### The Journal of Extension

Volume 51 | Number 3

Article 28

6-1-2013

# Perceived Impact of the 2011 Texas 4-H Roundup on Participants' Development of Life Skills

Holli Leggette

Texas A&M University, holli.leggette@agnet.tamu.edu

**Shannon Lawrence** 

Texas A&M University, shannon.lawrence@agnet.tamu.edu

Kyle Merten

Texas AgriLife Extension Service, kjmerten@ag.tamu.edu

Peter McGuill

Texas AgriLife Extension Service, pjmcguill@ag.tamu.edu



This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 4.0 License.

#### Recommended Citation

Leggette, H., Lawrence, S., Merten, K., & McGuill, P. (2013). Perceived Impact of the 2011 Texas 4-H Roundup on Participants' Development of Life Skills. *The Journal of Extension, 51*(3), Article 28. https://tigerprints.clemson.edu/joe/vol51/iss3/28

This Research in Brief is brought to you for free and open access by the Conferences at TigerPrints. It has been accepted for inclusion in The Journal of Extension by an authorized editor of TigerPrints. For more information, please contact kokeefe@clemson.edu.



June 2013 Volume 51 Number 3 Article # 3RIB1

## Perceived Impact of the 2011 Texas 4-H Roundup on Participants' Development of Life Skills

#### Abstract

This article describes the perceived impact of the 2011 Texas 4-H Round Up on the participants' development of life skills. Senior 4-H Members, at least 18 years of age, who attended the 2011 4-H Roundup were the accessible population. Participants Leadership and Life Skill Development Scores, based on Seevers and Dormody's (1995) YLLSDS Instrument, were reported, as well as the most frequently participated in 4-H events. Results indicated that participants perceived gains in positive self-perception, goal setting, and problem solving, while changes in the ability to express feelings and trust others ranked lowest in the study.

#### Holli Leggette

Graduate Assistant
Texas A&M University
College Station, Texas
holli.leggette@agnet.t
amu.edu

#### Shannon Lawrence

Graduate Assistant Texas A&M University College Station, Texas shannon.lawrence@ag net.tamu.edu

#### **Kyle Merten**

4-H Extension
Program Specialist
Texas AgriLife
Extension Service
College Station, Texas
kjmerten@ag.tamu.ed
u

#### Peter McGuill

County Extension
Agent
Texas AgriLife
Extension Service
Wharton, Texas
pjmcguill@ag.tamu.ed
u

#### Introduction

Texas 4-H members strive to make the best better by participating in statewide events that promote the development of life skills (Texas 4-H and Youth Development, 2011a). Research has shown (Anderson, Bruce, & Mouton, 2010; Radhakrishna & Ewing, 2011; Seevers & Dormody, 1994) life skills (e.g., communication, decision-making, problem solving) development has a positive relationship with participation in 4-H leadership activities because members have the opportunity to apply their knowledge through hands-on activities.

Youth leadership and community involvement has long been an important part of 4-H programs nationwide (Anderson et al., 2010; Park & Dyer, 2005; Phelps & Kotrlik, 2007). The value of leadership has been recognized as a key component of 4-H: "Embedded in the very fabric of the mission and vision of these organizations are not only the attainment of agriculture and agriculture-related knowledge, but also leadership development" (Hoover, Scholl, Dunigan, & Mamontova, 2007, p. 100). This overarching vision of what youth agricultural organizations should provide is illustrated through the programs and services offered by Texas 4-H (Texas 4-H and Youth Development, 2011a).

