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Abstract

Alabama county Extension agents' circular letters and newsletters (2.5 million pieces in 1998) were found to be two grade levels higher than the reading level of the average U.S adult, and 85 percent of Alabama 4-Hers.

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Alabama county Extension agents' circular letters and newsletters (2.5 million pieces in 1988) were found to be two grade levels higher than the reading level of the average U.S. adult, and 85 percent of Alabama 4-Hers. If this means that these materials are difficult to understand, agents need to write pieces aimed at lower reading grade levels. The study showed that agents would increase readability if they devoted more time to writing. Sensitizing agents to this need and providing learning opportunities in writing for readability are suggested.

Introduction

Written educational material is produced at both the state and county levels by the Alabama Cooperative Extension Service (ACES). At the state level, most of this material is in the form of subject-matter bulletins, while at the county level it falls into two main categories — newspaper material and mass mailing material. Some of the newspaper and mass mailing material is written at the state level by communications specialists, and then edited and rewritten by county agents to "localize" them. However, much of

the material is written first-hand at the county level, with no input from state Extension staff. The county agent bears the responsibility of ensuring that this educational product is written effectively for the intended audiences. The newspaper material is subject to editing by the newspapers which use the written pieces, but the mass mailing written material goes out to Extension clientele directly from the county agent. For this reason the mass mailing material best exemplifies the educational written product disseminated by county agents.

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Mass mailing material includes newsletters and circular letters. Newsletters are generally sent on a regular schedule, such as monthly or quarterly. An Extension newsletter may be subject-matter specific, or it may cover a variety of subject matter topics. A circular letter concerns a specific topic, and is sent on an as-needed basis. Both newsletters and circular letters customarily are sent to clientele whose names are on specific mailing lists maintained by the county agent.

Mail material has a high impact on educational program delivery by ACES. The following figures from Lee County illustrate its educational role. For the six-month period from January 1-June 30, 1988, 18,821 individual pieces of mail were sent from the Lee County Extension office, a county which is average in use of mail material. On this basis, an estimated 2,522,014 pieces of mail are sent annually from the 67 county offices of ACES. The majority of these pieces are in the form of mass mailings. In a research study, *Bringing Extension Services to Alabamians: A Statewide Survey of Information Needs and Awareness* (Mullins, 1982), 69 percent of 1,220 Alabama adults interviewed ranked newsletters first among several information dissemination methods.

The extensive use of mail material by county agents and the expressed public approval of this educational delivery method point to the need for such materials to be written at a readability level that is appropriate for the intended audience.

Readability is the ease of understanding or comprehension due to the style of writing (Klare, 1984). Use of readability principles involves matching reading level of the written material with reading ability level of intended audiences. Flesch (1951)

emphasized the importance of the writer identifying his audience, stating, "There's no point in controlling readability if you don't know who you are writing for" (p. 25).

A readability formula is a method of measurement which provides an estimate of the style difficulty of writing (Klare, 1963). Readability formulas, developed mainly in the 1940s, today are being used widely in schools, libraries, businesses, government, newspapers, and magazines (Fry, 1986).

Klare (1963) reported that two factors emerge in assessing style difficulty of writing: a word factor and a sentence factor. Word length and sentence length were the basis of most of the earlier readability formulas. Present formulas in large part are still based on word difficulty (number of syllables) and sentence length (Collins and Cheek, 1989). These researchers reported that among the more popular formulas presently in use are the Fry Readability Graph, the Flesch Reading Ease Test, Aukerman's formula, the Dale-Chall formula, the Spache formula, and the SMOG formula.

Limitations of readability formulas have been recognized since their inception, and several were cited by Klare (1963), Collins and Cheek (1989), and Spache (1963). Klare indicated that formulas measure only one aspect of writing, namely style, and only one aspect of writing style, namely difficulty, and the latter only imperfectly, because they appear to give scores accurate to about one grade level. Furthermore, formulas do not take into account the different interests, purposes, background, intelligence, maturity, and motivation of readers. Collins and Cheek made two other important points, namely that there is no formula which measures concepts, and that the

specialized vocabulary in all content areas tends to raise the readability grade level of the material. Spache also reported that formulas do not consider the impact of content or literary quality on the reader's interest.

Recognizing that readability formulas have several limitations, researchers urge caution in using them. However, they generally agree that formulas render valuable service in providing an estimate of the readability grade level of a written selection (Collins and Check, 1989; Spache, 1963). The primary goal for using readability formulas is to influence reader behavior. Klare (1984) reported evidence that clearly supports the fact that improved readability can produce increase in (1) comprehension, learning, and retention; (2) reading speed and efficiency; and (3) acceptability or preference of materials.

