Cognitive Responses by West Texas Hispanic/Latinos to Agricultural News: A Comparison of Four English and Spanish Presentation Media

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Abstract

Agriculturists often seek ways to convey the importance of agriculture. Most professionals in agricultural education develop and research the effects of agricultural education programming with youth and adult populations. Agricultural communicators often seek descriptive information pertaining to effects of agricultural mass medium and on a diverse audience. This study focused on recall of an agricultural news story presented in various mass mediums to a sample of West Texas Hispanics/Latinos.

The study used an experimental posttest-only control-group design to compare four English and Spanish presentation media: newspaper print, electronic text, video news release, and radio news release. Participants were bilingual Hispanic/Latino attendees of the Texas Tech Raiders Rojos Back to School Fiesta (n=144). The participants were randomly assigned to one of eight treatment groups and a control group. The dependent measures included aided recall and unaided recall.

Results indicate significant differences in aided recall between English newspaper print and English electronic text, Spanish newspaper print, and Spanish electronic text. A significant difference also occurred between English video news release and Spanish electronic text. Results indicated a strong correlation between aided and unaided recall.

The authors suggest limiting time and resources on the production of Spanish language printed material targeting the Hispanic/Latino population of West Texas. The authors also suggest replication in similar Hispanic/Latino populations and other ethnic groups.
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Introduction

Leaders in the agricultural and natural resource industry have identified farm policy as a means of economic sustainability for the rural community. In the early 20th Century, the farm press was an authoritative source of rural public opinion, linking the farmer and rural America to federal and state political agendas affecting agriculture. The roles of these traditional, rural opinion leaders have evolved. Agricultural communicators now work in the areas of marketing, public relations, education, and journalism; however, they still seek and focus on areas to enhance and sustain the quality of life for agriculturists and rural residents (Shulman, 1999).

Today, agricultural communicators face an educational challenge, also referred to as agricultural literacy. Unlike previous generations, most Americans do not understand the dynamics of agriculture, including federal and state policy issues (Boone, Meisenbach, & Tucker, 2000). This claim is supported in a Delphi study conducted by Frick, Kahler, and Miller (1991), revealing agricultural policy as one of 11 broad subject areas falling within the area of agricultural literacy and communications.

According to Evans (in Boone et al., 2000), efforts in agricultural communications must mirror changes in culture, media, information systems, and agriculture. Advances in technology and agriculture have dominated issue discussions for several decades; however, the ethnic dimension of America is transforming like never before, especially the Hispanic/Latino population (U.S. Census Bureau, 2000a).

An investigation into media effects and usage among the Hispanic/Latino community is plausible. This assumption is based on the conclusion that little scholarly literature exists
concerning Hispanic/Latino media usage and effects, especially about issues pertaining to agricultural policy. In addition, inferential research must be included in communication and education research in order to move the disciplines forward. Tucker (1996) elaborates on the need for agricultural communicators to move beyond descriptive research.

The first barrier concerns the fact that little of our research extends beyond descriptive work. Indeed, most of us are more comfortable to describe our research in terms of methodology, such as “content analysis” or “readership survey,” than to address equally important issues of theoretical orientation. (p. 36)

The Hispanic/Latino population recently has surpassed the Black/African American population as the largest minority group in the United States. In the state of Texas, the Hispanic/Latino population percentage has increased from 27.1% in 1990 to 30.6% in 2000 (U.S. Census Bureau, 2000a). The percentage of Hispanic/Latino registered voters, as well as the voter turnout of Hispanic/Latino residents, also has increased. This growth of the Hispanic/Latino population has had a profound impact on America’s political and social landscape (Maharidge, 1998).

Agriculture is the largest industry in the South Plains of West Texas, accounting for more than $25 billion in revenue (Lubbock Chamber of Commerce, 2003). Furthermore, the Hispanic/Latino political and social presence has increased due to population growth and political unionization (Maharidge, 1998). For these reasons, agriculturists must investigate phenomena influencing growing populations’ political and social trends.

