

Correlational and Predictive Attributes of Demographic Factors and Their Relationship to Hispanic Participation in Texas Extension Programs

Ruben J. Saldaña

Texas Cooperative Extension

David Lawver

Texas Tech University

James Lindner

Scott Cummings

Texas A&M University

Hansel Burley

Marvin Cepica

Texas Tech University

Introduction

In keeping with its mission, Extension education continues to change its programs to meet the needs of a changing society. Once a rural, agrarian state with the bulk of the population concentrated in the eastern portion of the state, Texas has changed significantly in the last century. By 2030, trends suggest a population that is 63% ethnic minority and is poorer, less educated, and less equipped to compete globally. Growth patterns suggest increases in demand for owned housing, health care, personal care costs, and reduced demand for traditional educational services. The future of Texas is one of increased use of welfare and human service programs, lower per capita tax revenues, and increased government costs (Murdock et. al, 1997).

For an agency dedicated to education and, in addition, one that is non-formal in nature, Extension has great potential to position itself to meet the educational needs of Hispanic audiences if it can dedicate itself to reducing institutional barriers, developing relevant competencies among its faculty, and implementing methodologies that will serve the specific needs of Hispanic audiences. Otherwise, Extension may be perceived as a traditional educational service that serves a very narrow audience and not valued as highly by nontraditional audiences or viewed as a contemporary provider of educational programs and services.

Bernard Jones, former chair of ECOP, Dean and Director of Nevada Cooperative Extension, stated that the land grant system, including Cooperative Extension, was not created with a narrow focus on agriculture. He went on to say that the land grant system was created based on societal needs of the people and of the nation and the mission of Extension reflects this strong commitment to the needs of people. Further, he indicates that Extension cannot expect a great future if it remains primarily focused on 2% of the

population involved in production agriculture. Jones insisted that only quality programs will receive funding in the future and while Extension has quality programs, it also has a number of outdated programs. Extension must also hire more diverse faculty and must expand the scholarly achievements of faculty to assure that they maintain credibility and respect among peers and the public (Jones, 1992).

As a provider of non-formal education, Extension is in a position to respond to the needs of the fast growing Texas Hispanic community by developing and delivering appropriate educational responses that can be helpful to Hispanic audiences throughout Texas and the nation. An understanding of the specific needs of this audience and the skills to effectively develop, deliver, and evaluate educational programs to these audiences is critical to any successful effort. A three-year average of reporting data (2001–2003) from the Texas Cooperative Extension report database (TCE, 2003) showed an average of 58,049 records per year, 132,176 group methods per year, and 2,908,715 educational contacts per year. Of those contacts, Hispanics accounted for an average of 683,485 per year, or 23.5%. At this level and considering the 33.9% Hispanic share of the Texas population, Extension programs are reaching Hispanics at a 69.3% parity level (Census, 2002).

Parity was used as a performance factor in this study to describe the degree to which Extension agents successfully reached Hispanics in their county at a level that mirrored the demographics of the county. It was also used as a way to compensate for the range of differences in Hispanic populations throughout the 254 counties in Texas. The use of the term parity was in the place of formal legal terms such as disparate treatment or disparate impact because it was the purpose of this study to identify variables that could reasonably lead to higher levels of Hispanic participation in Extension programs and not to identify elements of Texas Extension programs that had discriminatory intent or effect. Nonetheless, the issue of civil rights cannot be separated from studies that explore reasons why certain protected populations are not served or do not benefit from public services in equitable proportions to mainstream populations.

Further analysis of state reporting data by state goal and by selected identifier codes allowed more precise description of data relevant to this study. Table 1 illustrates Hispanic participation in each of four state goals and parity levels for each goal. State Goal 1 is related to the issues of health, safety, and well-being and showed the highest percentage of Hispanic participation at 33.8%. This participation rate is 99.7% of parity. Parity was calculated by dividing percent participation by 33.9%, a fixed factor that represented the percent Hispanic population for Texas.

On the opposite end of the scale, the state goal dedicated to economic competitiveness, goal 3, had a participation rate of 13.2% Hispanics, 38.9% of parity. The other two goals, environmental stewardship and life skills/leadership, showed 21.6% and 21.3% Hispanic participation, respectively. These statistics place Extension programming for one goal at parity with the population and leave the other three goals at significantly lower levels ranging from 38.6% to 63.7% of parity.

