© Journal of Agricultural Education
Volume 53, Number 3, pp 71–83
DOI: 10.5032/jae.2012.03071

Developing an Instrument to Examine Master Gardeners' Participation Motives

Robert Strong, Assistant Professor
Texas A&M University
Amy Harder, Associate Professor
University of Florida

Nonformal education is learner–centered and provides knowledge in a practical manner to participants. Master Gardener is a nonformal extension horticultural program that includes extensive requirements to earn certification. The purpose of this study was to examine the Mergener Education Participation Scale (M–EPS) to evaluate adult motivations to participate in the Florida Master Gardener program. Participants were selected using stratified random sampling and the Tailored Design Method was employed for data collection with a mail survey. The response rate was 86.79% (N = 530). Through principal component analysis, the reliabilities of the new factors were higher than the reliabilities of the factors associated with the M–EPS. Reliabilities of the new factors were: Other's Perceptions .93, Vary Routine .91, Community Service .90, Socialization .87, Learning .84, and Professional Enhancement .82. Researchers should employ the constructs identified by this study to assess adult motives to participate in other Florida Master Gardener programs.

Keywords: Master Gardeners, adult motivation, nonformal education, Education Participation Scale

Introduction

The social objectives of education are oriented toward the formation and preservation of a sustainable future (Shohel & Howes, 2010). Tough (1979) said adults are intuitively self–directed learners. Self–directed learners plan, complete, and assess their personal learning experience (Merriam, Baumgartner, & Cafferalla, 2007). Knowles, Holton III, and Swanson (2005) indicated adults have more direction, authority, and responsibility for their learning than youth. Adult learning can be enhanced when researchers and practitioners develop an understanding of the reasons that adults participate in the educational program (Merriam et al., 2007). Knowing why adults participate is beneficial for practitioners in order to develop and deliver programs that relate to adult needs (Merriam & Brockett, 2007).

Many researchers have identified a need to determine why adults participate in nonformal education (Clemons & Vogt, 2004; Kirby, Curran, & Hollett, 2009; Rabušicová & Rabušic, 2006; Yan–Fung & Tsz–Man, 1999). According to Etling (1993), nonformal education is learner–centered, and focuses on practical skills, knowledge, and application. Nonformal education is organized as instructional programs found in community associations, cultural institutions, and voluntary organizations (Merriam et al., 2007). Sixty percent of nonformal education and training is provided by nonformal educational institutions and employers (Boateng, 2009). Kuenzi (2005) indicated nonformal education plays a significant role in the progress of developing countries. Very little substantive research has been conducted on nonformal education participation in the United States (Chen, Kim, Moon, & Merriam, 2008; Taylor, 2006). Despite the prevalence of nonformal education, it is a challenge to evaluate participation in nonformal educational programs (Merriam et al., 2007), which may account for the lack of published research. According to Taylor (2006), "The lack of understanding about nonformal education in the literature is problematic considering the overwhelming presence of this form of local education and the dearth of

information about its unique educational context and practice" (p. 293).

One of the largest nonformal programs in Florida is the Master Gardener program delivered by UF/IFAS Extension. Adults undergo extensive procedures in order to earn certification as a Florida Master Gardener. In Florida, adults participate in a twelve week course to achieve Master Gardener certification. The cost of the twelve week course is approximately $100 for participants. After earning certified status, adults are required to donate a minimum of 75 volunteer hours back to the Master Gardener program. Adults meet this requirement by teaching horticultural information learned from the program to citizens in local communities. In 2010, there were approximately 4,100 adult Master Gardeners in Florida who taught over 64,000 adults (E. Eubanks, personal communication, January 14, 2011).

This study was conducted to address Priority 4 of the *National Research Agenda* of agricultural education's (Doerfert, 2011) recommendation that research is needed to determine if agricultural education programs provide life and career readiness for adults. When adult education practitioners understand adult motives to participate in educational programs, information can be delivered to meet participant needs, increase the likelihood adults learn information, and foster continued participation in the program (Merriam et al., 2007). The interim Director of Florida Extension said the total value of Florida Master Gardener volunteer hours in 2010 were worth approximately $8,800,000 to Florida Extension (M. Ferrer–Chancy, personal communication, July 26, 2011). Strong and Harder (2010) suggested the significance of Master Gardeners to Cooperative Extension underscores the importance to understand factors that influence adult participation in the Master Gardener program. This study sought to understand adult's motivation to participate in agricultural extension programs in order to inform academics and practitioners within the broader field of agricultural education.

Theoretical Framework

Houle's (1961) Typology consists of learning classifications that explain adult motives to participate in educational programs. Houle identified the learning, activity, and goal orientations to explain adult motivations in participating in continued learning experiences. Adults may participate for a variety of reasons but understanding the differences is what adult educators should know (Houle, 1961). Boshier and Collins (1985) confirmed Houle's learning classification findings on a study of participation motives with approximately 13,000 adults from Africa, Asia, Canada, New Zealand and the United States.

