaker) the visual variable affected all factors. They find a 79 percent over 58 percent audience consensus when comparing visual to non-visual usage. They also find too many colors and an overuse of animation could backfire on the presenter.

Bell and Quazi (2005) report findings of business majors' perceptions on effective visual aid usage from a randomly selected group of 226 students representing a population of approximately 1,000 at one regional institution of higher learning. Bell and Quazi (2005) report the operational definition for their study:

Visual aid usage is any tool that can be a 'thing seen' by an audience and manipulated by a presenter in making the presentation more effective. Any gesticulation, eye contact, facial expression, mechanical device, color usage in slides, electronic equipment including PowerPoint, and non-technical devices (flip chart, chalkboard, transparency, etc.) are all examples of Visual Aid Usage if used during a presentation to enhance its effectiveness.

In their study, they link visual learning (Dunn and Dunn, 1993) with what Sandford and Yeager (1942) calls doors to the mind. Sandford and Yeager (1942) provide a list of seven doors to the mind: visual, auditory, motor, tactile, thermal, gustatory, and olfactory. Bell and Quazi (2005) focused their study on only one door: visual. They conclude there is further need to conduct a study on a different student population that would shed new light on students' perceptions of effective visual aid usage. The literature search and review reveals a handful of articles with relevance to the scope of this study, and its purpose (Bell and Quazi, 2005; Scheiber and Hager, 1994; Morrison and Vogel, 1998; etc.).

These papers contribute to knowledge of visual aid usage. Not only does the literature review provide important understanding of visual aid usage and its viability for instructional purposes across many grade levels, but also it helps delimit the scope of this study. Since many business educators accept the theory students learn by differing visual, auditory, and kinesthetic styles (Dunn and Dunn, 1993), the research questions become very apparent. All research at a point must be made specific to one or more scientific questions.

PROCEDURE

The twenty-five item Visual Aid Usage Presentation Survey (VAUPS), developed by Bell and Quazi (2005), and a separate list of questions that pertain to assessment of demographics were administered to students and used with permission. Two business professors at a regional state university asked students in six undergraduate business courses to complete the VAUPS during the fall 2005 semester. The six courses were Introduction to Computer Information Systems (CIS 101), Elements of Statistics (CIS 200) Information Systems Design and Analysis (602), Financial Accounting (ACCT 203) Managerial Accounting (ACCT 204), and Auditing (ACCT 607). These courses are core requirements for the students with business majors at the college where the survey was administered, therefore, course enrollments are assumed to be normally distributed.

The students enrolled in those six courses were presumed to have differing amounts of exposure to visual aid usage. The professors teaching those courses used a variety of visual aids, including PowerPoint, chalkboard, Whiteboard, liquid crystal display (LCD), handouts, transparencies and videos. The survey was strictly voluntary and students read a disclosure form prior to completing the VAUPS. University guidelines on ethical conduct were followed and permission to collect data was granted. Two hundred twenty-two business and non-business majors completed the survey. As shown in the *Appendix*, the students responded to a five-item Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Three (3) was used as the Neutral term.

DESCRIPTIVE DATA

There were 222 completed surveys and all were usable. The statistical analyses presented in this study were based on those 222 observations. Information concerning usable questionnaire returns is presented in Table 1. Statements are indicated by S1, S2, S3, etc., where, for example, S2 refers to statement 2 - “A business presentation is more effective when color slides are used rather than black and white slides.” The full list of statements is presented in the *Appendix*.

Table 1
Usable Questionnaire Returns

Group Type	Group Size	Usable Returns	Usable Percent
Students	222	222	100

Analyses of the demographic data revealed that 113 males and 109 females completed the survey. Two hundred twelve students were 17+ years old, seven were 27+ years old, and three were older than 37. Income was reported to be less than \$10,000 by 179 students, between \$10,000-\$30,000 by 38 students, between \$31,000-\$50,000 by 5 students, and \$51,000 or more by zero students. Declared majors of the respondents were: Accounting – 17, Business Communication – 59, Finance– 19, Information Systems Design and Analysis – 21, Leadership – 7, Management – 8, Marketing – 30, MIS – 28, and Other – 20, Double Major – 13. There were 55 freshmen (which comprised 24.775% of the respondents), 55 sophomores (24.775%), 56 juniors (25.225%), and 56 seniors (25.225%). The VAUPS instrument reliability was verified before data were analyzed.