Little research has been done on readability of Cooperative Extension Service written materials. Most of this relates to materials written by state specialists. Reyburn (1979) conducted a national study on readability of 4-H project books, and found that 75 percent of the material was written for 7th grade and higher, while about two-thirds of the 4-H audience was enrolled in grades 4-5-6. Written material targeted to a specific Extension audience was examined by Nehiley and William (1980). They assessed the readability of two Florida Extension publications, an original publication and one targeted to a limited resource audience. The original bulletin was written at the 12th grade level, and the targeted bulletin at the 6th grade level.

One study was found in the literature which examined readability of Extension written materials pro-

duced at the county level. Upchurch (1969) assessed the readability of newspaper articles written by North Carolina agricultural agents. He found that 65 percent of the agents wrote articles above the 12th grade readability level. Upchurch also found that agents with graduate study in adult education tended to write articles with a lower readability grade level, and thus more appropriate for a general public audience.

These studies indicate that perhaps much of Extension material is written at a level higher than the reading level of intended audiences. Mavrogenes (1988) reported that the average adult in the U.S. reads at the 9th grade level. The Alabama Cooperative Extension Service, according to state staff communications specialists, has limited knowledge of the readability of mass mailing materials produced and disseminated at the county level. If these educational written materials are to be effective, Alabama county agents must know the reading ability of their audiences, and use readability principles in writing for these audiences.

Purpose and Objectives

The purpose of this study was to assess the readability of the mass mailing written material produced and disseminated at the county level of the Alabama Cooperative Extension Service.

The objectives were to:

1. Assess the readability of the mass mailing written material produced at the county level of ACES.
2. Determine if a significant model existed explaining a portion of the variance in the readability of mass mailing written material from selected personal and program characteristics.

Procedures

Population and Sample. The target population was the ACES county agents who had been employed by the organization for at least one year. The frame included 246 agents. A simple random sample of 100 agents was drawn from the identified frame. The minimum required sample size was determined to be 78 using Cochran's formula (Snedecor & Cochran, 1980).

Instrumentation. Two instruments were used: (1) A brief survey questionnaire covering agents' personal and professional information, and information on their interest/training in writing; and (2) the Fry Readability Graph.

The questionnaire was reviewed for content validity by a panel of 11 experts, all of them from Louisiana, including an LSU School of Vocational Education faculty member, a parish (county) Extension agent, an LCES state specialist, a vocational education teacher, two vocational education doctoral students, and five graduate committee members. It was also field tested for further validation with six parish agents of LCES.

Agents were asked to provide samples of their written mass mailing material. The Fry Readability Graph was used to assess the readability grade level of these pieces. The Fry Readability Graph was selected because: (1) It can be used with materials written at all levels; (2) It provides a fast and simple method of determining readability grade level; and (3) It is familiar to those in the reading field, and the availability of a simple hand calculator has added to its simplicity. The Fry Readability Graph utilizes a continuous range of scores from grade one through grade 17, and its accuracy in prediction of reading difficulty is within about a grade

level (Fry, 1968). The Fry graph has been validated by interformula and comprehension scores, with the Fry method producing scores similar to other readability formulas (Fry, 1977). Fry (1968) reported his Readability Graph to correlate .78 with Botel, .94 with Dale-Chall, .96 with Flesch, and .98 with the SRA formula.

Data Collection. The initial mailing of the questionnaire and cover letter was done in October, 1988. One week prior to this, agents in the sample had received a letter of endorsement of the study from Dr. Ann E. Thompson, Director, ACES. Two weeks after the initial mailing all non-respondents were sent a reminder postcard. Second and third mailings of the cover letter and questionnaire were made at two-week intervals.

The sample of 100 agents was decided upon to compensate for potential non-response. A 90 percent response rate was anticipated. If the response rate was less than this, a follow-up was planned by telephone to elicit response from a 50 percent random sample of the nonrespondents. Ninety-eight (98 percent) of the 100 agents responded, and 97 (97 percent) responses were usable. Because of the high response rate, the telephone follow-up of non-respondents was not conducted.

Agents were asked to send three of their recent mass mailing pieces on agriculture or home economics, written for educational purposes (more than just a meeting announcement). Agents with both youth and adult job responsibilities were asked for written materials intended for each audience.