Learning–oriented adults participate in educational programs in order to learn new information (Houle, 1961). Adults in the learning classification believe participating in educational programs is a method to enhance their personal lifestyle. Activity–oriented adults get involved in educational programs in order to meet new people and increase their social circles. Houle said adults in the activity classification need opportunities for self–reflection due to individual needs are too broad or remedial. Goal–oriented adults participate in educational programs primarily to accomplish specific objectives in their personal or professional life (Houle, 1961). The objectives adults desire to achieve can be either voluntary on their part or mandated by a business or agency.

Educational programs attract adults for a variety of reasons but each individual participates for his/her own personal aspiration (Houle, 1961). Adult educators should be able to discern the differences in each motivational orientation in order to best meet the educational needs of participants. Houle said the one trait that all adult students have in common is they are perpetual learners. When educators understand the various motivations of adults, then the journey to teaching and learning will begin (Houle, 1961).

Although Houle's (1961) Typology is fifty years old, the theory continues to have relevance for adult education research. Kim and Merriam (2004) indicated Houle's Typology mapped the course for future research on adult participation in educational programs. Houle's theory has been used by a variety of social science researchers to examine adult participation motives. Norton (2007) used Houle's Typology as the theoretical framework to survey the motivations of government officials to

participate in an emergency management program, and found adults were goal–oriented. Houle's Typology served as the theoretical framework in a study identifying social workers as goal–oriented learners motivated to participate in continuing education (Dia, Smith, Cohen–Callow, & Bliss, 2005). Tassone and Heck (1997) employed Houle's Typology to frame a study and found allied health professionals participated in an educational program due to their learning–orientation. Van Den Berg, Dann, and Dirkx (2009) utilized Houle's Typology to identify learning and activity–orientations motivated adults to participate in a nonformal conservation education program. Sundet and Galbraith (1991) said Houle's Typology is a useful theory for studying multiple participant motives in adult learning programs.

Mergener (1979) constructed the Mergener–Education Participation Scale (M–EPS) consisting of 43 items from Houle's (1961) adult learning orientation typology. Mergener said the M–EPS was constructed of six factors explaining adult orientations to learning: Competency–related Curiosity (CRC), Interpersonal Relations (IR), Community Service (CS), Escape from Routine (ER), Professional Advancement (PA), and Compliance with External Influence (CEI). Competency–related Curiosity and Community Service related to Houle's learning–oriented classification, the Interpersonal Relations and Escape from Routine factors related to Houle's activity–oriented group, and Professional Advancement and Compliance with External Influence factors related to Houle's goal–oriented classification.

Purpose and Objectives

The purpose of this study was to examine an instrument to evaluate adult motivations to participate in the Florida Master Gardener program. Specifically, the objectives were to:

1. Examine the reliability of Mergener's (1979) Education Participation Scale for measuring participants' motivational orientations in the Florida Master Gardener program and;
2. Test the unidimensionality of Mergener's (1979) Education Participation Scale when used to measure adults' motivational orientations to participate in Florida Master Gardener.

Methodology

Florida Master Gardeners were the target population for this study. There were 3,822 Master Gardeners in Florida at the time of this study. According to Cochran (1977), a sample size of 362 usable surveys was required for a confidence interval of +/– 5 when N = 3,822. Response rates reported in recent literature are utilized to determine the potential response rate for future research involving a mail survey with a similar population (Bartlett, Kotrlik, & Higgins, 2001). For mail surveys, 5 to 10 % should be added to the total sample size in order to account for incorrect participant mailing addresses, participants who may have recently passed away, and for questionnaires with incomplete participant responses (Babbie, 2007). The response rate was anticipated to be between 62 and 68% due to response rates in previous research utilizing a mail survey with Master Gardeners (Schott, 2001; Schrock, 1999; Sutton, 2006). The sample size was 613 Master Gardener participants (362 usable surveys ÷ 65% average response rate × 10% = a sample size of 613).