VERIFYING RELIABILITY OF THE VAUPS

Bell and Quazi (2005) reported a reliability of .78 on the VAUPS. To verify the scale as being reliable, a Cronbach’s Alpha (1984) was run on the VAUPS instrument. The overall scale reliability for this study is 0.81, which exceeds the Nunnaly (1978) criteria of 0.70 for an acceptable alpha, presented in Table 2. Devellis (1991) reports his personal comfort range as “below .60, unacceptable; between .60 and .65, undesirable; between .65 and .70, minimally acceptable; between .70 and .80, respectable; between .80 and .90, very good...” (1991: 85). The VAUPS turns out to be a “very good” measure of students’ perceptions of effective visual aid usage, with a verified alpha. The reliability did not improve if any item was deleted; therefore, the entire VAUPS was left intact for data analyses. A factor analysis was conducted after verifying the instrument’s reliability.

Table 2
Cronbach's Alpha Reliability Coefficient for VAUPS*

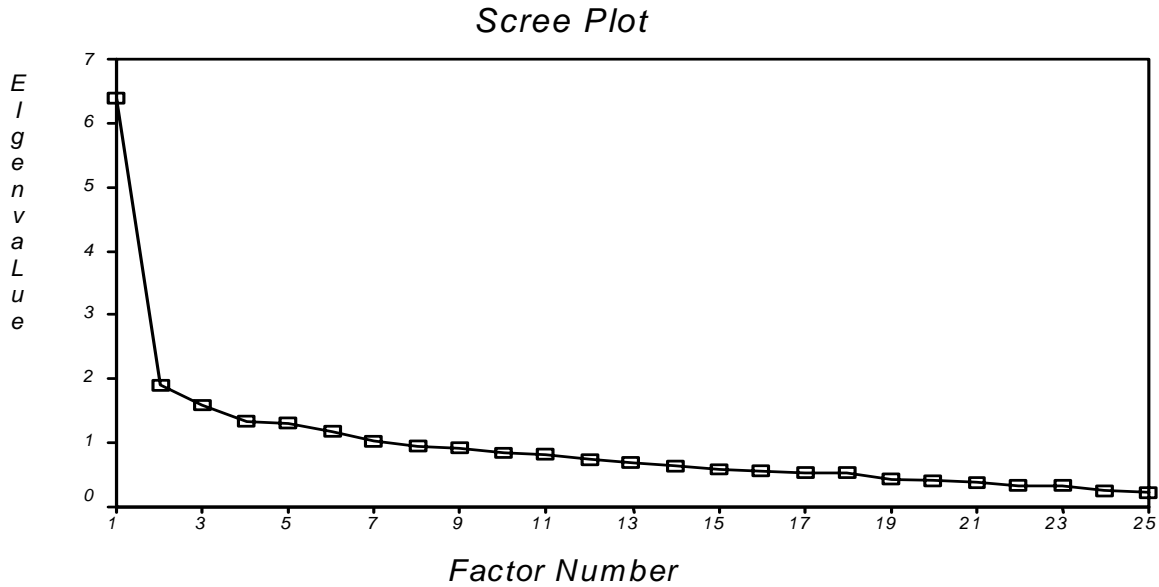
Statement	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
S1	85.2613	90.3387	.5348	.7950
S2	85.0315	88.8180	.6138	.7911
S3	84.9459	89.2459	.6460	.7908
S4	86.9640	105.1390	-.3200	.8287
S5	86.3198	98.8430	.0338	.8170
S6	85.7613	96.0197	.1605	.8124
S7	85.4234	90.4805	.5087	.7959
S8	85.6622	92.8130	.3788	.8018
S9	86.4640	100.2589	-.0385	.8191
S10	85.2207	90.1185	.4104	.8001
S11	86.3108	100.1428	-.0415	.8219
S12	85.6937	91.8877	.3265	.8047
S13	86.3604	97.5438	.1077	.8136
S14	85.8423	94.6492	.2498	.8078
S15	85.7342	93.4449	.3682	.8024
S16	85.4685	87.6619	.6080	.7901
S17	85.3333	88.6667	.5706	.7923
S18	85.4640	90.2770	.5124	.7956
S19	85.7342	95.2820	.2421	.8078
S20	85.6036	92.2946	.3997	.8009
S21	85.2568	92.0559	.4979	.7976
S22	85.4009	89.1734	.5683	.7928
S23	85.7523	94.0515	.3235	.8043
S24	85.1892	90.3713	.5975	.7933
S25	85.5315	90.9108	.4596	.7979
Test Scale				.8098