The 97 agents provided 273 usable written pieces. (One agent provided no written material, but did respond to the questionnaire. Also,

one of the agents providing written material did not respond to the questionnaire.) Ten agents provided only written material intended for a youth audience. Sixty-one agents sent only material intended for an adult audience. Twenty-five agents provided examples of both youth audiences and adult audiences written material. Of the 273 usable pieces, 215 were intended for adult audiences and 58 for youth audiences. Regarding subject-matter content, 135 concerned agriculture, and 138 home economics. The distribution of the written materials by intended audience and subject matter is shown in Table 1.

The readability grade level of each written piece was assessed using the Fry Readability Graph. This requires a count of average number sentences per 100 words and average number of syllables per 100 words. On agents' written pieces one page or less in length, the first 100 words and the last 100 words were used as samples. On pieces longer than one page, a 100-word sample from the middle of each page was used. The readability grade level assigned for each piece was the average of all 100-word samples selected from that piece.

Data Analysis. The alpha level was set at .05 a priori. Statistical

analysis was accomplished as follows: (1) Descriptive statistics were used to provide a description of the responding county agents, and to indicate the readability grade level of agents' mass mailing written material. (2) Stepwise multiple regression was used to determine the amount of variance in the readability of agents' mass mailing written material that could be explained by selected variables. The variables included in the analysis were gender, age, race, highest educational attainment bachelor's degree, highest educational attainment master's degree, highest educational attainment master's degree plus, number of semester hours beyond the master's degree, bachelor's degree area of study, master's degree area of study, years of employment by Extension, hours spent weekly writing for Extension clientele, number of university courses (beyond freshman English) taken in writing, interest in writing, hours of inservice communication training, adult audiences, youth audiences, agriculture subject matter, and home economics subject matter.

Description of Alabama County Agents

Agents' mean age was just over 40 years, and agents' mean years of

Table 1: Respondents' Mass Mailing Written Materials by Intended Audience and Subject Matter

Written Material	Agents no.	Pieces no.
Adult audiences	86	215
Youth audiences	35	58
Agriculture	49	135
Home Economics	47	138
Adult agriculture	48	120
Youth agriculture	11	15
Adult home economics	38	95
Youth home economics	24	43

employment by Extension was about 15. Agents were almost evenly divided between males and females. Almost a fourth of the agents were black, and just over three-fourths were white.

A fourth of the agents had only a bachelor's degree, and the remainder had a master's degree. A third of the agents had taken course work beyond the master's degree, with the mean semester hours taken about 10. Just over half the agents had a bachelor's degree in a technical agriculture or home economics area, and the remainder had the degree in agricultural or home economics education. Just over half the agents with a master's degree earned the degree in education, and the remainder had the degree in a technical area.

Forty percent of the agents had taken no university writing courses beyond the freshman English level. Forty-three percent of the agents had taken only one college writing course beyond freshman English. The agents' mean hours of inservice communication training in the last five years was about 13. Over half the agents liked writing, one fifth disliked it, and one-fourth were ambivalent. On an average, agents spent almost six hours weekly writing for Extension clientele.

Readability Grade Level of Agents' Mass Mailing Written Material

Readability grade level was calculated on 273 pieces of written material, grouped by the two

variables of intended audience and subject matter.

Table 2 shows that adult audiences material (M= 11.2) was written at a readability level about one and a half grades higher than youth audiences material (M = 9.6). Agriculture material (M= 11.2) was written at a readability level about a grade higher than home economics material (M= 10.4). About a three-grade difference existed between adult agriculture (M= 11.6) and youth agriculture (M= 8.5), while less than a one-grade difference separated adult home economics (M= 10.8) and youth home economics (M= 10.1).

Regression Analysis of Readability

Two criteria were used to select the variables which were included in the stepwise regression analysis. The first criterion was degree of correlation between the independent variables and readability (with $r = .1$ or greater for a variable to be included), and the second criterion was evidence of multicollinearity between independent variables. As a result seven variables were included, and six of them explained 13.36 percent of the variance. These variables were: highest educational attainment bachelor's degree, gender, hours of inservice communication training, semester hours beyond the master's degree, highest educational attainment master's degree plus, and hours spent weekly writing for Extension clientele.

Results of the regression analy-

Table 2: Readability Grade Levels for ACES Mass Mailing Written Material by Intended Audiences and Subject Matter

	Adult	Youth	Overall
Agriculture	11.6 (SD=2.6)	8.5 (SD=2.1)	11.2 (SD=2.3)
Home Economics	10.8 (SD=2.2)	10.1 (SD=2.3)	10.4 (SD=1.8)
Overall	10.7 (SD=2.4)	9.6 (SD=2.3)	

sis are shown in Table 3. Highest educational attainment bachelor's degree was the variable which entered first in the regression model, and it explained 4.6 percent of the variance in readability. Gender accounted for about 3 percent of the variance, with the remaining four variables each accounting for less than 2 percent of the variance in readability.