A geographical stratified sampling method was employed for this study. Agresti and Finlay (2009) indicated stratified random sampling separates the population into distinct groups, and then a simple random sample is chosen from each group. Florida Cooperative Extension is divided into five distinct districts: Northwest, Northeast, Central, South Central, and South. The sum of Master Gardeners in the five Extension districts (stratum) was N = 3,822. Proportional sample allocation was utilized as the sampling technique to select the samples. The sample size in each stratum (district) was selected in proportion to the size of the stratum. The samples were:

1. Sample size in Northwest district = (586/3,822) 613 = 94
2. Sample size in Northeast district = (521/3,822) 613 = 84
3. Sample size in Central district = (1,209/3,822) 613 = 194

4. Sample size in South Central district = (876/3,822) 613 = 140
5. Sample size in South district = (630/3,822) 613 = 101

A total of 613 Master Gardeners were randomly selected for this study. A list of the Master Gardeners in each county selected to address the respective district stratum was provided by the Master Gardener coordinator in that county. Counties were purposively selected within each district according to the number of Master Gardeners in that county and the stratum needed in that corresponding district in order for the study to be representative of the total population. The counties in each district were reviewed for their total number of Master Gardener participants. Counties with the total number of Master Gardeners needed to fit the district stratum where included and remaining counties were excluded from the study. Respondents were selected with the use of random number generator in Excel 2007.

The larger study utilized a questionnaire with three sections. For the purposes of this paper, the section of interest was Mergener's (1979) Education Participation Scale. Mergener (1979) indicated the M–EPS consisted of 43 items encompassing five separate constructs: Competency–related Curiosity, Interpersonal Relations, Community Service, Escape from Routine, Professional Advancement, and Compliance with External Influence. Variables on M–EPS were measured on a five–point scale: 1 = *very much influence*, 2 = *much influence*, 3 = *moderate influence*, 4 = *little influence*, 5 = *very little influence* (Mergener, 1979).

The questionnaire was printed as an 8.5" x 11" booklet and mailed to the sampled population. The Tailored Design Method, as outlined by Dillman, Smyth, and Christian (2009), was implemented to increase response rates when utilizing a mail survey. Dillman, et al. contact sequence outlines methods to increase response rate from participants. In this study, the first contact included subjects receiving a prenotice letter from the researchers detailing their involvement in the study was voluntarily and valuable. The second contact was the mailed questionnaire sent three days later that included a cover letter describing why the response was important. The third contact was a thank you postcard that was sent to the subject one week after the questionnaire (Dillman et al., 2009). The fourth contact included a replacement questionnaire for the nonrespondents two weeks after the initial questionnaire mailing (Dillman et al., 2009). Five hundred thirty–two responses (86.79%) were received. Two responses were pulled from the study for inadequate information and thus, 530 were usable. The results can be generalized to Florida Master Gardeners because early and late respondents were compared, and no significant difference existed (Lindner, Murphy, & Briers, 2001).

The study's first objective was to examine the reliability of Mergener's (1979) Education Participation Scale for measuring participants' motivational orientations in the Florida Master Gardener program. Reliability is the consistency of a social sciences instrument (Agresti & Finlay, 2009). Ary et al. (2006) said "internal consistency determines whether all items in the instrument are measuring the same thing" (p. 261). Cronbach's alpha is the most widely used measure of reliability on attitude scales (Agresti & Finlay, 2009). Mergener (1979) reported a reliability of .90 for the M–EPS.

The second objective sought to test the unidimensionality of Mergener's (1979) Education Participation Scale when used to measure adults' motivational orientations to participate in Florida Master Gardener. The M–EPS had not been previously used to discover what motivates adults to participate in Master Gardener or other nonformal educational programs. The researchers utilized the M–EPS due to the instrument's derived association with Houle's (1961) Typology and the academic and practical need to develop an understanding of adult motives to participate in Florida Master Gardener.

Principal component analysis (PCA) with orthogonal varimax rotation and the Kaiser criterion was utilized to test the unidimensionality of the M–EPS. Agresti and Finlay (2009) identified PCA as an approach to identify patterns in data in order to emphasize similarities and differences in the dataset. Costello and Osborne (2005) said orthogonal varimax rotation is the most commonly used extraction method to refine a study's data structure into factor loadings. The loading of a variable on a factor is referred to as the correlation of the variable with the factor

(Agresti & Finlay, 2009). Factor loadings range from .40 (low) to .70 (moderate) in social science research (Costello & Osborne, 2005). The Kaiser criterion produces all items with eigenvalues greater than one (Costello & Osborne, 2005).

Findings

The study's first objective was to examine the reliability of Mergener's (1979) Education Participation Scale on participants' motivational orientations in the Florida Master Gardener program. The internal consistency of items in a scale is measured by Cronbach's alpha coefficients (Cronbach, 1951). These coefficients are utilized to indicate each item's reliability (Ary et al., 2006). The reliability of the M–EPS was calculated *ex post facto* at .83. Reliability levels for each of the factors in the M–EPS were calculated *ex post facto* (see Table 1). Professional Advancement .70, Competence related Curiousity .76, Interpersonal Relations .77, and External Influence had unacceptable reliability levels.