*N of Cases = 222.0; N of Items = 25

FACTOR ANALYSIS

Two-hundred twenty-two students' responses to the VAUPS were then subjected to an un-rotated principal component analysis, with a Scree test (in SPSS 14.0). Seven factors were suggested by the Scree test. Those factors explain 43.212% of variance. The Scree is presented in Exhibit 1 below. Principle Axis Factoring was used with Promax (Oblique) Rotation to extract the seven factors, shown in Table 3a. The seven factors, Eigenvalue of 1 criterion, were produced with 17 iterations. The criterion for selecting a variable's factor loadings was set at 0.50 (Devellis, 1991 & Kachigan, 1991).

Exhibit 1
Scree Test and Eigenvalue and Factor Number



Using these criteria, four items (S2, S3, S1, S7 in the VAUPS) were found to load on the first factor (accounting for 23.637% of the scale variance) which was subsequently labeled **Advanced Use of Color Enhanced Technical Visual Devices**; three items (S25, S20, S23) loaded on factor two (accounting for 5.289% of the scale variance) which was labeled **Importance of Bells and Whistles in Persuasive Presentations**; two items (S14, S15) loaded on factor three which was labeled **Limit Color Usage & Caution on Slide Creation**; three items (S16, S17, S11) were found to load on factor four which was labeled **Business Presentation Appropriateness and Wardrobe**; two items (S19, S20) loaded on factor five and was labeled **Readability and Punctuated Text Enhanced Presentations**; one item (S5) loaded on factor six and was labeled **Color Enhances Power of Transparencies** ; and one item loaded on factor seven and was labeled **Importance of Bodily Delivery**, (see Tables 3a and 3b for loadings and derived factors).

Among the seven factors, variable loading S5 (with a factor loading of .696) and variable loading S9 (with a factor loading of .539) survived the cutoff selection criteria of .50. Therefore, factors six and seven are represented by only one variable loading each. This was an indication that not enough statements were presented representing those underlying dimensions of the construct; however, given the “very good” scale reliability (Cronbach’s Alpha of 0.8089) and a large random sample of 222 observations, statements 5 and 9 were preserved for hypothesis testing. To ascertain if there were any significant differences in students’ perceptions among the demographic variables (grade level, declared major, income, age and gender), data were further analyzed using statistical methods to test the null hypotheses.