Conclusions

Readability Grade Level of Agents' Mass Mailing Written Material. Agents' mass mailing written material intended for adult audiences was written at a mean readability grade level of 11.2, or just over the 11th grade level. This means that the average readability grade level for adult audiences material was about two grades higher than the reading level of the average adult in the U.S., which is 9th grade (Mavrogenes, 1988). In fact, as many as two-thirds of the agents submitting adult audiences material wrote this material at an average readability level of 10th grade or higher, again beyond the reading grade level

of the average U.S. adult.

Agents' mass mailing material intended for youth audiences was written at a mean readability grade level of 9.6, or about midway between 9th and 10th grade. Seventy-five percent of Alabama 4-H members are 7th graders or lower and 86 percent are 8th graders or lower. The average Alabama youth enrolled in school reads at grade level (A. C. Hess, personal communication, October, 1988). This means that, on the average, material for youth audiences was written at a readability grade level higher than the reading grade level of 86 percent of the intended audience.

Agriculture subject matter material ($M = 11.2$) was written at a readability level about a grade higher than home economics material. It is the personal opinion of this researcher that, generally, agriculture subject matter material is communicated in more technical terms than home economics subject matter material.

Regression Analysis of Readability. Six variables were signifi-

Table 3: Multiple Regression Analysis of Readability of Agents' Mass Mailing Written Material (n = 97)

Source of Variation	SS	df	MS	F-ratio	prob. of F
Regression	55.16	6	9.19	2.321	.040
Residual	357.82	90	3.98		

Variables in the equation

Variable	R ²	cum R ²	b
Highest ed. attainment bachelor's degree	.0462	.0462	-.7425
Gender	.0299	.0760	-.6072
Inservice communication training	.0175	.0936	.0396
Semester hours beyond the master's degree	.0184	.1120	.0608
Highest ed. attainment master's degree plus	.0104	.1224	.5254
Hours spent weekly writing for Ext. clientele	.0112	.1336	-.0680

Variables not in the equation

Variable	t	sig t
Youth audience	.146	.8839

cant in explaining 13.36 percent of the variance in readability. Three of the predictors were positive and three were negative. Positive predictors were inservice communication training, semester hours beyond the master's degree, and highest educational attainment master's degree plus. Negative predictors were highest educational attainment bachelor's degree, gender, and hours spent weekly writing for Extension clientele.

Readability grade level of written material tended to increase with agents' higher educational attainment. As educational level increases, there are more abstractions and difficult concepts to be learned. Perhaps this increased complexity of knowledge and thinking is reflected in one's writing. Readability grade level of materials tended to increase with increase in agents hours of inservice communication training. Again, the conclusion could be drawn that, with additional training, concepts learned become more abstract and difficult, and this increase in complexity is reflected in higher readability of written material.

Although males tended to write at higher readability grade levels than females, it is difficult to draw a general conclusion from this finding. Again, this researcher believes that the difference is related to subject matter. All agriculture material was written only by males, and all home economics material was written only by females. A similar conclusion about subject matter (agriculture material written at a higher readability grade level than home economics material) was drawn with regard to Objective 1.

Readability grade level tended to decrease as agents spent more time on writing for Extension clientele. It

may be spending more time in writing simply because they are producing a greater quantity of written material. This possibility was not resolved in this study. Nevertheless, it could be concluded that at least a portion of the decrease in readability level can be attributed to the additional time spent by agents on making their written pieces more appropriate for intended audiences.

Recommendations

It would be appropriate for the ACES to include the topic of writing for readability in future inservice communication training. At such training, agents could be introduced to the concept and principles of readability, and apprised of the results of this study, particularly the finding that their mass mailing materials have been written at higher readability grade levels than the average reading grade levels of both adult and youth audiences. They could be instructed in and given the opportunity to practice writing techniques which will enable them to write at grade levels appropriate for the intended audiences. Subjects to be taught might include basic readability principles, particularly average sentence length and average word length, calculating readability of written materials using the Fry Readability Graph, and revising materials to improve readability. Instruction might also include other readability criteria such as active voice, relative clauses, antecedents, connectives, organization of materials, and density of concepts (multiple ideas within a sentence).

Studies are recommended within the Cooperative Extension Services to assess the readability of state and county level written educational materials in relation to reading ability of specific audiences, and to

identify other variables that might contribute to the readability of written Extension materials.

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