Table 1
*Reliability Levels of Factors in the Mergener's (1979) Education Participation Scale (*N = *530)*

Internal Scale	α Levels
Professional Advancement	.70
Escape from Routine	.81
Competence related Curiosity	.76
Community Service	.84
Interpersonal Relations	.77
External Influence	.79

Note. Reliability levels ≥ .80 were considered acceptable (Cronbach, 1951).

The study's second objective was to test the unidimensionality of Mergener's (1979) Education Participation Scale when used to measure adults' motivational orientations to participate in Florida Master Gardener. Initially, the factorability of the 41 M–EPS items was examined. Responses to the 41 items on the M–EPS were factor analyzed by the method of principal component analysis and then rotated to achieve orthogonal and oblique structure according to the varimax criteria of Babbie (2007). Factor loadings of .43 or more were considered acceptable (see Table 2).

In this study, certain items loaded on separate factors than Mergener (1979) reported in the M–EPS. To account for the new and altered factors, the new factors were labeled with different names. Competence related Curiosity became *Learning*, Interpersonal Relations became *Socialization*, Escape from Routine became *Vary Routine*, and Professional Development and External Influence were combined to form *Professional Enhancement*. Community Service remained Community Service. A new factor, called Other's Perceptions, was formed.

Six items were dropped from the analysis due to the inability of forming the items into two separate factors. The items removed were *To Comply with Recommendations from Someone Else*, *To Keep Up with Others*, *To Supplement a Previous Narrow Education*, *To Clarify What I Want to Be Doing 5 Years from Now*, *To Overcome the Frustrations of Day to Day Gardening*, and *To Acquire Knowledge that Will Help with Other Courses*.

Six items loaded on the Learning factor and items ranged from .82 to .45 (see Table 2). Five items loaded on the Community Service factor ranging from .78 to .43 and five items loaded on the Socialization factor ranging from .76 to .56. Seven items loaded on the Vary Routine factor and items ranged from .79 to .50. Eight items loaded on the Professional Enhancement factor and items ranged from .80 to .45. Four items loaded on the Other's Perceptions factor and items ranged from .65 to .51. Items loading on two separate factors ranged from .66 to .42.

Factor names were revised due to items loaded onto different factors or items loading on new separate factors. Items from Professional Development and External Influence loaded

onto a single factor named Professional Enhancement. A new factor named Other's Perceptions was established to discern the four items that loaded onto the factor. Adults participated in the Florida Master Gardener program to learn, enhance their community, to socialize, to vary their routine, acquire professional enhancement, and to address other's perceptions of them.

Table 2
Partition of Variance among Factors in the M–EPS (N = 530)

Factors	*Factor Loadings*
Learning (Competence related Curiosity)	
To Feed an Appetite for Knowledge	.82
To Satisfy an Inquiring Mind	.81
To Satisfy Intellectual Curiosity	.75
To Seek Knowledge for its Own Sake	.64
To Obtain Practical Benefit	.46
To Respond to the Fact that I am Surrounded by People Who Continue to Learn	.45
Community Service	
To Improve My Ability to Serve Mankind	.78
To Prepare for Community Service	.76
To Be a More Effective Citizen	.74
To Improve My Community Work	.70
To Comply with the Ethics of the Horticulture Industry	.43
Socialization (Interpersonal Relations)	
To Participate in Group Activities	.76
To Become Acquainted with Congenial People	.74
To Share a Common Interest with Someone Else	.69
To Fulfill a Need for Personal Associations	.66
To Improve Social Relationships	.56
Vary Routine (Escape from Routine)	
To Get a Break from Routine of Home or Work	.79
To Gain Relief from Boredom	.70
To Provide a Contrast to the Rest of My Life	.66
To Have a Few Hours Away from Responsibilities	.62
To Stop Myself from Becoming Stagnant	.55
To Provide Contrast to My Previous Education	.51
To Escape the Intellectual Narrowness of My Occupation	.50
Professional Enhancement (Professional Development & External Influence)	
To Give Me Higher Status on the Job	.80
To Secure Professional Advancement	.78
To Fulfill My Professional Obligation	.69
To Fulfill Requirements of a Government Agency	.64
To Help Me Earn a Degree, Diploma or Certificate	.62
To Maintain or Improve My Social Position	.61
To Carry Out the Recommendations from Some Authority	.58
To Comply with My Employer's Policy	.45

Other's Perceptions	
To Comply with the Fact that People with Status and Prestige Attend Adult Education Classes	.65
To Take Part in an Activity which is Customary in the Circles in which I Move	.59
To Be Accepted by Others	.57
To Gain Insight into Human Relationships	.51
Items Loaded into a Separate Construct	
To Comply with Recommendations from Someone Else	.66
To Keep Up with Others	.60
To Supplement a Previous Narrow Education	.54
Items Loaded into a Separate Construct	
To Clarify What I Want to Be Doing 5 Years from Now	.58
To Overcome the Frustrations of Day to Day Gardening	.51
To Acquire Knowledge that Will Help with Other Courses	.42

Note. Factors with a loading of .43 were considered acceptable (Babbie, 2007).