Table 3a
Promax Oblique Rotations with Seven Derived Factors & Communalities

Rotated Variable	Factor Loadings							Communalities
	1	2	3	4	5	6	7	
S2	.948	.057	-.029	-.096	-.124	.044	.029	.453
S3	.779	-.002	.136	-.073	-.015	.193	-.001	.750
S1	.671	-.110	.015	.006	.143	-.044	.049	.662
S7	.624	-.121	-.048	.020	.191	.130	.044	.310
S8	.495	.117	-.039	-.026	.038	-.329	.146	.458
S12	.477	-.308	-.034	.180	.094	-.108	-.085	.130
S4	-.422	-.156	-.008	.044	.266	.213	.138	.387
S25	.029	.828	.031	-.242	-.078	.053	-.024	.429
S20	-.050	.808	-.116	-.220	.155	.034	.057	.265
S23	-.172	.562	.073	.018	-.057	.023	-.044	.270
S18	.266	.347	-.081	.168	.075	-.167	.185	.248
S22	.151	.319	-.027	.233	.136	.097	.020	.285
S10	.164	.232	-.091	.057	.126	-.038	-.147	.177
S14	-.124	-.037	.785	-.003	.103	-.221	.152	.531
S15	.217	.034	.626	.028	-.220	.122	.109	.500
S16	-.074	.401	.149	.632	-.095	.001	.051	.731
S17	.201	.082	-.054	.568	.026	.125	-.064	.582
S11	-.028	-.342	-.024	.548	-.085	.006	.101	.431
S19	.035	.039	-.100	-.026	.621	.025	.283	.296
S21	.228	.013	.179	-.185	.553	-.023	-.040	.558
S5	.025	.086	-.144	.066	.006	.696	.097	.536
S6	-.050	.034	.131	-.045	.092	.184	-.159	.429
S9	-.174	.111	.161	-.034	.255	.097	.539	.239
S13	.162	-.126	.098	.183	.102	-.015	.433	.584
S24	.248	.226	.064	.000	.144	-.084	-.336	.563

HYPOTHESIS TESTING

One-Way Analysis of Variance (ANOVA) tests, and a Stepwise Regression procedure was used in SPSS 14.0 to ascertain if significant mean differences existed among seven derived factors as dependent variables and six independent variables (1) declared major, (2) age (3) grade level, (4) gender, (5) gender/major as predictors, and (6) income regarding students' perceptions of effective visual aid usage. The hypotheses were stated the following way:

Hypothesis₁: There is no significant difference among the means of students' declared majors and their perceptions of effective visual aid usage.

Hypothesis₂: There is no significant difference among the means of students' ages and their perceptions of effective visual aid usage.

Table 3b
New Factors and Item Descriptions

Factor One: Advanced Use of Color Enhanced Technical Visual Devices
S2: A business presentation is more effective when color slides are used rather than black & white slides.
S3: Visual aids such as Overhead Transparency, PowerPoint, Whiteboard, Flip Charts, or Handouts make the presentation more effective.
S1: A one-hour business presentation is more effective if colorized examples of technical Information (in the form of Bar Charts, Pie Charts and Histograms) is used.
S7: Accounting and finance presentations are more effective when using graphs and charts.
Factor Two: Importance of Bells and Whistles in Persuasive Presentations
S25: Presentation visuals that are entertaining are very important regarding effectiveness.
S20: Animation can make the presentation more effective.
S23: Presentation visuals that persuade a change in my beliefs or actions are effective.
Factor Three: Limit Color Usage & Caution on Slide Creation
S14: Four or five colors should be the maximum number used in a slide.
S15: Background colors should be determined before any other color is selected when Creating slides.
Factor Four: Business Presentation Appropriateness and Wardrobe
S16: The presenter's clothes can make the presentation more effective.
S17: Business apparel should always be used during a business presentation.
S11: Cartoon characters should not be used in a business presentation.
Factor Five: Readability and Punctuated Text Enhanced Presentations
S19: Letter size matters more than color in a slide show.
S21: Bullets or numbers help delineate a business presentation better than text alone.
Factor Six: Color Enhances Power of Transparencies
S5: Colorized Transparencies are as effective as Power Point slides.
Factor Seven: Importance of Bodily Delivery
S9: Hand gestures are more important than mechanical visual aids.

Hypothesis₃: There is no significant difference among the means of students' college grade levels and their perceptions of effective visual aid usage.

Hypothesis₄: There is no significant difference between the means of male and female students and their perceptions of effective visual aid usage.

Hypothesis₅: Business majors' status as male or female is not predictive of their perceptions regarding effective visual aid usage (follow-up hypothesis).