Doerfert, Akers, Haygood, and Kistler (2003) declared the media’s ability to influence social behavior, social change, and policy agenda as essential inquiry when analyzing biotechnology and food production issues. Inquiry was also recommended in the area of specific media effects as it relates to agricultural policy. These suggestions resulted from a case study conducted on the 2002 Oregon vote for mandatory labeling of genetically modified foods.
The purpose of this study was to determine if any measurable difference in unaided and aided recall resulted from various forms of mass media presented to the Hispanic/Latino population of the South Plains of West Texas. Solicited Hispanic/Latino participants were studied in order to determine if significant differences exist between those who consume agricultural policy news through the following media: English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release.

Research Hypotheses

The following research hypotheses, generated from the literature review, were tested.

1. Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in aided recall of local agriculture policy news.

2. Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in unaided recall of local agriculture policy news.

Theoretical/Conceptual Framework

Establishing the salience among the public so an issue becomes the primary focus of public attention is an initial stage in the formation of public opinion. The news media, through
various forms, exert a significant influence on perceptions of current salient issues. Furthermore, the news media can set the agenda for public thought, discussion, and debate (Cohen, 1963).

Contemporary theoretical support for mass communication affects on political and social issues comes from the agenda-setting theory. The theory of agenda setting can be traced to McCombs and Shaw (1972) who attempted to explain why and how people think about and ultimately rank various social issues. These researchers and theorists found a significant correlation between amounts of media coverage and issue importance ranking by news consumers. Ultimately, this finding led to the conclusion issue salience is greatly influenced by mass media. Agenda setting is considered a key component of the modern democratic process. 

*Figure 1* outlines the issue process in a democratic society. Agenda setting functions in the democratic process are located between interest groups and the media, between the media and the public, and between the public and the government. The primary focus of the agenda setting function in this inquiry is located between the media and the public.

*Figure.* Issue process in a democratic society. Adapted from Graber, 1993.
The notion of agenda setting is a positive association between mass media and news consumers. From agenda setting stems the formation of public opinions and the development of pros and cons of a particular social or political issue. The agenda-setting theory shifts the focus of inquiry away from immediate effects of mass media on attitudes and opinions to long-term effects on actual cognition. Put simply, agenda setting relies on the actual transfer of issues from the media to the public (Shaw, 1979).

**Literature Summary**

Comparisons of cognitive effects as a result of various presentation media is a dynamic phenomenon. In general adult populations’ recalls are much stronger when information is consumed via print; however, children recall more from television. Radio seems to produce less recall than any other medium (Beenjtes, Vooijes, & Van Der Voort, 1993; Boone, Miller, & Brown 1996; Furnham & Gunter, 1985; Kellerman, 1985; Newcomb-Trefz, 1987; Sundar, 2000).

Comparisons of cognitive effects as a result of various presentations are much different in other cultures, especially those outside the United States. These populations recall more from radio than Americans, while Americans perform better than other cultures with electronic text. Finally, it is concluded acculturation is a significant determent of Spanish versus English presentation in mass media. Hispanics/Latinos with a higher acculturation level recall more and prefer English presentation, while those less acculturated perform better with Spanish delivery (Facorro & DeFleur, 1993; Newton, 1986; Nicholls & Roslow, 1996; Stauffer, Frost, & Rybolt, 1981; Ueltschy & Krampf 1997; Valencia, 1985).

This particular investigation ultimately breaks new ground for cross-cultural and media effects research in agricultural communications. Few similar studies, measuring cognitive recall when exposed to various forms of media presentation, exist within the discipline (Boone, 1994).
Recommendations have been made for agricultural communicators to continue a focused research efforts on improving information and media communication so to educate clientele, especially with the vast quantity of information becoming accessible to citizens through new channels, such as the information superhighway (Boone et. al, 1996). Furthermore, Doerfert (2003) recommended more rigorous research designs in agricultural literacy studies.

**Methods and Procedures**

The study physically took place in the education facility on the Texas Tech University campus. Subjects for the study were solicited at the Back to School Fiesta sponsored by the Raiders Rojos, an alumni organization with a mission to assist higher education recruitment and retention efforts within the Hispanic/Latino community. The event time was approximately 11:00 a.m., August 16, 2003. The duration of the event was approximately four hours. The Back to School Fiesta brings more than 400 Hispanic/Latino families with higher education interests to the campus. Of the event participants, a majority were residents of the South Plains of West Texas.

