

## DEVELOPING A SCALE TO RESEARCH AND EVALUATE YOUTH LEADERSHIP LIFE SKILLS DEVELOPMENT

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### Abstract

*In agricultural education, both 4-H and FFA have identified leadership development as central to their mission. Many Cooperative Extension Service and agricultural educators, members, and alumni think these organizations provide effective leadership programming. However, there is little research to support that viewpoint. The purpose of this study was to develop a valid, reliable scale to measure youth leadership life skills development. The first phase involved the conceptualization and operationalization of youth leadership life skills development (YLLSD). YLLSD was conceptualized as having seven sub-domains (Miller, 1976) and operationalized with 68 indicators. Each indicator used a four point Likert-type sub-scale. Face and content validity were assessed by a panel of experts. In the second phase, construct validity, reliability, and dimensionality were assessed. Data were collected during September and October, 1992, following the Dillman procedure. The target population was 6,388 senior 4-H and FFA members from New Mexico. A random sample of 400, stratified proportionally to ensure organizational representation was generated. A usable return rate of 66% was obtained. No differences were found between respondents and nonrespondents. During construct validity assessment, indicators of youth leadership life skills development were eliminated through item analysis, internal structure relationships, and cross-structure relationships. The final summated scale of 30 indicators had a Cronbach's alpha reliability coefficient of .98. Factor analysis was used to assess dimensionality. Although the final scale contains indicators from the seven original conceptual domains, youth in the study perceived the construct to be unidimensional.*

As the world enters the 21st century, many youth development programs are focusing on the effectiveness of their leadership training. As resources become more limited, these organizations are also becoming more accountable for meeting their goals. Assuming responsibility and accountability for developing youth leadership life skills today, assures the promise for effective leadership tomorrow.

In agricultural education, both 4-H and FFA are working toward leadership development. The Cooperative Extension Service (CES) and agricultural education have long been interested in whether or not 4-H and FFA programming are effective in developing youth leadership skills. Based on their experience, many CES and

agricultural education personnel, as well as past 4-H and FFA members think youth leadership programming is effective. However, there is little research to support that viewpoint.

Miller (1976, p.2) defined leadership life skills development as self-assessed and organization-specific "development of life skills necessary to perform leadership functions in real life." The literature shows that different researchers have attempted to measure this construct for different target populations. Miller (1975) and Miller (1976) are two of the earliest sources of indicators on youth leadership life skills development. Others have adapted these early works to measure leadership life skills development (Blackwell, 1990; Mueller, 1989; Orr & Gobel, 1986; Miller,

1981), among 4-H members. A sub-scale of the Leadership and Personal Development Inventory (Carter, 1989) has also been developed to assess leadership development. This sub-scale has been used with high school students (Carter & Spotanski, 1989). Luft (1986) assessed leadership development with young rural adults (i.e., ages 18-40) using 70 different indicators. The review of the literature revealed that to date, researchers have not completed the task of conceptualizing, operationalizing, and assessing the validity, reliability, and dimensionality of a measure of leadership life skills development for research and evaluation with both 4-H and FFA members.

### **Purpose of the Study**

The purpose of this study was to develop a valid and reliable scale to measure youth leadership life skills development. The following steps were followed to develop the scale:

1. conceptualize youth leadership life skills development
2. operationalize youth leadership life skills development
3. assess face and content validity
4. assess construct validity
5. assess reliability
6. assess dimensionality

### **Procedures**

#### Population/Sample Design

The target population for the study was 6,388 1993 senior 4-H and FFA members from New Mexico. Membership rosters, provided by the State 4-H office and the state supervisor of Agricultural Education, were used to determine the population size. At a 95% confidence level, a sample size of

362 was needed to represent the population (Krejcie & Morgan, 1970). This number was rounded to 400 (the confidence level increased slightly to 95.2% with this over sampling). A random sample, stratified proportionally to ensure organizational representation (i.e., 46% or 183 senior 4-H members and 54% or 217 FFA members), was then generated with a random numbers table.