Hypothesis₆: There is no significant difference among the means of students' income and their perception of effective visual aid usage.

Descriptive and inferential statistics, results of Analysis of Variance (ANOVA) tests, and a Stepwise Regression test on Hypothesis₅ are presented in the following few pages for six null hypotheses tested at a significance level of .05.

An ANOVA test revealed significant statistical differences among the means of students' declared majors and their perceptions of effective visual aid usage; **therefore, hypothesis one was rejected.** Students differed according to their major on factors one, five and seven with $p = .001$, $p = .041$ and $p = .001$ respectively. A Tukey's test (in SPSS 14.0) revealed Business Communication majors differed on factor one with Accounting, Finance, Management, Marketing, MIS, and Other majors and had $p = .015$, $p = .010$, $p = .003$, $p = .003$, $p = .027$, and $p = .045$ respectively; The Business Communication mean was $-.853$ and Accounting, Finance, Management, Marketing, MIS, and Other majors had means of $.012$, $.221$, $.239$, $.244$, $.142$, and $.209$ respectively. Accounting and Business Communication majors differed on factor five having a $p = .008$; Students differed significantly on factor seven with Accounting and Leadership majors having a $p = .019$. A Tukey's test (in SPSS 14.0) revealed Accounting and Business Communication majors differed on factor five with $p = .008$ with means of $-.559$ and $.243$ respectively. A Tukey's test (in SPSS 14.0) revealed Accounting differed significantly with Business Communication majors on factor seven with $p = .004$ and Accounting majors differed significantly with Leadership majors on factor seven with $p = .019$; Accounting, Business Communication and Leadership majors had means of $-.204$, $.557$ and $.766$ on factor seven respectively.

An ANOVA test revealed significant statistical differences among the means of students' ages and their perception of effective visual aid usage; **therefore, hypothesis two was rejected.** Students differed on factor two only according to their ages with $p = .037$. A Tukey's test revealed a $p = .030$ between students reporting to be 17+ and the seven students reporting to be 27+. The means for 17+ and 27+ students were $-.466$ and $.024$ respectively. Younger students appeared to have an opposite perception of factor two when compared to the seven 27+ older students.

An ANOVA test failed to reveal significant statistical difference among the means of students' college grade level and their perceptions of effective visual aid usage; **therefore, hypothesis three was not rejected.**

There is a significant statistical difference between the means of male and female students' and their perceptions of effective visual aid usage; **therefore, hypothesis four was rejected.** Male students did in fact differ from female students on factors one, two and five with $p = .028$, $p = .002$ and $p = .022$ respectively. Male and female student means differed on factor one with $-.138$ and $.143$ respectively. Male and female students differed on factor two with means of $-.189$ and $.196$ respectively; Male and female students differed on factor five with means of $-.124$ and $.063$ respectively. Male and female students appeared to have an opposite perception of dimensions of the visual aid construct represented by factors one, two and five.

As a follow-up to Hypothesis 4, a stepwise regression on male and female students and declared majors was run, due to the opposite direction of mean scores for male and female students revealed. The stepwise regression revealed gender and major were significantly predictive of students' perceptions on effective visual aid usage; **therefore, hypothesis five was rejected.** A stepwise regression on factor one and factor two (as criterion variable one at a time) was run since cumulatively the two factors account for 28.926 percent of the variance explained and gender and major were used as predictor variables on both tests. Gender, the Business Communication and Leadership majors were most predictive on factor one (cumulative: R

squared = .078, .139, .158; Beta = -.280, -.246, .139, and Significant t= .000, .000, and .009) respectively. Gender, the Business Communication, Leadership and Management majors were significantly predictive on factor two (cumulative: R square = .044, .070, .086 and .100; Beta = .218, -.144, -.124; and .118, and Significant t= .000, .010, .025 and .035) respectively.