Table 1. *% Hispanic participation and parity levels by state goal, 2001-2003*

State Goal	Health (1)	Env. Stew. (2)	Econ. Comp (3)	Life Skills (4)
% Hispanic Part.	33.8	21.6	13.2	21.3
% Hisp. Pop. (2002)	33.9	33.9	33.9	33.9
% Parity	99.7	63.7	38.9	62.8

To further describe current levels of Hispanic participation in Extension programs, monthly report data was retrieved according to a variety of statewide initiatives. A total of 38 statewide initiatives were examined. Only 11 of the 38 initiatives selected met or exceeded parity. Overall, Extension's average for Hispanic participation falls below that of their share of the population. While some programs clearly exceed parity, others fall sufficiently short of it so as to draw the organizational average to its level at 69.3% of parity.

The need to improve Hispanic outreach in TCE has been driven by fast changing demographics in the state, state administrative support for a state diversity plan, including staffing priorities for minority faculty and emphasis on hiring county faculty that reflect the demography of the state and the counties they serve (Gillespie, 2003). Furthermore, Gillespie (1996) provided evidence that Hispanics will participate in Extension programs given the opportunity, relevant programs that meet their needs, and appropriate educational approaches. Gillespie (1996) cited a finding in her five-year project for Texas Cooperative Extension that Hispanics were eager to participate in Extension educational programs. These findings challenge the common assumption that a lack of participation by Hispanics is caused wholly by their lack of interest and has no relationship to organizational variables. Conversely, these findings support the need for more detailed study of variables that affect Hispanic participation in Extension programs and eliminate audience initiative or interest as the lone variable(s).

Theoretical Framework

Knowles' et al. (1998) core principles of adult learning are a critical framework from which to consider strategies that could improve programs and services for Hispanics. While some references to pedagogical theory were cited, adult learning theory is considered most relevant to this study for three reasons. One is that the majority of Extension audiences are adults (TCE, 2003). The second is that the nature of non-formal education employs program development and delivery processes that are consistent with adult learning theory (Harman, 1976). Finally, much of the pedagogical theory is shifting from a teacher-centered focus to learner-centered approaches such as "learning communities" that are also consistent with Knowles' learning theory (Reyes, Scribner, & Scribner, 1999).

Grossman (1984) found that ethnicity was a factor in successful educational approaches for Hispanics. Hispanic learners whose teachers were also Hispanic experienced greater success in school while those with non-Hispanic teachers didn't.

Non-Hispanic teachers were also less likely to make accommodations for Hispanics. However, as non-Hispanic educators gained experience working with Hispanic learners, the differences in student performance based on ethnicity declined.

Warrix and Bocanegra (1998) found that efforts to reach Hispanic Day Care Providers in the Cleveland area were more successful when Hispanics were placed on Extension advisory committees and involved in focus groups that. Cano and Bankston (1992) studied minority participation in the 4-H program. They found that a lack of role models among agents, staff, and volunteers affected participation.

Finally, Hispanics are overrepresented in urban areas. According to U.S. Census data, (U.S. Census, 2003), the proportion of Hispanics living in urban areas exceeds that of the population as a whole. While only 58% of the composite state population lives in the six most populous counties in Texas, approximately 67% of Hispanics reside in the largest six urban areas. This suggests that urban areas could be a factor in reaching Hispanics.

Purpose and Objectives

The purpose of this study was to identify demographic variables that affect the levels of Hispanic participation in Texas Extension programs. Given Extension's charge to serve the people of Texas and given that Hispanics are underrepresented in many Extension programs, this study compared the dependent variable "program parity" to a series of demographic variables to determine those factors positively and negatively correlated to the level of Hispanic participation in a given county program. Program parity allowed for the comparison of Hispanic participation in a given county program to be compared to the Hispanic population in that given county rather than to a state average. To assure broad representation of programs, the study included agriculture and natural resources, family and consumer sciences, 4-H and youth development, and community development programs. It also included the full scope of field-based Extension agents from both Texas Cooperative Extension (1862) and the Prairie View A&M Cooperative Extension Program (1890).