During the past several years, studies have been conducted about specific 4-H programs and their

2

role in the development of youth life skills (Mantooth & Fritz, 2006; Real & Harlin, 2006; Tassin, Higgins, & Kotrlick, 2010). Although each study focused on a different component of 4-H, each showed evidence that 4-H membership and involvement were key to the development of youth life skills. Life skills discovered in the aforementioned studies included communication, decision-making, problem solving, self-discipline, self-motivation, teamwork, organization, and connecting youth to their community, all of which are important in developing productive citizens and effective leaders (Seevers, Dormody, & Clason, 1995). Additionally, 4-H alumni reported in various studies that their 4-H experience resulted in valuable leadership and life skills they could use in college, the workforce, and their community (Anderson et al., 2010; Park & Dyer, 2005; Radhakrishna & Sinasky, 2005).

Providing positive youth development is an important role of Extension agents, 4-H volunteers, and 4-H parents (Radhakrishna & Ewing, 2011). Documenting the influence of 4-H on youth nationwide has become an important part of the Extension system as well (Fox, Schroeder, & Lodl, 2003). Although studies (Anderson et al., 2010; Park & Dyer, 2005) have shown 4-H to positively affect today's youth, organizations have been faced with new challenges to solidify fiscal longevity, increase participation numbers, and provide rewarding experiences because of constrained educational budgets.

Program effectiveness has been and will continue to be documented as the need for accountability increases for 4-H programs (Seevers et al., 2011). Reduced funds and decreased budgets have increased the need for 4-H impact studies that reinforce the value of 4-H leadership and experiential learning activities (Fox et al., 2003; Mulroy & Kraimer-Rickaby, 2006). As youth practitioners build programs to promote positive youth development, they should be cognizant of the impact such programs have on life skills development and the need for documented accountability (Seevers et al., 2011). Fitzpatrick, Gagne, Jone, Lobley, and Phelps (2005) claimed more formal studies need to be done on the impact of 4-H activities on participants.

## **Purpose/Objectives**

Texas 4-H Roundup began in 1946 as a short course with workshops focusing on issues of rural America. Today, it is comprised of 43 competitive events and workshops that target more than 1,600 youth from across Texas (Texas AgriLife Extension, 2011). The purpose of the study was to examine Texas 4-H youth perceptions of life skills gained from the 2011 Texas 4-H Roundup. The following research questions guided the study.

- What life leadership skills were most developed as a result of participating in the 2011 Texas 4-H Roundup?
- What is the level of participation of 4-H Roundup participants in other 4-H activities?

#### Procedures/Methods

The quantitative, descriptive study sought to measure self-perceived youth leadership skills of 4-H members who participated in the 2011 Texas 4-H Roundup. Scores derived from the Youth Leadership Life Skills Development Scale (YLLSDS; Seevers et al., 1995) as revised by Wingenbach and Kahler (1997) served as the dependent variable. Level of involvement in 4-H activities, number

of years in 4-H, current place of residence, self-efficacy level toward work/projects, and grades in school served as the independent variables, which were also noted in the questionnaire by Wingenbach and Kahler (1997).

The population of interest for the study was 4-H members who participated in Texas 4-H Roundup with an accessible population (Ary, Jacobs, Razavieh, & Sorensen, 2006) of senior 4-H members who were at least 18 years old at the time (June 2011) of the event (N = 411).

The YLLSDS is a 30-indicator, one-dimensional instrument that includes seven constructs: communication skills, decision-making skills, skills in getting along with others, learning skills, management skills, skills in understanding yourself, and skills in working with others (Seevers et al., 1995).

Based on opinions of 4-H experts at the Texas 4-H and Youth Development Office, each statement of the YLLSD (Wingenbach & Kahler, 1997) was adapted to measure 4-H members' perception of life leadership skills gained from their participation in Texas 4-H Roundup. The four-point scale used by the YLLSD ranged from one to four (0 = no gain; 1 = slight gain; 2 = moderate gain; 3 = a lot of gain), with a summated scale of 90. Section two of the instrument contained 21 indicators modified from Wingenbach and Kahler (1997) and changed to reflect activities associated with 4-H. The 4-H members were asked to indicate their highest level of participation in each activity, ranging from zero to five (0 = no participation; 1 = local; 2 = district; 3 = state; 4 = regional; and 5 = national), with a summated scale of 105. Demographics elicited for the study were age, gender, current place of residence, average grades, and place of residence while participating in the 2011 Texas 4-H Roundup.