Four classrooms were used to facilitate the eight treatments, while one classroom was reserved as a holding area and control group testing area. Each of the four treatment rooms were used to establish areas specific to delivery medium: newspaper print, electronic text, radio news release, and video news release. One round of treatments was administered using a randomly selected English version of all media. The second round of treatments used a randomly selected Spanish version of all media. Participants were randomly assigned to control treatment throughout the entire study.
The subjects were then presented with one of the eight forms of presentation medium or a control function. All news media, or treatments, provided the same content. The first of three news stories provided content about Charles Taylor, president of Liberia, stepping down from power. Because this story is of no significance to agricultural issues, it was used as an initial “dummy” story. The second story, the one of particular interest, provided information pertaining to the importance of the 2002 Farm Bill. The third and final story, also used as a “dummy” story, named President George Bush’s choice for chair of the Environmental Protection Agency.

Immediately after the treatment, cognition levels were determined through unaided, then aided recall. In unaided recall, subjects were asked to recall as much information about the three news stories as possible. The aided recall followed and consisted of a multiple-choice examination. Content pertaining to story two, the 2002 Farm Bill, was the only information tested in the aided recall portion of the instrument.

Control group participants were asked to complete the demographic portion of the questionnaire. Finally, they were asked to complete the aided recall portion of the measure. Again, the control group received no treatment and was used in the means comparison with the tested media groups.

The independent variable for this study was media presentation. The qualitative, independent variable consisted of nine treatment levels of different types. This is not to be confused with quantitative treatment levels, which refer to different amounts of a particular independent variable (Kirk, 1995). Multiple dependent variables were used in this study, two forms of recall, unaided and aided. Figure 2 offers a visual representation to the CR-9 design.
This design was applied in order to maximize experimental control, anticipating not needing ANCOVA to further equate the experimental groups (Hinkle, Wiersma, & Jurs, 1998). With this design, experimental control, statistical controls, as well as the fact all participants were randomly solicited and randomly assigned for the study, a more than adequate balance was achieved. This balance yielded tenable results.

The population consisted of Hispanic/Latino adults living in the South Plains of West Texas. A purposeful sample (n=144) was solicited from the Hispanic/Latino adult population attending the annual Back to School Fiesta sponsored by the Raiders Rojos of Texas Tech University. The maximum sample of 144 subjects was derived from a logistical standpoint.

**Figure 2.** Gall, Borg, & Gall (1996) posttest-only control-group, randomized subject design: $R = \text{random assignment}, O_1 = \text{posttest measures}, a_1 = \text{English newspaper print}, a_2 = \text{Spanish newspaper print}, a_3 = \text{English electronic text}, a_4 = \text{Spanish electronic text}, a_5 = \text{English radio news release}, a_6 = \text{Spanish radio news release}, a_7 = \text{English video news release}, a_8 = \text{Spanish video news release}, C = \text{control group}
Each classroom can accommodate no more than 16 subjects. Given the nine treatment levels of the independent variable and the classroom size of 16 subjects, 144 participants were solicited. Solicited individuals were not required to participate in the study. A Texas Tech baseball cap was given as an incentive to participate in the study. All participants were presented with a Human Subject’s Consent Form during the initial demographic data collection period. The consenting adults were randomly assigned as they agreed to participate to one of nine treatments. As soon as a class filled with 16 participants, the treatment began. The nine presentation media treatments were randomly ordered with English media, followed by Spanish media. They were administered accordingly. All treatment groups, including the control group, were equal in number (n=16).

The measurement and treatment instruments were tested for face and content validity by experts in mass media and the Spanish language. Both journalists at the Lubbock Avalanche-Journal and KXTQ FM, and Spanish translation specialists at the Graduate School of Texas Tech University were used in instrument and treatment development.