The following objectives were identified for this study:

1. What demographic variables are correlated to Hispanic participation in Texas Extension programs?
2. What characteristics do demographic variables possess in predicting Hispanic parity, or participation, in Texas Extension programs?

Procedures

The population of this study included all Extension agents working on behalf of Texas Cooperative Extension (TCE) and Prairie View A&M University's Cooperative Extension Program (CEP). The population for both agencies included approximately 650 faculty members of which 332 met the criteria for the study. Only faculty that were

currently employed with TCE or CEP and had three years of data in the same county were included in the census. Any county faculty who had been hired or had moved since January 1, 2001, was excluded from the study to assure each included subject had a full three year report record in a single county. This three year report record provided the basis for the calculation of the dependent variable, program parity. A consolidated list of eligible faculty was established that included both Texas Cooperative Extension and Prairie View Cooperative Extension Program faculty included in the study.

This research design for this study was causal-comparative as recognized by Gall, Borg, and Gall (1996). Percent Hispanic participation in the subject's program, weighted based on potential Hispanic population in the county, was the variable used as a performance factor in this study and was named "program parity." This measured the level of Hispanic participation relative to the potential population in the county. Parity values were calculated by dividing percent program participation by the percent Hispanic population in the county. This "program parity" factor was used as the dependent variable for this study and was calculated for each subject in the population.

Data were collected through a survey instrument and through Human Resource departments at both Texas Cooperative Extension (TCE) and at the Prairie View Cooperative Extension Program (CEP). Other data were collected through publicly available web sources such as the U.S. Census Bureau (2002) and TCE monarch reporting system. For the data collected through the instrument, the Hardin-Brashears Bi-Modal method (Fraze et al. 2002) was employed to improve response rate.

Data were analyzed through the SPSS statistical analysis package, version 11.0. A total of 194 cases were considered. Using SPSS's option for scale measures, these cases were analyzed and yielded an alpha of .79. Reliability was consistent with the pilot test. Confidence levels were set at 95%, a priori. Control for non-response error on the survey was accomplished by a t-test of early and late respondents. No t values were found to be significant when equal variances were assumed and not assumed to be equal.

Data for respondents were categorized based on several characteristics. These categories represented multiple titles within each category. Agriculture and natural resources (ANR) agents included agriculture and natural resource, natural resources, horticulture, marine, and integrated pest management titles. These represented 113, or 53.1%, of all responses. Family and consumer science (FCS) agents represented family and consumer science and expanded nutrition program titles. These represented 73, or 34.3%, of all responses. The final two categories were 4H titles, representing 21 responses, or 9.9%, and other titles, representing 6 responses, or 2.8%.

Responses by ethnicity included White agents, representing 179 responses, or 84%. Hispanic agents responding to the survey numbered 16, or 7.5%, and Other agents numbered 18, or 8.5%. This final category of "other" agents included African-American, Asian, and other ethnic categories. A total of 56 respondents, or 26.3%, had a Bachelor's degree. One hundred fifty, or 70.4%, had a Master's degree. Finally, seven of the respondents, or 3.3%, had a doctoral level degree.

Texas Cooperative Extension (TCE) provided the greatest proportion of respondents with 197, or 92.5%. Respondent county faculty from the Prairie View Cooperative Extension Program (CEP) accounted for the remaining 7.5%. The TCE employees represent the Extension program established by the Morrill Act of 1862 (CSREES, 2004), while the CEP employees represent the Extension program established by the Second Morrill Act (CSREES, 2004), enacted in 1890 to serve through the historically black colleges and universities in the South.

For analysis purposes, respondents from counties with a population over 250,000 were identified as “urban” while the remaining respondents, representing counties with a population less than 250,000, were identified as “non-urban.” A total of 169 respondents, or 79.3%, came from non-urban counties while the remaining 44, or 20.7% were from urban areas. While the Hispanic population in Texas, estimated at 33.9% statewide in 2002, continues to grow at a rapid pace, the distribution of Hispanic population ranged from 1.7% in the northeast County of Cass to 97.4% in Starr County along the southern border of Texas (Census, 2002). The mean Hispanic population from respondent counties was 28.4%. It did not include all counties and counties with multiple respondents likely contributed in part to a mean that was 5.5% lower than the state average. Given that each county stood on its own demographics, this lower mean did not play a role in the overall study.