Reliability of each section was calculated using Cronbach's alpha (Cronbach, 1951). The reliability coefficient was 0.98 for the YLLSD section of the instrument and 0.87 for the 4-H Roundup index, which were all considered reliable (Field, 2009). Content validity of the instrument was established by Texas 4-H experts.

According to Dillman, Smyth, and Christian (2009), Web surveys are a sufficient way to reach large audiences quickly and efficiently; thus, the YLLSD was converted to a Web-based format. Using Dillman et al.'s Tailored Design Method (2009), the questionnaire was sent electronically using Qualtrics, a Web-based survey platform. The participants were contacted using four points of contact: pre-notification email, survey link email, follow-up email, and thank you email (Dillman et al., 2009). One hundred nine responses (26.52%) were received during the data collection period.

To address non-response error, days to respond was calculated as a regression variable (Lindner, Murphy, & Briers, 2001). Lindner et al. (2001) reported that if the regression coefficient is not statistically significant then there is no difference in the early and late respondents. The study yielded a regression prediction score of 0.80, which is not considered statistically significant (Field, 2009). Therefore, there were no differences in non-response (Lindner et al., 2001).

Data were analyzed using SPSS® version 20 to determine frequencies, percentages, means, standard deviations, and reliability.

## Results/Findings

Of the 109 participants, a majority were female (n = 63), achieved mostly A's (n = 77), and lived in a variety of places between farm (n = 23) and suburb or city > 50,000 (n = 28; see Table 1).

**Table 1.**Demographic Characteristics of Participants

| Category  | Subcategory                   | f <sup>a</sup> | %    |  |  |  |  |  |
|---|-------------------------------|----------------|------|--|--|--|--|--|
| Place of Residence  | Farm                          | 23             | 21.9 |  |  |  |  |  |
|   | Rural nonfarm or town <10,000 | 24             | 22.9 |  |  |  |  |  |
|   | Town or City 10,000 to 50,000 | 30             | 28.6 |  |  |  |  |  |
|   | Suburb or City > 50,000       | 28             | 26.7 |  |  |  |  |  |
| Cumulative Grades   | Mostly A's                    | 77             | 89.5 |  |  |  |  |  |
|   | Mostly B's                    | 9              | 10.5 |  |  |  |  |  |
| Gender  | Male                          | 39             | 38.2 |  |  |  |  |  |
|   | Female                        | 63             | 57.8 |  |  |  |  |  |
| Note. Frequencies <sup>a</sup> may not total 109 because of missing data. |                               |                |      |  |  |  |  |  |

Selected Texas 4–H members YLLSD (N = 98) scores ranged from 14.00 to 90.00 (M = 73.36; SD = 17.06; see Table 2). For years in 4-H, participants reported an overall mean of 9.64 and standard deviation of 2.16. The overall mean for the participants' age was 18.34 years and a standard deviation of 0.52.

Table 2.

Means and Standard Deviations for YLLSD, Years in 4-H, and Age

| Variable   | М     | SD    |
|--|-------|-------|
| Youth leadership and life skills development (YLLSD) | 70.69 | 21.37 |
| Years in 4-H   | 9.64  | 2.16  |
| Age  | 18.34 | 0.52  |

Analysis of individual survey items (see Table 3) revealed the top three skills were Show a responsible attitude (M = 2.63; SD = 0.65), Have a positive self-concept (M = 2.58; SD = 0.56), and Have a friendly personality (M = 2.55; SD = 0.68). The skills receiving the lowest ranking were Can express feelings (M = 2.20; SD = 0.81), Trust other people (M = 2.21; SD = 0.82), and Am

sensitive to others (M = 2.22; SD = 0.83).