To establish internal consistency reliability before data collection, the multi-choice, or aided recall portion of the instrument was pilot tested among a sample (n=24) of Hispanic/Latino staff members at Texas Tech University. The reliability of the pilot test was measured by the Kuder-Richardson-20 (KR-20) formula upon completion. The reliability of the aided recall test was also measured by the Kuder-Richardson-20 (KR-20) formula upon completion of the immediate posttest. The Kuder-Richardson-20 is a common reliability measure for multiple-choice instruments in multi-modal presentation research (Rieber, 1991; Rieber, Boyce, & Assad, 1990). After removing one question, the remaining 12 items yielded an alpha level of 0.56 using the KR-20. This alpha level was deemed acceptable as they exceeded Nunnally’s (1967)
recommendation of 0.50 to 0.60 for initial stages of instrument development. The Kuder-Richardson-20 also yielded an alpha level of 0.61 for the aided recall portion of the analysis. This was deemed acceptable for the investigation.

Because the unaided recall section of the instrument was analyzed qualitatively, no statistical reliability tests were administered for the two portions; however, strict data analysis procedures ensure instrument reliability for these sections. Content analysis (Glesne, 1998) was used as a qualitative procedure in order to determine unaided recall effects of the presentation media.

For the unaided recall portion of the measure, all true points listed in the description were scored as +1. There were no untrue statements in the descriptions given by the participants; therefore, negative scoring was not used. The true points were summed for each story, and then the three stories were summed as well. Given the number of true points in the individual stories, the mean recall percentages for each story were consistent; therefore, equal recall from each story can be assumed. SPSS for Windows® was used for most data analyses.

**Result and Finding**

The sample consisted of 144 (n=144) bilingual adult Hispanic/Latinos of West Texas. Of the participants, 58 (40.3%) were male, while 86 (59.7%) were female. The average age of the participants was 35.9 (SD=11.6), with the oldest participant being 68 and the youngest 18. The median age of the participants was 36. Married participants comprise 60.1% of the sample, while 31.5% were single, and 8.4% were divorced. Of the participants, 69.9% were registered voters while 30.1% were not registered to vote. The voting percentage does not reflect, or attempt to reflect, actual voter turnout. The education level of the participants varied from no
schooling to graduate and professional degrees. The majority of the participants had a high school degree. Three participants indicated no formal education, while 11 reported a graduate or professional degree.

English print produced the highest average aided recall of 0.55 (SD=0.13). This medium was followed by English video new release with an average of 0.52 (SD=0.18). The lowest recall resulted from the Spanish electronic text with an average of 0.25 (SD=0.13). Table 1 reports mean scores, standard deviations, standard error, and confidence intervals for each treatment group.

Table 1
*Summary of aided recall for treatment groups.*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M</th>
<th>SD</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Print</td>
<td>0.55</td>
<td>0.13</td>
<td>0.42</td>
<td>0.46</td>
<td>0.63</td>
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<td>English Video News Release</td>
<td>0.52</td>
<td>0.18</td>
<td>0.42</td>
<td>0.43</td>
<td>0.60</td>
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<tr>
<td>Spanish Video News Release</td>
<td>0.40</td>
<td>0.16</td>
<td>0.42</td>
<td>0.31</td>
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<td>Spanish Radio News Release</td>
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<td>0.29</td>
<td>0.45</td>
</tr>
<tr>
<td>English Radio News Release</td>
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<td>0.16</td>
<td>0.42</td>
<td>0.28</td>
<td>0.44</td>
</tr>
<tr>
<td>Spanish Print</td>
<td>0.35</td>
<td>0.23</td>
<td>0.42</td>
<td>0.27</td>
<td>0.44</td>
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<tr>
<td>English Electronic Text</td>
<td>0.34</td>
<td>0.2</td>
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<td>0.26</td>
<td>0.42</td>
</tr>
<tr>
<td>Spanish Electronic Text</td>
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<td>0.13</td>
<td>0.42</td>
<td>0.16</td>
<td>0.33</td>
</tr>
<tr>
<td>Control</td>
<td>0.19</td>
<td>0.12</td>
<td>0.42</td>
<td>0.11</td>
<td>0.28</td>
</tr>
</tbody>
</table>

SE – Standard Error

The unaided recall portion of the instrument used content analysis to code the data. All true points listed in the description were scored as +1. There were no untrue statements in the descriptions given by the participants; therefore, negative scoring was not used. The true points were summed for each story, and then the three stories were summed as well. Given the number of true points in the individual stories, the mean recall percentages for each story were consistent; therefore, equal recall from each story can be assumed.
English print revealed the highest average of unaided recall at 14.69 (SD=8.65); however, due to high standard deviations, one must use caution in the analysis. The lowest unaided recall score occurred in the Spanish electronic text treatment group with an average score of 65.94 (SD=4.45). Table 2 provides data for each treatment group.