Conclusions

The first objective of the study was to examine the reliability of Mergener's (1979) Education Participation Scale on participant's motivational orientations in the Florida Master Gardener program. In this study, Cronbach's (1951) alpha of the M–EPS was .83. The M–EPS is a reliable instrument in assessing adult motivations for participating in Master Gardener programs. However, Professional Advancement, Competence related Curiosity, Interpersonal Relations, and External Influence had suspect reliability levels according to Cronbach (1951).

The study's second objective was to test the unidimensionality of Mergener's (1979) Education Participation Scale on adults' motivational orientations for participating in the Florida Master Gardener program. The researchers employed factor loadings produced by principal component analysis to examine the M–EPS. Previous items associated with factors identified by Mergener, loaded on separate factors in this study. The conclusion is that the factors for the M–EPS are not applicable when used with Florida Master Gardeners.

The reliabilities of the new factors were higher than the reliabilities of the factors associated with the M–EPS. Reliabilities of the new factors were: Other's Perceptions .93, Vary Routine .91, Community Service .90, Socialization .87, Learning .84, and Professional Advancement .82. The reliability of the updated instrument was calculated *ex post facto* at .91. This indicates the revised instrument had a higher reliability .91 than the M–EPS .83 when utilized with the Florida Master Gardener population even though both instruments are considered acceptable according to Cronbach (1951).

A conceptual framework represents factor loadings of factors on Mergener's (1979) Education Participation Scale related to Houle's (1961) Typology for formal adult education programs and loadings of factors on new instrument for the Florida Master Gardener nonformal adult educational program to further explain Houle's Typology (see Figure 1). Learning, Community Service, Socialization, Vary Routine, Professional Enhancement, and Other's Perceptions were the new factors produced to further explain Houle's Typology on motivational orientations of adults participating in nonformal educational programs. Unrelated items loading on the two separate factors were eliminated from the framework.

Understanding the factors that were realigned with Houle's (1961) three learning classifications from Mergener's (1979) M–EPS due to principal component analysis, is the value of the conceptual framework to our profession. The population in this study was Florida Master Gardeners, and thus, offer insight as to what motivates volunteers to participate in the Florida Master Gardener program versus pharmacists participating in a mandated continuing education program. The conceptual framework will offer future researchers examining Master Gardener participation and other types of adult participation in agricultural education programs

an illustration and foundation of how factors align with Houle's Typology.