**Table 3.**Means and Standard Deviations for Youth
Leadership and Life Skills

| Variable                                     | n   | М    | SD   |
|--|-----|------|------|
| Show a responsible attitude                  | 105 | 2.63 | 0.65 |
| Have a positive self-concept                 | 104 | 2.58 | 0.56 |
| Have a friendly personality                  | 105 | 2.55 | 0.68 |
| Have good manners                            | 104 | 2.54 | 0.74 |
| Can solve problems                           | 104 | 2.52 | 0.67 |
| Can use information to solve problems        | 105 | 2.52 | 0.63 |
| Can delegate responsibility                  | 104 | 2.50 | 0.68 |
| Can set goals                                | 104 | 2.50 | 0.66 |
| Recognize the worth of others                | 105 | 2.50 | 0.64 |
| Respect others                               | 105 | 2.50 | 0.71 |
| Use rational thinking                        | 104 | 2.50 | 0.64 |
| Can handle mistakes                          | 105 | 2.49 | 0.67 |
| Can listen effectively                       | 104 | 2.49 | 0.71 |
| Get along with others                        | 103 | 2.48 | 0.71 |
| Consider input from all group members        | 105 | 2.47 | 0.75 |
| Create an atmosphere of acceptance in groups | 103 | 2.47 | 0.74 |
| Can set priorities                           | 105 | 2.44 | 0.76 |
| Can be flexible                              | 105 | 2.41 | 0.70 |
| Can consider alternatives                    | 105 | 2.40 | 0.77 |
| Can be tactful                               | 104 | 2.38 | 0.75 |
| Can clarify my values                        | 103 | 2.38 | 0.77 |
| Consider the needs of others                 | 104 | 2.37 | 0.78 |
| Am open-minded                               | 104 | 2.36 | 0.82 |

| Can select alternatives   | 105 | 2.35 | 0.83 |  |  |  |  |
|---|-----|------|------|--|--|--|--|
| Am open to change   | 104 | 2.34 | 0.68 |  |  |  |  |
| Can be honest with others   | 105 | 2.34 | 0.71 |  |  |  |  |
| Can determine needs   | 104 | 2.32 | 0.70 |  |  |  |  |
| Am sensitive to others  | 103 | 2.22 | 0.83 |  |  |  |  |
| Trust other people  | 104 | 2.21 | 0.82 |  |  |  |  |
| Can express feelings  | 104 | 2.20 | 0.81 |  |  |  |  |
| Note. None = 0 - 0.50; Low = 0.51 - 1.50;<br>Adequate = 1.51 - 2.50; High = 2.51 - 3.00 |     |      |      |  |  |  |  |

Participants reported least involvement in Bee Keeping Essay (f = 47; 97.90%) and Dog Show (f = 43; 91.50%). Participants reported being active at the county level in Club Meetings (f = 27; 57.40%); at the district level in Leadership Lab (f = 20; 41.70%); at the state level in 4-H Roundup (f = 46; 95.80%); and at the national level in National 4-H Conference (f = 10; 20.80%) and in Judging Contests/ID Contests (f = 10; 20.80%; see Table 4).