The study used descriptive-correlational methodology. Variables measured by mail questionnaire were youth leadership life skills development, self-esteem, years in 4-H or FFA, and size of home community. Self-esteem, years in 4-H or FFA, and size of home community were included for construct validity assessment purposes.

#### Data Collection

Data were collected during September and October, 1992, following the Dillman (1978) procedure for mail questionnaire administration. The first three mailings (i.e., questionnaire, two-week postcard reminder, and four-week replacement questionnaire) were sent to the youth's home. Incentives were sent with each of these mailings to increase response rate. Seven weeks after the first mailing, a fourth mailing was sent to 4-H agents and secondary agricultural education teachers. These professionals were given a list of their senior 4-H members or FFA members who had not responded, and a supply of questionnaires and return-postage envelopes, and were asked to encourage listed youths to respond.

A return rate of n=241 (60%) and a usable return rate of 236 (59%) were obtained from the four mailings. To check for non-response bias, 11 non respondents (i.e., six 4-H and five FFA members) were contacted by phone. Their responses were pooled with the responses of 15 subjects who responded after the final return deadline. These pooled responses were compared with those of early respondents on youth leadership life skills development, self-esteem, years in 4-H/FFA, and size of home community, using Mann-

Whitney U and t-tests. No differences were found, therefore the data collected were considered to be representative of the target population. Non-respondents were pooled with respondents, yielding a final usable return rate of 66% (n=262).

### **Conceptualizing and Operationalizing Youth Leadership Life Skills Development**

The review of literature showed that a highly comprehensive conceptualization of youth leadership life skills development was developed by Miller (1976 & 1975). Miller (1975) used a modified Delphi technique to obtain consensus among 4-H members, volunteer adult 4-H leaders, and Cooperative Extension personnel in Oklahoma about youth leadership life skills developed in 4-H. They started with 68 leadership life skills in six "generic categories" (p.27): decision making, relationships, learning, management, understanding self, and group process. Only 17 of these 68 skills reached a consensual first-priority list (p.40). None of these skills were in the decision-making category.

Miller (1976) used opinions from a panel of Cooperative Extension Service experts to build upon the results of the Delphi study (Miller, 1975). The panel re-conceptualized leadership life skills developed in 4-H as having seven sub-domains including decision making and a new category, communication. The construct was re-operationalized with 60 indicators, with 12 that were on the first-priority list from the Delphi study.

Many other researchers measuring youth leadership life skills development have adapted the Miller (1976) re-conceptualization. Blackwell (1990) and Mueller (1989) purposively chose 25 indicators from the Miller (1976) list of 60. Orr and Gobeli (1986) also chose 14 indicators from the Miller (1976) list. The Carter (1989) Leadership and Personal Development Instrument contains six indicators specific to leadership. Five of these six match with indicators from the Miller (1976) list.

Luft (1986) measured leadership development among young rural adults with 70 indicators organized into four conceptual sub-domains (general leadership, speaking skills, group leadership skills, and work-related leadership). Three of these sub-domains match well with Miller's (1976) conceptualization. The work-related leadership sub-domain contains indicators that deal with occupation, and hence are not applicable to non-working youth. Additionally, Luft's (1986) indicators were not developed into a summated scale.

For the purposes of this study, youth leadership life skills development was conceptualized as having 68 indicators categorized into the seven sub-domains from Miller (1976) (Table 1). The 68 indicators of youth leadership life skills development came from the following sources:

1. the 60 indicators of leadership life skills developed in 4-H from Miller (1976).
2. three first-priority list indicators from Miller (1975) that were not among these 60.
3. two indicators dealing with manners and personal appearance and one indicator dealing with decision making from FFA materials by Harp (1984).
4. two researcher-developed indicators, one related to problem solving and the other related to learning by doing based on the 4-H and FFA mottos.

Among the 68 indicators, were five that matched five of the six indicators from Carters' (1989) sub-scale of leadership development in the Leadership and Personal Development Instrument. Doubled-barreled indicators, common among Miller's (1975, 1976) leadership development indicators, were simplified to measure single concepts. When making decisions to simplify double-barrelled indicators, the researchers chose the word that they felt youth would most likely

understand.