The dependent variable for this study was program parity and was calculated by dividing the percent Hispanics participation by the percent Hispanic population in the county of the responding agent. Table 2 shows a mean parity value of 66.87. The range of values for program parity was 2.85% to 409.39%. This range indicates that some county faculty were reaching 2.85% of the potential Hispanics in their county while others were reaching Hispanics in proportions that were four times higher than their share of their county population. The mean parity level was 66.9%, which was consistent with the 69.3% state average for the 2001-2003 reporting period. A similar parity value was calculated for committee membership. The range of committee parity values ranged from 0% to 500.8%.

Table 2. *Measures of central tendency and dispersion for program parity values*

	n	Mean	Median	Mode	SD	Range	Variance
Parity	213	66.87	60.45	2.85	49.86	406.54	2485.93

Findings

Measures of central tendency and dispersion for each of the demographic variables tested were collected and are shown in Table 3. With the exception of committee parity, total experience in years, and education, all variables were dummy coded to determine the presence or absence of the selected characteristic. Committee parity showed a mean of Hispanic participation that is just above 50% of the potential for the given county. Education showed a mean that approached a Masters Degree, which is

represented by a value of “5.” Experience was shown to be slightly more than 18 years with a range of more than 31 years of experience.

Correlations were conducted for the thirteen variables in addition to the dependent variable, program parity. The results of these correlations are in Table 3. The agriculture and natural resources (ANR) title category showed the highest correlation to the dependent variable at -.50. Following ANR in the descending strength of correlation to the dependent variable were gender (-.43), ethnic white (-.30), FCS (.29), 4-H (.29), non-urban (-.29), committee parity (.25), ethnic other (.22), ethnic Hispanic (.19), and 1862/1890 (.14). Those variables with a positive correlation with program parity included FCS, 4-H, committee parity, ethnic other, ethnic Hispanic, and employer (1890). Variables with a negative correlation with program parity included ANR, gender (male), ethnic white, and non-urban. Variables found to have no relationship with program parity included education, total experience, and titles other than ANR, FCS, and 4-H. These were mostly community development positions.

Table 3. *Relationship Between Program Parity and Selected Variables (n=213)*

Variables	%	<u>M</u>	<u>SD</u>	R	<u>p</u>
Program Parity		66.87	49.86	1.00	
Committee Parity		56.04	62.56	.25*	<.01
County Population		0.79	.41	-.29**	<.01
Non-Urban	78.8 %				
Urban	21.2 %				
Education		4.77	.49	-.09*	.21
Bachelors	26.3%				
Master	70.4%				
Doctorate	3.3%				
Years Extension Experience		18.11	8.92	-.08*	.28
Gender				-.43**	<.01
Male	56.0%				
Female	44.0%				
Employer				.14**	.04
1862 (TCE)	91.8%				
1890 (CEP)	8.2%				
Ethnic White		.84	.37	-.30**	<.01
Ethnic Hispanic		.08	.26	.19**	.01
Ethnic Other		.08	.28	.22**	<.01
Title – ANR		.53	.50	-.50**	<.01
Title – FCS		.34	.48	.29**	<.01
Title – 4-H		.10	.30	.29**	<.01
Title – Other		.03	.17	.13**	.06

* Pearson Product Moment; ** Point Bi-serial

To address objective 2, multiple regression was performed. Variables were examined for evidence of multicollinearity. Those variables correlated to each other at a level of 0.60 or higher were assumed to be collinear. Where confidence levels were met,

correlations between variables ranged from a low of .15 to a high of .81. There was a very strong correlation (.81) between gender and title categories for agriculture and natural resources (ANR) and family and consumer science (FCS). As a result, gender was dropped as a variable insofar as it was significant only to the extent that it was correlated to those two title categories. In addition there was a very strong correlation (-.77) between FCS and ANR titles. Because the ANR title showed a stronger correlation to the dependent variable, it was retained as a variable and the FCS variable was dropped. Finally, there were strong correlations among ethnic groups. The White variable was correlated to both Hispanics (-.65) and Others (-.70). There was no correlation between Hispanics and Others. Following the same protocol as prior variables, the variable(s) with the strongest correlation to the dependent variable, ethnic White (-.30) was retained and the other two ethnic variables (.22 & .19) were dropped from the model.