**Table 4.**Frequencies for Participation Level of 4–H and Youth Development Activities

|                               | Level of Participation |      |        |      |          |      |       |      |          |      |
|-------------------------------|------------------------|------|--------|------|----------|------|-------|------|----------|------|
|                               | None                   |      | County |      | District |      | State |      | National |      |
| Variable                      | f                      | %    | f      | %    | f        | %    | f     | %    | f        | %    |
| 4–H Roundup                   | 1                      | 2.1  | _      | _    | _        | _    | 46    | 95.8 | _        | _    |
| Livestock Shows               | 9                      | 18.8 | 7      | 14.6 | 6        | 12.5 | 22    | 45.8 | 4        | 8.3  |
| National 4-H Congress         | 35                     | 72.9 | _      | _    | _        | _    |       | _    | 9        | 18.8 |
| National 4-H Conference       | 36                     | 76.6 | _      | _    | _        | _    |       | _    | 10       | 20.8 |
| Texas Congress                | 29                     | 60.4 | _      | _    | _        | _    | 18    | 38.3 | _        | _    |
| Judging Contests/ ID Contests | 11                     | 22.9 | 3      | 6.3  | 5        | 10.4 | 19    | 39.6 | 10       | 20.8 |
| Leadership Lab                | 14                     | 29.2 | 4      | 8.3  | 20       | 41.7 | 10    | 20.8 | _        | _    |
| 4-H Record Books              | 6                      | 12.5 | 3      | 6.3  | 16       | 33.3 | 22    | 45.8 | _        | _    |
| Elected Offices               | 5                      | 10.4 | 24     | 50.0 | 10       | 20.8 | 9     | 18.8 | _        | _    |
| Community Service             | 3                      | 6.3  | 16     | 33.3 | 8        | 16.7 | 12    | 25.0 | 9        | 18.8 |
| Bee Keeping Essay             | 47                     | 97.9 | _      | _    | _        | _    | 1     | 2.1  | _        | _    |
| Photography                   | 18                     | 38.3 | 9      | 19.1 | 5        | 10.6 | 15    | 31.9 | _        | _    |

| Shooting Sports       | 28 | 60.9 | 5  | 10.9 | 3  | 6.5  | 9  | 19.6 | 1 | 2.2 |
|-----------------------|----|------|----|------|----|------|----|------|---|-----|
| Junior Leadership Lab | 25 | 53.2 | 6  | 12.8 | 10 | 21.3 | 6  | 12.8 | _ |     |
| Food Show             | 18 | 38.3 | 4  | 8.5  | 16 | 34.0 | 9  | 19.1 | _ |     |
| Fashion Show          | 24 | 51.1 | 3  | 6.4  | 8  | 17.0 | 12 | 25.5 | _ |     |
| Club Meetings         | 2  | 4.3  | 27 | 57.4 | 10 | 21.3 | 7  | 14.9 | _ | ı   |
| Officer Training      | 10 | 21.3 | 16 | 34.0 | 13 | 27.7 | 8  | 17.0 | _ |     |
| Dog Show              | 43 | 91.5 | 1  | 2.1  | _  |      | 3  | 6.3  | _ |     |
| Gold Star Recognition | 17 | 36.2 | 9  | 19.1 | 15 | 31.9 | 6  | 12.8 | _ |     |
| 4-H Camps             | 12 | 25.5 | 6  | 12.8 | 10 | 21.3 | 18 | 38.3 | _ | _   |

#### Conclusions and Recommendations

The researchers concluded that, because the purpose of 4-H activities like Texas 4-H Roundup are important for youth to develop life skills (Texas 4-H and Youth Development, 2011a), the YLLSD instrument (Seevers & Dormody, 1995) was an accurate measurement of the impact of Texas 4-H Roundup on youth life skills development.

Additionally, the researchers concluded that Texas 4-H Roundup participants gained life skills development (M = 70.69; SD = 21.37), which included Show a responsible attitude (M = 2.63; SD = 0.65), Have a positive self-concept (M = 2.58; SD = 0.56), and Have a friendly personality (M = 2.55; SD = 0.68). Overall, participants reported being most active in 4-H Roundup (f = 46; 95.80%) and Club Meetings (f = 27; 57.40%).

## For 4-H Programming

- Use these findings to adjust 4-H Roundup.
- Provide critical information to 4-H practitioners that will help them design innovative programs and opportunities to assist in the development of youth life skills.
- Assist county Extension agents and 4-H Program Specialists in identifying the target audience of 4-H Roundup participants.

#### For Extension Administration

- Identify 4-H programs and activities to discontinue because of lack of participation.
- Use findings to convey the importance of 4-H Roundup and other 4-H activities to key stakeholders.