Table 2
Summary of unaided recall for treatment groups.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>SD</th>
<th>SE</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
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<td>English Print</td>
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<td>8.65</td>
<td>2.29</td>
<td>10.15</td>
<td>19.22</td>
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<tr>
<td>English Video News Release</td>
<td>14.00</td>
<td>11.25</td>
<td>2.29</td>
<td>9.47</td>
<td>18.55</td>
</tr>
<tr>
<td>Spanish Radio News Release</td>
<td>14.06</td>
<td>7.63</td>
<td>2.29</td>
<td>9.53</td>
<td>18.60</td>
</tr>
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<td>2.29</td>
<td>5.47</td>
<td>14.54</td>
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<td>Spanish Print</td>
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<td>10.65</td>
<td>2.29</td>
<td>5.41</td>
<td>13.51</td>
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<td>English Electronic Text</td>
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<td>2.29</td>
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<td>12.91</td>
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<td>0.00</td>
<td>2.29</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

SE – Standard Error

Research Null Hypothesis One

H₀₁: Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit no statistical differences in aided recall of local agriculture policy news.

The following research hypothesis was developed *a priori* at the _ = .05 level.

H₀₁:  _₁ = _₂ = _₃ = _₄ = _₅ = _₆ = _₇ = _₈

Hₐ₁:  _₁ ≠ _₂ ≠ _₃ ≠ _₄ ≠ _₅ ≠ _₆ ≠ _₇ ≠ _₈

As stated above, the null hypothesis of no differences being expressed between English newspaper print (_₁), Spanish newspaper print (_₂), English electronic text (_₃), Spanish electronic text (_₄), English radio news release (_₅), Spanish radio news release (_₆), English
video news release, and Spanish video news release, or there was no treatment effect in comparison across group means on a low-level aided recall posttest. The alternative hypothesis states significant measurable differences would be evident due to media presentation.

An analysis of variance (ANOVA) tests the null hypothesis of no difference in aided recall between English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups. Table 3 summarizes the results of an ANOVA used to test the hypothesis of no difference between the treatment groups.

Table 3
Analysis of variance comparing English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups on aided recall scores

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
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<tbody>
<tr>
<td>Between</td>
<td>1.63</td>
<td>8</td>
<td>19.59</td>
<td>7.28</td>
<td>.000*</td>
</tr>
<tr>
<td>Within</td>
<td>3.77</td>
<td>135</td>
<td>0.20</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>5.39</td>
<td>143</td>
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</table>

*significant at _ = .05

The obtained omnibus $F(8,135) = 7.28, p = 0.00$ was significant; therefore, the null hypothesis of no difference in aided recall between English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release treatment groups was rejected. The strength of the relationship between the dependent variable of aided recall and the independent variable of media was strong. Eta squared, $\eta^2$, was strong, with the treatments accounting for 30% of the variance for the dependent variable.

A post-hoc was then used to determine the location of the significance. The Levene’s test for equality of variances for unaided recall was not significant; therefore, the assumption of homogeneity of variances was satisfied (Kirk, 1995). As a result, a Tukey post-hoc comparison
was used to locate significant mean differences. Table 4 presents the results from the Tukey post-hoc comparison.

<table>
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<th></th>
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</table>

*p<.05

Significant differences exist in mean comparisons between English newspaper print and Spanish newspaper print, English newspaper print and English electronic text, English newspaper print and Spanish electronic text, and English video news release and Spanish electronic text. The control group also indicated significant differences with English newspaper print, English video news release, and Spanish video news release. Although the mean scores of all treatment groups were higher than the control, the mean differences were not significant for control and Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, and Spanish radio news release.

The analysis indicated an observed power of 0.91. A power greater than 0.80 is considered acceptable (Kirk, 1995). When the study is replicated, it is recommended researchers refer to Tang’s chart (Kirk, 1995, p. 814) in order to obtain the minimum number of subjects for the desired power. In order to achieve a power of 0.80 when replicating this study, Tang’s chart recommends a minimum sample size of 12 (n=12) for each treatment group.
Research Null Hypothesis Two

H₀₂: Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit no statistical differences in unaided recall of local agriculture policy news.