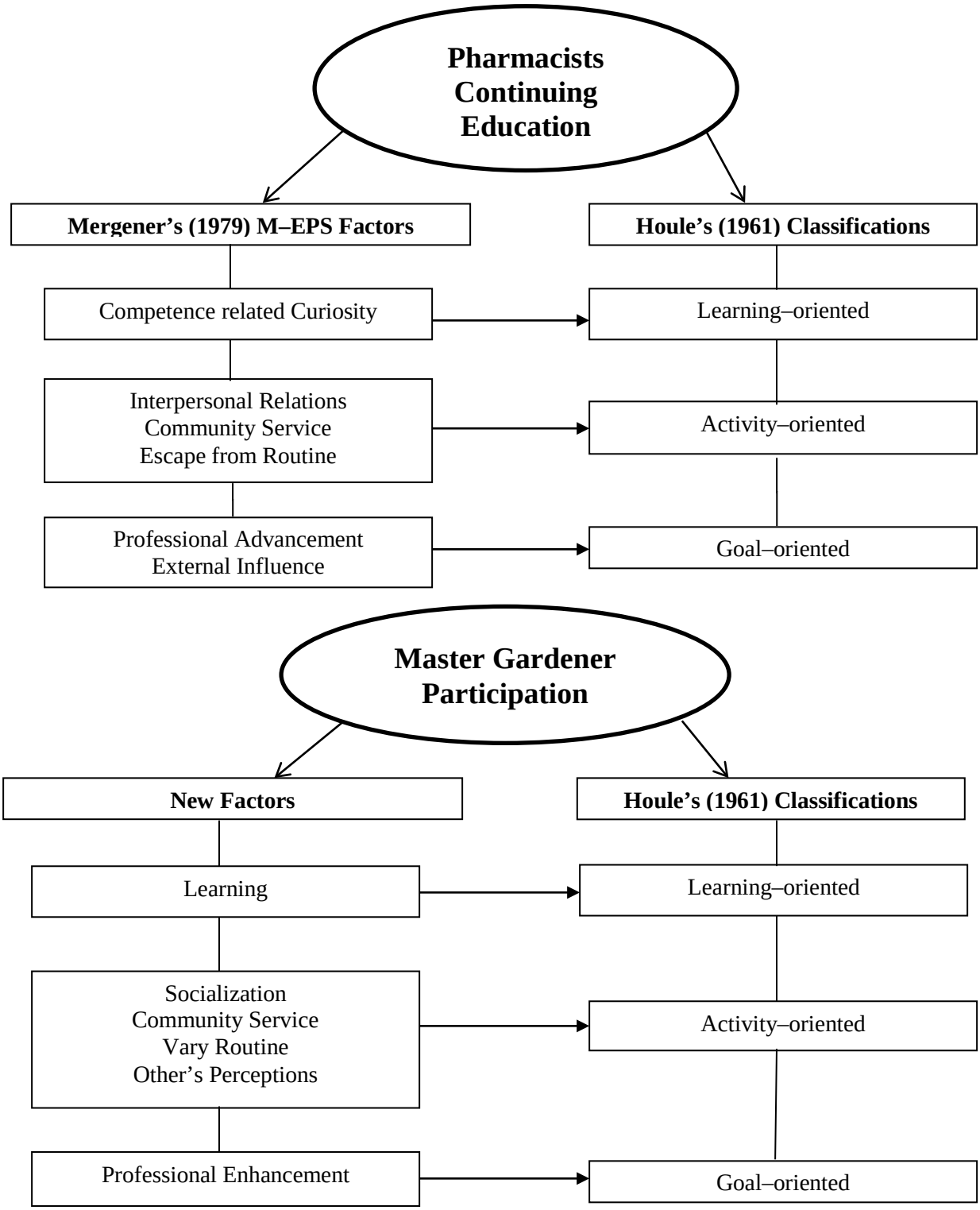

Figure 1. A conceptual framework of M–EPS Constructs Realigned from Principal Component Analysis Resulting in an Updated Instrument to Further Explain Houle's (1961) Typology

Implications

Houle (1961) said adults participate in continued learning for a variety for reasons. Mergener (1979) designed the M–EPS with constructs based upon Houle's learning classifications Typology. The constructs produced from testing the unidimensionality of the M–EPS in this study serve to further knowledge on Houle's original findings as well by producing the constructs identified by this study.

The constructs identified by this study fit Houle's (1961) Typology. Developing a comprehension of the constructs for adult motivations will aid Master Gardener practitioners in planning, implementing, and evaluating adult's learning experience (Merriam et al., 2007). When practitioners know why adults participate in nonformal educational programs, content can be developed and delivered that connect to adult needs and improve the likelihood adults will learn and remain in the program (Merriam & Brockett, 2007).

The modified Learning construct related to Houle's (1961) learning–oriented classification. Adults in the learning–oriented classification have a robust aspiration to learn and discern learning as a responsibility for a member of society (Houle, 1961). This information should inform Master Gardener practitioners that adults in this classification may be devoted to learning and participate in the Master Gardener program due to their constant quest of learning (Houle, 1961). Practitioners should provide adult participants in the learning classification extensive opportunities to learn new information in order meet his/her needs.

The modified constructs of Socialization, Community Service, Vary Routine and Other's Perceptions from the constructs identified by this study related to Houle's (1961) activity–oriented classification. These findings should assist practitioners in developing an understanding of adults in this classification participates in Master Gardener for diverse reasons associated with social contact (Houle, 1961). Activity–oriented adults mainly participate in educational programs to broaden their social network (Houle, 1961). Practitioners should offer adults opportunities to work in groups as participants and throughout communities when teaching horticultural lessons in order to provide experiences to socialize with one another and clientele.

The modified construct of Professional Enhancement relates to Houle's (1961) goal–oriented classification. These results should inform Master Gardener coordinators that adults in this classification would participate in Master Gardener in order to meet a professional objective or a goal someone has recommended to accomplish (Houle, 1961). Practitioners should provide adults in the goal–oriented classification opportunities to achieve vocational objectives during his/her Master Gardener tenure. Adults are more apt to participate when their needs are met (Houle, 1961).

The differences in adults are the focal point of Houle's (1961) Typology. The constructs identified by this study can be utilized to assess adult motivations to participate in other Florida Master Gardener programs. In this study, the factors may have loaded differently due to dissimilar populations. Mergener's (1979) study included pharmacy students participating in a continued learning experience mandated by the profession. Adults participating in Master Gardener as volunteer educators may have caused items to load on separate constructs in this study.

The disparity in factor loadings may not have solely been due to the population but could include the type of educational program. The difference of factor loadings could be explained by adults participating in mandated formal educational programs versus adults volunteering in a nonformal educational program. Merriam et al. (2007) said it is a challenging to evaluate participation in nonformal educational programs. This study identified constructs that can be used to evaluate adult participation in nonformal educational programs. The results from this study alleviated some of the research deficiency, identified by Chen et al. (2008) and Taylor (2006), on participation in nonformal education.