A total of six demographic variables were retained from the original thirteen variables tested for correlation. Those demographic variables remaining, in descending order based on the strength of their correlation to parity, were ANR (-.50), ethnic white (-.30), 4-H (.29), non-urban (-.29), committee parity (.25), and employer (.14).

The six demographic variables retained were entered into a regression equation using the forced entry method. Variables were entered in descending order according to the strength of their correlation with the dependent variable. As such, ANR was entered into the model first and followed by ethnic White, 4-H, non-urban, committee parity, and employer (1862/1890) variables. The results of the model are shown in Table 4. This model explained 35% of the variance ($R^2=.35$) and produced an F value of 18.18. Four of the six predictors in this model met confidence levels set at .05 a priori. They included ANR, 4-H, non-urban, and committee parity variables. The ethnic white variable was slightly over the confidence level at .06 and the 1862/1890 variable showed a p value of .52, considerably higher than confidence limits set. From these p-values, predictions of parity may be made based on those four predictors that showed statistical significance in the model.

The B value for the constant in the model, 110.61, represents the y-intercept value from which predictors can be used to predict parity values. The value of the constant is calculated based on the inclusion of all variables except for those held independent in this model. When ANR titles are introduced into the model, the predicted effect on parity is a decrease of 36.36 points, reducing parity from 110.36 to 74.25. The next predictor, 4H, predicts an increase of 20.02 points in parity that results in a predicted parity value of 130.62. When non-urban counties are introduced into the model, parity is predicted to decrease by 23.08 points to 87.53. The last predictor that met confidence levels was committee parity and unlike the other demographic variables, was measured at the interval level. As a result, its B value is considerably different from the others at .10. Because the other variables were dichotomously coded, the only predicted effects on parity are based on the inclusion or exclusion from the model. Unlike those variables, committee parity predicts a .10 increase in program parity for every unit increase in committee parity. If an increase of 1 point in program parity were desired, it would require a 10 point increase in committee parity.

Table 4. *Regression Coefficients for Demographic Variables (n=213)*

	B	SE	Beta	t	p
Constant	110.61	9.89		11.19	.00
ANR	-36.36	6.53	-.37	-5.57	<.01**
Ethnic White	-17.09	8.84	-.13	-1.93	.06
4-H	20.02	10.28	.12	1.95	.05*
Non-urban	-23.08	7.40	-.19	-3.12	<.01**
Committee Parity	.10	.05	.13	2.10	.04*
1862/1890?	7.49	11.49	.04	.65	.52

* significant at .05 level; ** significant at the .01 level

R²=.35; F=18.18

dependent variable: program parity

Conclusions

The following summary of conclusions was made based on the findings of this study.

1. It was concluded that the level of Hispanic participation in program development committees is a strategy that can lead to higher levels of Hispanic participation in programs.
2. The variables ANR, ethnic White, 4-H, non-urban, committee parity, and employer (1862 vs. 1890) are good predictors of Hispanic participation and account for more than 1/3 of the characteristics that explain the level of Hispanic participation in Texas Extension programs.
3. Gender is correlated to the level of Hispanic participation only to the extent that it is correlated to ANR and FCS titles.
4. Expanding urban programs could lead to higher levels of Hispanic participation. It was also concluded that there are likely characteristics about large, urban county programs that promote higher levels of Hispanic participation and characteristics about smaller, rural counties that lead to lower levels of Hispanic participation.
5. The relationship between TCE and CEP is one that significantly helps TCE improve its levels of Hispanic participation.
6. Ethnic White agents have a negative effect on Hispanic participation levels while minority agents, regardless of ethnicity, have a positive effect on Hispanic participation.

Recommendations

As a result of conclusions drawn from this study, the following recommendations have been made.