An ANOVA test failed to reveal a significant statistical difference in students' income and their perceptions of effective visual aid usage; **therefore, hypothesis six was not rejected.**

DISCUSSION

Data were analyzed using SPSS 14.0. The demographic variables age, gender and major were statistically different on at least one of the seven derived factors; however, grade level and income were not significantly different on at least one of the derived factors. Seven factors accounted for 43.212 percent of the scale variance. Factor one (*Advanced Use of Color Enhanced Technical Visual Devices*) accounted for 23.637 percent of the variance explained and factor two (*Importance of Bells and Whistles in Persuasive Presentations*) accounted for 5.289 percent of the variance explained. Sprague and Stuart (2000) is a good starting place for those unfamiliar with the use of stylistic devices and visual presentation preparation. Gene Zelazny (1996) in his book *Say it with Charts* offers useful suggestions on a wide range of visual aids. His book can help professors avoid common pitfalls associated with incorrect usage of charts.

A stepwise regression was run (as a follow-up to significant male female differences found after testing hypothesis₄) on factors one and two as criterion variables (one at a time) since cumulatively they account for 28.926 percent of the variance explained. Gender and 10 levels of major (dummy coded) were used as predictor variables. Age, grade level and income were excluded from the regression model because those variables are assumed to co-vary naturally. Given the significant difference in the inverse direction of mean scores on factors one and two for males and females, it was reasonable then to determine how predictive gender and major was on students' perceptions of effective visual aid usage. Simply put, the data generated for the single campus student population was very rich. Some implications of the findings about the data now known can be presented.

IMPLICATIONS

Male and female students differed on factors one, two, and five (with mean scores on each factor being correlated opposite to said factor). Male students seem to perceive "advanced use of color enhanced technical visual devices" inversely with female students. Meaning too much of this factor would have the opposite effect on their perceptions; female students' perceptions are contrary to male students' perceptions. Female students would positively perceive a more advanced use of color enhanced slides or technical visual devices in a professor's presentation.

The importance of bells and whistles in persuasive presentations is supported by evidence in this study that male and female students differ in the perceptions of effective visual aid usage in that dimension of the visual aid usage construct. Males appeared to have an inverse perception of this dimension and female students had a direct correlation to the dimension. Gimmicks would impress male students far less than they would female students, if the purpose of the presentation is to influence a change in audience belief or action. It appears too many bells and whistles could

hurt the presentation with a persuasive purpose as perceived by male students on this particular college of business campus. There are a few recommendations and limitations.

RECOMMENDATIONS FOR PROFESSORS

Professors at the regional university where the study took place should create visual aids that reflect the differences found between male and female students, among majors, and age groups. These results suggest that business professors should use visuals rich in color and technical flare appropriate with students' differing perceptions of effective visual aid usage; however, when presenting information to a mixed gender audience of students, the professor should be mindful that a blend of color enhanced technical devices might impress female students more than males, and upperclassmen more than lower classmen. Animation is useful, but, visual aids designed to enhance the speaker's purpose might work better in a mixed crowd of business majors with different genders and ages.

Core courses will require a plethora of varying visual aid devices to meet the perceptual inconsistencies of undergraduate business majors regarding effective visual aid usage. Recall, Business Communication Majors had a mean of -.853, negatively correlated with factor one. Skepticism might be a natural propensity for students majoring in a field requiring such high degree of meticulousness and accuracy in the use of oral and written communications. More research in the area of visual aid usage is needed. Professors should be sure to use a variety of low-tech, colorized, and high-tech visuals emphasizing the presentation purpose when teaching to a mixed audience of male and female students with different business majors and ages. Professors of business communication teaching their own majors need fewer (if any) gimmicks, less flare of color in slides, and less dependence on technology: they need visuals that adhere only to the professor's speaking purpose.

Limitations and Delimitations

Since all courses sampled were core, it was assumed students enrolled in them were distributed normally. A multi-campus study should be conducted using similar statistical methods in order to hash out deeper understanding on the separate dimensions of perceptions on effective visual aid usage construct. The VAUPS used has only been administered twice, and it needs to be administered more times in order to strengthen its reliability as a tool for measuring the visual aid usage construct. The factor analysis technique used in this study was exploratory in nature. Means testing detected significant differences between male and female students at one regional institution's college of business; nonetheless, it is not known if these results would be the case for a sample of business majors randomly selected from a much larger population, across five or more college campuses. More work in this area, assuredly, needs to be done.