Recommendations

The inclusion of the constructs may provide researchers and practitioners more insight on adult motivations in Master Gardener. Researchers should utilize the constructs

identified in this study to examine Master Gardener's motivational orientations for Master Gardener participation. The constructs identified by this study should be tested further in order to ascertain if identical items load on similar constructs as this study.

Master Gardener participants should not be the only population researched with the constructs identified by this study. Diverse adult nonformal education populations should be studied with the constructs identified by this study due to the potential of gaining insight on adult motivations for participating in nonformal educational programs. There are other examples of 'Master' nonformal education programs offered by Extension: Master Equine Manager, Master Naturalist, Master Goat and Sheep Producer, Master Logger, Master Beef Producer, etc. The constructs identified by this study could be utilized to research adult motivations to participate in those nonformal educational programs. The findings should be shared with agricultural education academics and extension practitioners to potentially expand the knowledge base of extension education.

Adults participate in a variety of nonformal agricultural leadership educational programs. Researchers could employ the constructs identified by this study to assess adult motives in those programs and report the findings to the agricultural education discipline. This information may assist agricultural leadership faculty, coordinators of statewide agricultural leadership programs and educators of agricultural leadership programs on local levels insights on adult motivations to participate in continued agricultural leadership learning experiences. This information could broaden the view of agricultural education as an academic discipline.

The factors identified by this study provided insight on motivational orientations of adults participating in Florida Master Gardener. Given the time and resource adults provide the Florida Master Gardener program, an essential need exists for local Master Gardener coordinators to learn adults' motivations for participating in the program. According to Merriam et al. (2007), adults will continue their participation and are more apt to learn more information when adult educators learn what motivates adults to participate in the educational program and strive to ensure the educational program is addressing adult needs. Teaching Florida Master Gardener coordinators the motivational factors identified in this study could be accomplished face–to–face trainings or through distance education delivery tools. The Florida Master Gardener program is a voluntary educational program where participants disseminate information from the land–grant institution to citizens across the state. Master Gardener coordinators should work to meet the needs of this volunteer workforce regardless if adults are learning, activity or goal–oriented. Houle (1961) said adults will continue their participation when their needs are addressed. Continuing to conduct research with Master Gardeners will help extension agents develop an understanding of volunteer needs and how to best retain and utilize Master Gardeners to educate the public and meet Extension objectives.

References

Agresti, A., & Finlay, B. (2009). *Statistical methods for the social sciences* (4th ed.). Upper Saddle River, NJ: Prentice Hall.

Ary, D., Jacobs, L. C., Razavieh, A., & Sorenson, C. (2006). *Introduction to research in education* (7th ed.). Orlando, FL: Harcourt Brace & Company.

Babbie, E. (2007). *Survey research methods* (11th ed.). Belmont, CA: Wadsworth.

Bartlett, J. E., II, Kotrlik, J. W., & Higgins, C. C. (2001). Organizational research: Determining appropriate sample size in survey research. *Information Technology, Learning and Performance Journal, 19*(1), 43–50.

Boateng, S. W. (2009). Significant country differences in adult learning. *Statistics in Focus, 44*, 1–11.

Boshier, R., & Collins, J. B. (1985). The Houle Typology after twenty–two years: A large empirical test. *Adult Education Quarterly, 35*(3), 113–130. doi: 10.1177/0001848185035003001

Chen, L., Kim, Y. S., Moon, P., & Merriam, S. B. (2008). A review and critique of the portrayal of older adult learners in adult education journals, 1980–2006. *Adult Education Quarterly, 59*(1), 3–21. doi: 10.1177/0741713608325169

Clemons A., & Vogt, C. (2004). Theorizing, restructuring and rethinking nonformal education in east and west African communities. *Current Issues in Comparative Education, 6*(2), 88–99.

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). New York, NY: John Wiley & Sons.

Costello, A. B., & Osborne, J. W. (2005). Best practices in Exploratory Factor Analysis: Four recommendations for getting the most from your analysis. *Practical Assessment Researchand Evaluation, 10*(7), 1–9.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334. doi: 10.1007/BF02310555

Dia, D., Smith, C. A., Cohen–Callow, A., & Bliss, D. L. (2005). The Education Participation Scale–modified: Evaluating a measure of continuing education. *Research on Social Work Practice, 15*, 213–222. doi: 10.1177/1049731504273543

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail and mixed–mode surveys: The Tailored Design Method* (3rd ed.). New York, NY: John Wiley & Sons.

Doerfert, D. L. (Ed.) (2011). *National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.

Egbezor, D. E., & Okanezi, B. (2008). Non–formal education as a tool to human resource development: An assessment. *International Journal of Scientific Research in Education, 1*(1), 26–40.