Each youth leadership life skills development indicator used a four-point sub-scale ranging from "no gain" to a "lot of gain". An example of an indicator in the communication sub-domain was: "As a result of my 4-H (FFA) experience I can speak before a group (no gain, slight gain, moderate gain, a lot of gain)".

### Face and Content Validity

Although 66 of the 68 indicators of youth leadership life skills development came from the literature and all 68 fell into one of the seven conceptual sub-domains (Table 1), the questionnaire was further assessed for face and content validity by a panel of seven experts. These included two state Cooperative Extension Service administrators, two faculty members in vocational education, a faculty member in educational administration, and two faculty members in research methods and statistics. The goal of subsequent mailings was to assess construct validity, reliability, and dimensionality, leading to the development of a summated scale for measuring youth leadership life skills development.

### Construct Validity

During construct validity, indicators of youth leadership life skills development were eliminated in the following manner:

Table 1. Conceptualization and Operationalization of Youth Leadership Life Skills Development

Conceptual Sub-domain	Number of Indicators
Communication Skills	11
Decision-making Skills	7

Skills in getting along with others	11
Learning Skills	10
Management Skills	11
Skills in understanding yourself	12
Skills in working with groups	6
TOTAL	68

### Item Analysis

Item analysis was performed on the scale of 68 indicators following steps outlined by Ary, Jacobs, and Razavieh (1990). The first step of this procedure called for dropping indicators that correlated below .25 with respondents' total score for the scale. No indicators were eliminated by this criterion. Next, the researchers looked for discriminating indicators. Indicators yielding data with low variance (i.e.,  $sd < .70$ ) or extreme skewness (i.e.,  $X > 2.5$ ) were eliminated. Based on these criteria, six indicators were eliminated, reducing the scale to 62 indicators.

### Internal Structure Construct Validity

Following item analysis, each indicator was evaluated in relationship to other indicators in the scale. An indicator was eliminated if it had a negligible or low association (measured by Spearman rho coefficients) with single indicators in the scale, i.e., its average inter-item correlation was below 0.40 (midpoint in the moderate association category of Davis, 1971) and it correlated below 0.40 with at least half of the other indicators in the scale. Based on these criteria, 26 indicators were eliminated, reducing the scale to 36 indicators.

### Cross Structure Construct Validity

Next, remaining indicators were evaluated in relationship to indicators of other concepts known to have relationship with youth leadership life skills development. Indicators of youth leadership life skills development should have stronger relationships with other indicators of youth

leadership life skills development than with indicators of other concepts. However, relationships between indicators of youth leadership life skills development and other concepts should be in the same direction as found in the literature.

For assessing cross-structure construct validity, three validators were included on the questionnaire based on presumed theoretical relationships with youth leadership life skills development: self-esteem (hypothesized positive correlation) (Blackwell, 1990; Mueller, 1989); years in 4-H or FFA (hypothesized positive correlation) (Miller, 1987; Orr & Gobeli, 1986; Waguespack, 1983); and size of home community, ranging from farm or ranch to suburb or city over 50,000 in population (hypothesized negative correlation) (Heinsohn & Cantrell, 1986). Criterion for assessing cross-structure validity were:

- a. An indicator was eliminated if it had at least a low association (midpoint in the low association category of Davis, 1971) with one or more of the validators (i.e., self esteem, years in 4-H or FFA, or size of home community). In other words, the absolute value of its correlation with one or more of the validators was greater than or equal to 0.20.
- b. An indicator was eliminated if the direction of the relationships between the indicator and the three validators was opposite from the hypothesized direction (i.e., the indicator had negative correlations with Rosenberg Self-Esteem (RSE) and years in 4-H or FFA, and a positive correlation with size of home community).