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APPENDIX

Visual Aid Usage Presentation Survey (VAUPS)

I am enrolled as a: Senior ____, Junior ____, Sophomore ____, or Freshman ____					
My Major is: Accounting __, Management __, Marketing __, Finance __, MIS __, or a Double Major in: _____ and _____ or other/non-business _____					
My gender is: Male _____ or Female _____ My age is: 17+ __, 27+ __, 37+ __					
My Income is: Less than \$10,000 ____ \$10,000-\$30,000 ____ \$31,000-\$50,000 ____ or \$51,000+ ____					
<i>This survey is designed to measure your perception of visual aids as they are related to an effective business presentation. Please circle the number that best reflects your level of agreement with the corresponding statement: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree</i>					
1. A one-hour business presentation is more effective if colorized examples of technical information, in the form of Bar Charts, Pie Charts and Histograms, is used.	1	2	3	4	5
2. A business presentation is more effective when color slides are used rather than black and white slides.	1	2	3	4	5
3. Visual aids such as Overhead Transparency, PowerPoint, Whiteboard, Flip Charts, or Handouts make the presentation more effective.	1	2	3	4	5
4. Black and white slides are just as effective as color slides for a one-hour business presentation.	1	2	3	4	5
5. Colorized Transparencies are as effective as Power Point slides.	1	2	3	4	5
6. A one-hour PowerPoint business presentation with fifty slides <u>does not</u> make the presentation more effective.	1	2	3	4	5
7. Accounting and finance presentations are more effective when using graphs and charts.	1	2	3	4	5
8. PowerPoint is more effective as a visual aid than Transparencies and Whiteboards combined.	1	2	3	4	5
9. Hand gestures are more important than mechanical visual aids.	1	2	3	4	5
10. A one-hour business presentation without any visual aids would be boring and ineffective.	1	2	3	4	5
11. Cartoon characters should not be used in a business presentation.	1	2	3	4	5
12. Red should never be used in the business presentation when expressing a healthy income statement.	1	2	3	4	5
13. The color of the room should not contrast with the colors of the slides.	1	2	3	4	5
14. Four or five colors should be the maximum number used in a slide.	1	2	3	4	5
15. Background colors should be determined before any other color is selected when creating slides.	1	2	3	4	5
16. The presenter's clothes can make the presentation more effective.	1	2	3	4	5
17. Business apparel should always be used during a business presentation.	1	2	3	4	5
18. Video presentations are more effective than using a chalk-board.	1	2	3	4	5
19. Letter size matters more than color in a slide show.	1	2	3	4	5
20. Animation can make the presentation more effective.	1	2	3	4	5
21. Bullets or numbers help delineate a business presentation better than text alone.	1	2	3	4	5
22. Eye contact is the most important visual aid for an effective speaker.	1	2	3	4	5
23. Presentation visuals that persuade a change in my beliefs or actions are effective.	1	2	3	4	5
24. Presentation visuals that enhance information make the presentation more effective.	1	2	3	4	5
25. Presentation visuals that are entertaining are very important regarding effectiveness.	1	2	3	4	5

Autobiographical Note

Reginald L. Bell is an assistant professor of business communication at Prairie View A&M University's college of business. His current research interests include oral and written communication instructions in business subjects. He has published in the *Journal of Diversity Management*, *International Journal of Education Research*, *Journal of College Teaching and Learning*, *Journal of Business and Leadership*, *the Journal for Current Research in Global Business* and the *Southwestern Business Administration Journal*. He has presented numerous business communication related topics at Association for Business Communication International Conferences. His paper presented at the International Academy of Business and Public Administration disciplines (IABPAD) conference, April 2006, won best paper award.

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