A STUDY OF THE EFFECT OF PAPER COLOR
ON TEST PERFORMANCE IN
BUSINESS COMMUNICATION

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Color has been shown to affect mood and productivity in a variety of different situations. This study evaluated the performance of students in readiness-assessment quizzes in business communication classes, comparing the grades of students whose test papers were white with grades of students who received pastel-colored test papers. The results revealed that there was no significant difference between the two groups. Other research suggests that color may, however, have an effect in other situations.

Color theory has been investigated in many ways, at least since 1894, with varying degrees of reliability. Most people accept that certain colors trigger different emotions and enhance the environment to elicit different kinds of responses. Many color studies have been carried out in schools, partly because of the availability of a large number of subjects, and partly to study ways to improve academic performance. The focus of this study was also to identify ways in which color could be used to improve student performance.

REVIEW OF LITERATURE

While Internet purveyors of business stationery will freely provide any potential buyer with definitive lists of what each color and combination symbolizes to the viewer, academia is still working on understanding what any of these findings mean for us. On a very basic level, we agree that color (among other things) is a legitimate part of a textbook-selection process, and we ourselves use color in organizing and presenting new information . . . but what’s the next step? Mehta and Zhu [5] have published studies that they claim clarify how red and blue differently affect performance on detail-oriented versus creative tasks with strong implications for test preparation and testing formats.

Whitfield and Wiltshire [13], in their critical review of the field, discounted the work done before 1950 because it didn’t consider even the three basic components of color (hue, value, and chrome). They also identified flaws in most subsequent research: inconsistencies in the terminology used by respondents to express preferences; lack of attention to surround color (as well as sample color); disregard of the effects of illumination; lack of discussion of size, shape, texture, and complexity of the objects used to present sample colors; and the lack of control for how the very nature of the sample objects might affect a subject’s response to the color of that object. With all these issues, it is not surprising that the field of color psychology has reported a mass of often conflicting results.

Despite this disappointing assertion that most color research is inconclusive, the following are findings from some of the research on the effects of color:

- Paper color (including white and the unpleasant goldenrod) does not affect scores on objective exams [6].
• Red signals (test number, etc.) result in lower scores than do white and green [1].
• Pink negatively affects performance (Pellegrini & Schauss, 1980) or not (Gilliam, 1991; Green, Hasson, Mohammed, Phillips, Richards, Smith, & White, 1982) [Reported in 1].
• Color coding seems to help field-dependent students organize material and be more successful [7].
• Students taking exams on blue and red paper performed more effectively on blue, especially for complex questions [9].
  o Jacobs and Blandino (1992)—red causes less fatigue than yellow, blue, green, white [Reported in 9]
  o Wilson (1966)—red is more arousing than green [Reported in 9]
  o Jacobs and Suess (1975)—red and yellow cause more anxiety than do blue or green [Reported in 9]
• Color can help individuals process and learn new information [8].
• Students have lower scores with primary-blue paper, but pastel colors have no effect; white paper produces best scores [12].
  o Michael and Jones (1955)—paper color has no effect on exam scores [Reported in 12].
  o Soldat, Sinclair, Mark (1997)—students achieve higher scores on blue than red paper [Reported in 12].
  o Skinner (2004)—students achieve higher scores with red, rather than blue paper; highest scores with white [Reported in 12]
• Color can help hyperactive children stay focused by making the environment more stimulating [14].
• Pastel examinations do not affect performance [2].
  o Fielding (2006)—outdated notion that red promotes aggression and green is calming [Reported in 2]
  o Neumesiter (2005)—bright wall paint reduces dropout rates and improve attendance in schools [Reported in 2]
  o Hoadley (1990)—colored tables and graphs promote organization and success in students [Reported in 2]
  o Dudek (2006)—white résumés were received more favorably than yellow résumés [Reported in 2]
  o Vining (2006) and Shoots (1996)—most color effects are based on learned responses (e.g., red stop lights) [Reported in 2]
  o Jacobs & Blandino (1992)—color only affects the subject’s perception of his/her fatigue [Reported in 2]
  o Shieh, Chen, & Chuang, (1997)—color of display terminal has no effect [Reported in 2]
• Color affects functioning, fatigue, and vision in 5- and 6-year-olds [4].
• Red and blue differently affect performance on detail-oriented versus creative tasks with strong implications for test preparation and testing formats [5].
• Colors, smiles, and frowns can affect processing—happy cues produce nonsystematic, while sad cues produce systematic processing [11].
• Prairie dogs identify colors and give different warning signals [10].
Although fascinating, these studies are not conclusive and are even contradictory; however, it seems logical to believe that color can affect student test performance.

PURPOSE

The purpose of this study, therefore, was to attempt to determine whether there was a difference in scores between students whose question sheets were white and those whose question sheets were pastel colors. The focus was on differences for short readiness quizzes of 12 to 20 questions.

METHOD

Students in a business-communication class were given either white or pastel-colored question sheets in a haphazard manner. Each question sheet was numbered—white question sheets were given uneven numbers, and colored question sheets were given even numbers. For each quiz, the instructor consciously tried to start with a different student, but class attendance and the focus of the instructor resulted in very little consistency in alternating distribution patterns.

FINDINGS

At the end of the semester, there were 266 scores for students who were given white question sheets and 255 scores for students who were given pastel-colored question sheets (odd-numbered quizzes were white, while even-numbered quizzes were pastel, so there may have been one more white quiz than pastel for each class, depending on the number of students taking the quiz). As outlined in Table 1, a $t$-test comparing the mean scores of the two groups of quiz scores revealed no significant difference between the 72.46% mean for students with white question sheets and 72.86% for students with pastel-colored question sheets.

Table 1
Comparison of Test Scores for Students with White Test Sheets and Pastel-Color Test Sheets

<table>
<thead>
<tr>
<th>Test Color</th>
<th>$N$</th>
<th>Mean</th>
<th>$SD$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>266</td>
<td>72.46</td>
<td>16.20</td>
<td>.783297</td>
</tr>
<tr>
<td>Color</td>
<td>255</td>
<td>72.86</td>
<td>17.00</td>
<td></td>
</tr>
</tbody>
</table>

These results suggest that color has no effect on student performance on tests; however, since these tests were readiness quizzes and accounted for only twenty percent of the student’s grade, it seems likely that many students did not take them very seriously. In casual conversation, students often asked, “Did you read the chapters?” suggesting that they did not actually study for them, but were content to guess their way through the objective quizzes.

CONCLUSION

The findings suggest that using pastel paper for quizzes is unlikely to affect student scores. The research, however, seems to indicate that color can affect scores when the colors used (red and blue, for example) trigger learned responses such as “warning” or “happiness.”
Using pastel colors may not affect student performance, so they may be used for different versions of a test to discourage cheating.

REFERENCES