The following research hypothesis was developed a priori at the _ = .05 level.

H₀₂: _₁ = _₂ = _₃ = _₄ = _₅ = _₆ = _₇ = _₈

Hₐ₂: _₁ ≠ _₂ ≠ _₃ ≠ _₄ ≠ _₅ ≠ _₆ ≠ _₇ ≠ _₈

As stated above, the null hypothesis of no differences being expressed between English newspaper print (_₁), Spanish newspaper print (_₂), English electronic text (_₃), Spanish electronic text (_₄), English radio news release (_₅), Spanish radio news release (_₆), English video news release (_₇), and Spanish video news release (_₈), or there will be no treatment effect in comparison across group means on a low-level unaided recall posttest. The alternative hypothesis states significant measurable differences will be evident due to media presentation.

The Levene’s test for equality of variances for unaided recall was significant; therefore, the assumption of homogeneity of variances was not satisfied (Kirk, 1995). The null hypothesis that the error variance of the dependent variable is equal across all groups is rejected. Table 5 reports Levene’s test for equality of error variances.

Table 5
Levene’s test for equality of error variances for unaided recall

<table>
<thead>
<tr>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.63</td>
<td>8</td>
<td>135</td>
<td>.000</td>
</tr>
</tbody>
</table>

The reported standard deviations for the means were significantly high as well. As a result, unaided recall was not used in mean comparisons. The results of the correlational
analyses presented in Table 6 illustrates the correlation of aided and unaided recall as statistically significant ($r=.51$).

Table 6  
*Correlations among the three dependent measures*

<table>
<thead>
<tr>
<th>Aided recall</th>
<th>Unaided recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aided recall</td>
<td>--</td>
</tr>
<tr>
<td>Unaided recall</td>
<td>0.51*</td>
</tr>
</tbody>
</table>

*p<.0166

The correlation of aided recall and unaided recall was substantial. This validated the close association between the recall measures used in the study.

**Conclusions**

**Demographics**

In this study, 92% of the participants reported being born in the U.S. The national average is between 55% and 60%. However, the percentage of West Texas Hispanic/Latinos born in the U.S. is around 85% (U.S Census Bureau, 2000c). Ninety-two percent of the participants in this study were born in the U.S. As a result the generalization of the sample of participants at the Raiders Rojos Back to School Fiesta to the actual population of West Texas Hispanic/Latinos is strengthened.

**Research Hypothesis One**

Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in aided recall of local agriculture policy news.
The results from this study indicated a statistical significance in aided recall for English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release. A post-hoc test identified the significant mean separation among treatment groups.

Significant differences existed between English newspaper print and Spanish newspaper print, English newspaper print and English electronic text, English newspaper print and Spanish electronic text, and English video news release and Spanish electronic text. The control group also indicated significant differences with English newspaper print, English video news release, and Spanish video news release. Although the mean scores of all treatment groups were higher than the control, the mean differences were not significant for control and Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, and Spanish radio news release.

These findings are consistent with the literature, which expresses print superiority with adult populations (Furnham & Gunter, 1985). Furthermore, these findings are similar to cross-cultural studies pertaining to recall and modality (Facorro & DeFleur, 1993). Again, literature specific to Hispanic/Latino populations and modality recall was not evident in the extensive literature review.

Research Hypothesis Two

Hispanic/Latino participants in the media presentation groups of English newspaper print, Spanish newspaper print, English electronic text, Spanish electronic text, English radio news release, Spanish radio news release, English video news release, and Spanish video news release will exhibit statistical differences in unaided recall of local agriculture policy news.
Because the Levene’s test for equality of variances for unaided recall was significant, the assumption of homogeneity of variances was not satisfied (Kirk, 1995). The null hypothesis that the error variance of the dependent variable is equal across all groups is rejected. Conclusions from this hypothesis are not tenable; however, the correlation \( r = .51 \) between aided and unaided recall supports the accuracy of the two measures used in the study.