1. Increase the number of ethnic minority county faculty, specialists, supervisors, and state administrators (a goal of 25% would be 75% parity at 2002 population estimates)
2. Appoint minority mentors for newly hired minority faculty
3. Preserve and improve the TCE/CEP relationship and develop voluntary and involuntary opportunities for meaningful joint program development, delivery, and evaluation along with meaningful joint training and education.
4. Improve the current program planning system such that it sets goals related to inclusion and diversity in program plans. Plans should include goals, activities, and evaluation strategies for minority participation in program development committees, programs, and activities. It should also include research-based action strategies for which agents assume responsibility. These strategies should address and overcome barriers and lead to improved Hispanic participation in programs and not be limited to the documentation of “all reasonable efforts” as cited in the Civil Rights Act of 1964 (USDOJ, 2004).
5. Given that ANR agents represented the single strongest variable that had a negative relationship with Hispanic parity levels, it is recommended that a group of stakeholders in that program examine it and develop research-based strategies that would lead to increased levels of Hispanic participation. These strategies might include:
 - ❖ a state Hispanic/minority agriculture advisory committee that would provide guidance and support for the development of state programs for minority stakeholders in agriculture including but not limited to minority farmers and ranchers,
 - ❖ develop a structured urban agriculture initiative that develops, pilots, and supports sustained, research-based food and fiber programs that address urban issues.

References

- Cano, J. & Bankston, J. (1992). Factors which influence participation and non-participation of ethnic minority youth in Ohio 4-H programs. *Journal of Agricultural Education*, 33,1. Retrieved August 30, 2004 from <http://pubs.aged.tamu.edu/jae/ppdf/vol33/33-01-23.pdf>
- Cooperative State Research, Extension, and Education Service (CSREES). (2004). *Smith-Lever Act*. Retrieved June 15, 2004 from <http://www.csrees.usda.gov/about/offices/legis/SMITHLEV.PDF>
- Gall, M.D, Borg, W.R., & Gall, J.P. (1996). *Educational Research*. (6th Ed.). White Plains, N.Y.: Longman Publishers.
- Fraze, S., Hardin, K., Brashears, T., Haygood, J. & Smith, J.H. (2002). The effects of delivery mode upon survey response rate and perceived attitudes of Texas AgriScience teachers. Paper presented at National Agricultural Education Research Conference, Las Vegas, NV.
- Gillespie, J. I. (1996). *Una Vida Mejor: Summary of identified needs assessment studies in the Texas Hispanic community 1990-1996: A resource for educators*. Texas Agricultural Extension Service, The Texas A&M University System.
- Grossman, H. (1984). *Educating Hispanic Students*. Springfield, Ill: Charles C. Thomas.
- Harman, D. (Ed.). (1976). *New direction for higher education: Expanding recurrent and nonformal education*. San Francisco: Jossey-Bass.
- Jones, B. M. (1992). Addressing Societal Issues. *Journal of Extension*, 30, 4. Retrieved October 6, 2001 from <http://www.joe.org/joe/1992winter/tp1.html>
- Knowles, M. S., Holton, E. F., & Swanson, R. A. (1998). *The adult learner*. Houston: Gulf Publishing.
- Murdock, Steve, et.al. (1997). *The Texas Challenge*.(1st ed.). College Station: Texas A&M University Press.
- Reyes, P., Scribner, J. D., & Scribner, A. P. (Eds.) (1999). *Lessons from high performing Hispanic schools*. New York: Teachers College Press.
- Texas Cooperative Extension. (2003). Texas Extension Planning/Reporting 2000+ [Data file]. Available from Texas Cooperative Extension Monarch Web site, <http://monarch.tamu.edu/~reports>

U.S. Census Bureau (2002). American Community Survey Profile 2002. Retrieved January 3, 2004 from <http://www.census.gov/acs/www/Products/Profiles/Single/2002/ACS/Tabular/040/04000US481.htm>

Warrix, M.B. & Bocanegra, M. (1998, December). Keys to Building Successful Training Programs for Hispanic Family Day Care Providers. *Journal of Extension*. 36,6. Retrieved on August 30, 2003 from <http://www.joe.org/joe/1998december/a4.html>.