No indicators had at least a low association with RSE or size of home community. Six indicators had at least a low association with years in 4-H or FFA. Eliminating these reduced the scale to 30 indicators. No indicators were eliminated based on the criterion for direction of correlations with the validators. All seven of the original

conceptual sub-domains (Miller, 1976) are represented in the final scale (Table 2).

Table 2. Youth Leadership Life Skills Development

Conceptual Sub-domain	Number of Indicators
Communication Skills	2
Decision-making Skills	5
Skills in getting along with others	7
Learning Skills	4
Management Skills	3
Skills in understanding yourself	6
Skills in working with groups	3
TOTAL	30

### Reliability

Using Cronbach's coefficient alpha, reliability was assessed on the scale remaining after item analysis and construct validity assessment. The indicators most weakly related to the scale were to be eliminated in a stepwise fashion until the reliability coefficient peaked. However, the highest reliability had already been obtained without eliminating items. The final summated scale of 30 indicators had a Cronbach's alpha coefficient of .98. The scale is summarized by original conceptual sub-domains in Table 2.

Scale scores can range from 0 to 90. The frequency distribution of youth leadership life skills development scores from this study was slightly negatively skewed (i.e., 14% of allowable skewness as determined by the formula: percent possible skewness-[(mean= medium)/standard deviation] x 100). The distribution also had a slight ceiling effect, with 15 of the 262 (6%) respondents receiving a perfect score. Further analysis could determine if the ceiling effect was caused by response set or an artificial limitation imposed by

the scale. Using the scale with less homogenous groups may reduce the ceiling effect and skewness.

A secondary concern was the reliability of the Roseneberg Self-Esteem Scale (RSE) used as a validator for cross-structure construct validity assessment. The RSE is a 10-item, unidimensional Guttman scale (Wylie, 1974). Wylie (1974) reported a reproducibility coefficient of .92, a two-week test-retest reliability coefficient of .85, and convergent and discriminant validity for the RSE. A post hoc, split-half reliability assessment on the data from this study revealed a reliability coefficient of .68.

### **Dimensionality**

Principle factor extraction (using SAS PROC FACTOR Version 6.07) yielded evidence of a single factor. The largest eigenvalue of the correlation matrix was 15.11, accounting for 86% of the variability. The second eigenvalue was 0.964, accounting for 5.5% of the generalized variance. The third and fourth factors accounted for 3% and 2.4% of the generalized variance, respectively.

A four-factor solution was used to check for factor interpretability, as the single dominant eigenvalue suggested any interpretable factors must be correlated. An orthogonal (varimax) prerotation was used with a promax (oblique rotation) (Harman, 1980) to produce the final factor solution. The factor loading produced was incoherent; no reasonable interpretations of the factor loading were found. The researchers concluded a single factor existed in this population, contrasting with the seven sub-domains conceptualized by Miller (1975 & 1976).

### **Conclusions**

1. Care was taken to develop a valid and reliable 30-indicator summated scale for measuring youth leadership life skills development. Researchers were concerned

that items in the scale would be more highly correlated with other internal measures than external measures.

2. An original conceptualization of youth leadership life skills development from Miller (1976) identified seven sub-domains for the construct. Although the scale derived in this study contains indicators from these seven original conceptual sub-domains, youth in the population appeared to perceive the construct as unidimensional.

### **Recommendations**

1. In its entirety, the scale is a valid and reliable measure of youth leadership life skills development. The scale may be used as a dependent variable in a wide variety of studies using a wide variety of research designs, including studies that attempt to predict youth leadership life skills development based on youth organization participation and casual-comparative studies.
2. The instrument should continue to be assessed for validity and reliability with youth leadership organizations other than 4-H or FFA and in settings other than New Mexico.
3. The scale can also be used as an evaluation tool to assess youth leadership life skills development. Data can be obtained both formatively and summatively.
4. Due to perceived unidimensionality of this scale, researchers and practitioners are cautioned against using the indicators grouped by original sub-domain (Table 2), or any other arrangement, as sub-scales of youth leadership life skills development. Further research will determine if the scale is unidimensional for other target populations.

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