**Discussion**

*Descriptive*

The means reported in the aided recall portion produced an interesting order. The highest mean recall score resulted from the English print treatment group. The rest are ordered as follows: English video news release, Spanish video news release, Spanish radio news release, English radio news release, Spanish print, English electronic text, and Spanish electronic text. The qualitative data from the unaided recall measure were coded, and the means resulted in the following order from highest to lowest: English print, Spanish video news release, English video news release, Spanish radio news release, English radio news release, Spanish print, English electronic text, and Spanish electronic text. It is interesting how mass media research often contradicts educational research, which claims dual-coding as a significant factor in recall. If this is the case, why does print continue to express higher recall among adult populations?

The design of this study was experimental in nature, thus the low sample size (n=144). The researcher realizes caution must used when generalizing these results as descriptive to the general Hispanic/Latino population of West Texas. Although the characteristics of participants resembled the characteristics of the West Texas Hispanic/Latino population, one must yield caution when generalizing the findings in the study.
The mean scores of unaided recall could not be compared and contrasted due to homogeneity of variances issues. However, the aided-recall portion of the dependent measure produced tenable results. The post-hoc test revealed English newspaper print as significantly better than Spanish newspaper print, Spanish electronic text, and English electronic text. Furthermore, the post-hoc revealed English video news release as significantly better, in terms of cognition, than Spanish electronic text. When these cognitive results are associated with the agenda-setting theory, it is important to place printed publications pertaining to the importance of agriculture in the hands of individuals who will consciously read them. It also is interesting to look at the significance of the English video news release, especially when it is associated with the media consumption variable.

The linear relationship between aided recall and unaided recall not only strengthens the findings of the aided recall portion of the measure, it adds credibility and validity to multiple-item instruments used in media research. It also is important to consider the strength of the relationship (r=0.51).

Based on this study’s findings and conclusions, recommendations for practitioners and for further research have been made.

Recommendations for Practitioners

Literature pertaining to media campaigns strongly encourages an in-depth needs assessment when addressing any population through mass channels. Media campaigns are much too complex to associate one particular channel to cognitive gain, affective change, and overall behavior intent; however, one must heavily consider research pertaining to media effectiveness as the population is assessed.
It is recommended by the researcher that media campaign developers and practitioners consider outcomes of this study when addressing the Hispanic/Latino population of West Texas, especially as it relates to agricultural issues. Listed below are recommendations for addressing the Hispanic/Latino population of West Texas on agricultural issues. These were generated by the researcher as a result of the literature review and study results.

1. Use a variety of media channels when possible. There is a direct correlation between channel diversity, exposure time, and overall campaign effectiveness.

2. When limited to cross-cultural, non-specific targets, keep in mind the limited consumption and overall ineffectiveness of Spanish language printed material. However, the Hispanic/Latino culture considers these sources as highly credible.

3. Because of limited consumption time and a lack of overall cognitive effectiveness, direct resources away from electronic text channels, especially when seeking Hispanic/Latino adult populations of West Texas.

4. As the Hispanic/Latino population of West Texas becomes more acculturated, cultural-specific campaigns, as it pertains to channel and language, become less important. Resources are better spent by campaign planners and practitioners who concentrate on cultural-specific content.

Again, an in-depth, comprehensive needs assessment is recommended by the researcher when planning or facilitating any mass media campaign, especially when specific or cross-cultural populations are targeted. It also is suggested practitioners stay informed and educated on current trends of media effectiveness research and theory.
**Recommendations for Further Research**

First, it is recommended this study be replicated to determine if the current study’s findings are consistent. Replications should take place in various Hispanic/Latino settings in West Texas. Also, replications should be performed with extended treatment periods, similar to a 30-minute news program. Because of the strong correlation of unaided and aided recall scores, it is recommended to discontinue unaided recall replication in order to perfect aided recall measurement. In order to measure delayed recall, it is important to solicit a population that can easily be contacted after an extended period. Delayed recall by mail survey was attempted in this study, but due to a low response rate and the resulting unequal treatment groups, statistical analysis could not be conducted on this measure.

Finally, it is recommended the study be replicated with a Caucasian population in West Texas. This would yield insight to cross-cultural associations of mass media effectives and consumption. Facorro and DeFluer (1993) provide evidence that people of different societies and cultures learn from news differently, even when content and conditions of exposure are identical.
References