Etling, A. (1993). What is nonformal education? *Journal of Agricultural Education, 34*(4), 72– 76. doi:10.5032/jae.1993.04072

Houle, C. O. (1961). *The inquiring mind* (2nd ed.). Madison, WI: University of Wisconsin Press & Norman, OK: Oklahoma Research Center for Continuing Professional and Higher Education.

Kim, A., & Merriam, S. B. (2004). Motivations for learning among older adults in a learning in retirement institute. *Educational Gerontology, 30*, 441–455. doi:10.1080/03601270490445069

Kirby, D., Curran, V., & Hollett, A. (2009). Non–formal adult learning programs at Canadian Post–Secondary Institutions: Trends, Issues, and Practices. *Canadian Journal of University Continuing Education, 35*(2), 63–86.

Knowles, M. S., Holton, E. F., III, & Swanson, R. A. (2005). *The adult learner: The definitive classic in adult education and human resource development* (6th ed.). Burlington, MA: Elsevier.

Kuenzi, M. (2005). Non–formal education and community development in Senegal. *Community Development Journal, 41*(2), 210–222. doi: 10.1093/cdj/bsi050

Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse error in social science research. *Journal of Agricultural Education, 42*(4), 43–53. doi: 10.5032/jae.2001.04043

Mergener, M. A. (1979).The motivational orientations of pharmacists toward continuing education. *Dissertation Abstracts International, 39*(08), 3775B. (UMI No. 7820638)

Merriam, S. B., & Brockett, R. G. (2007). *The profession and practice of adult education: An introduction*. San Francisco, CA: John Wiley & Sons.

Merriam, S. B., Cafferalla, R. S., & Baumgartner, L. M. (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco, CA: Jossey–Bass.

Norton, S. P. (2007). The new reality: Participation of elected government officials of the state of Kansas in emergency management training post September 11, 2001. *Dissertation Abstracts International, 68*(04), (UMI No. 3259342)

Rabušicová, M., & Rabušic, L. (2006). Adult education in the Czech Republic – Who participates and why. *Czech Sociological Review, 42*(6), 1195–1218.

Schott, N. J. (2001). Volunteer motivation and satisfaction associated with the University of Illinois Extension Master Gardener program. *Dissertation Abstracts International, 61*(10),3847A. (UMI No. 9990131)

Schrock, D. S. (1999). A functional approach to understanding and assessing the motivation and retention of university extension Master Gardener volunteers. *Dissertation Abstracts International, 59*(12), 6508B. (UMI No. 9913378)

Shohel, M. M. C., & Howes, A. J. (2010). Models of education for sustainable development and nonformal education: A Bangladeshi perspective. *Journal of Education for Sustainable Development, 5*(1), 129–139. doi: 10.1177/097340821000500115

Strong, R., & Harder, A. (2010). Motivational orientations of adults participating in a Cooperative Extension Master Gardener Program. *Journal of Extension, 48*(4). Retrieved from http://www.joe.org/joe/2010august/pdf/JOE_v48_4rb2.pdf

Sundet, P. A., & Galbraith, M. W. (1991). Adult education as a response to the rural crisis: Factors governing utility and participation. *Journal of Research in Rural Education, 7*(2), 41–49.

Sutton, E. A. (2006). An evaluation of the Master Gardener Program in Arkansas. *DissertationsAbstracts International, 44*(05). (UMI. 15456)

Tassone, M. R. & Heck, C. S. (1997). Motivational orientations of allied health care professionals participating in a continuing education. *The Journal of Continuing Education in the Health Professions, 17*, 97–105. doi: 10.1002/chp.4750170203

Taylor, E. W. (2006). Making meaning of local nonformal education: Practitioner's perspective. *Adult Education Quarterly, 56*(4), 291–307. doi: 10.1177/0741713606289122

Tough, A. (1979). *The adult's learning projects: A fresh approach to theory and practice in adult learning* (2nd ed.). Toronto, Ontario: Institute for Studies in Education.

Van Den Berg, H. A., Dann, S. L., & Dirkx, J. M. (2009). Motivations of adults for non–formal conservation education and volunteerism: Implications for programming. *Applied Environmental Education and Communication, 8*(1), 6–17. doi:10.1080/15330150902847328

Yan–Fung, M., & Tsz–Man, K. (1999). Social–influence factors and motivations of participation in adult higher education. *Education Journal, 27*(2), 83–101.

Robert Strong is an Assistant Professor in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University, 2116 TAMU College Station, TX 77843, r–strong@tamu.edu

Amy Harder is an Associate Professor in the Department of Agricultural Education and Communication at the University of Florida, P.O. Box 112060, Gainesville, FL 32611, amharder@ufl.edu