#### For Further Research

- Periodically assess the impact of 4-H Roundup and other major 4-H programs on life skill development in youth.
- Compare the life skill development of participants in other youth organizations to 4-H participants.

To continue the improvement of 4-H programs and activities, studies such as the one reported here should continue to be conducted in other 4-H activities. Although these findings cannot be generalized to other states, the study could be applicable to a variety of activities similar to Texas 4-H Roundup.

#### References

Anderson, J., Bruce, J., & Mouton, L. (2010). 4-H made me a leader: A college-level alumni perspective of leadership life skill development. *Journal of Leadership Education*, 9(2), 35–49.

Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C. (2006). *Introduction to research in education* (7th ed.). Belmont, CA: Thomson Wadsworth.

Cronbach, L. J. (1951). Coefficient alpha and the integral structure of tests. *Psychometrika*, 16(3), 297-334. doi:10.1007/BF02310555

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2009). *Internet, mail, and mixed-mode surveys: The tailored design method* (3rd ed.). Hoboken, NJ: John Wiley & Sons, Inc.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Fitzpatrick, C., Gagne, K. H., Jone, R., Lobley, J., & Phelps, L. (2005). Life skills development in youth: Impact research in action. *Journal of Extension* [On-line], 43(3) Article 3RIB1. Available at: <a href="http://www.joe.org/joe/2005june/rb1.php">http://www.joe.org/joe/2005june/rb1.php</a>

Fox, J., Schroeder, D., & Lodl, K. (2003). Life skill development through 4-H clubs: The perspective of 4-H alumni. *Journal of Extension* [On-line], 41(6) Article 6RIB2. Available at: <a href="http://www.joe.org/joe/2003december/rb2.php">http://www.joe.org/joe/2003december/rb2.php</a>

Hoover, T. S., Scholl, J. F., Dunigan, A. H., & Mamontova, N. (2007). A historical review of leadership develoment in the FFA and 4-H. *Journal of Agricultural Education*, 48(3), 100-110. doi: 10.5032/jae.2007.03100

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

Mantooth, L. J., & Fritz, C. A. (2006). Benefits of service-learning in Tennessee 4-H youth development: A delphi study. *NACTA Journal*, 50(3), 38–44. Retrieved from: <a href="http://www.nactateachers.org/vol-50-num-3-sept-2006/292-benefits-of-service-learning-intennessee-4-h-youth-development-a-delphi-study.html">http://www.nactateachers.org/vol-50-num-3-sept-2006/292-benefits-of-service-learning-intennessee-4-h-youth-development-a-delphi-study.html</a>

Mulroy, M. T. & Kraimer-Rickaby, L. (2006). The impact and sustainability of 4-H youth development programs. *National 4-H Council*. Retrieved from <a href="http://national4-hheadquarters.gov">http://national4-hheadquarters.gov</a>

Park, T. D., & Dyer, J. E. (2005). Contributions of agricultural education, FFA, and 4-H to student leadership in agricultural colleges. *Journal of Agricultural Education*, 46(2), 83-95.

Phelps, C. S., & Kotrlik, J. W. (2007). The relationship between participation in community service-learning projects and personal and leadership life skills development in 4-H leadership activities. *Journal of Agricultural Education*, 48(4), 67-81. doi: 10.5032/jae.2007.04067

Radhakrishna, R., & Sinasky, M. (2005). 4-H experiences contributing to leadership and personal development of 4-H alumni. *Journal of Extension* [On-line], 43(6) Article 6RIB2. Available at: <a href="http://www.joe.org/joe/2005december/rb2.php">http://www.joe.org/joe/2005december/rb2.php</a>

Radhakrishna, R., & Ewing, J. C. (2011). Relationships between 4-H volunteer leader competencies and skills youth learn in 4-H programs. *Journal of Extension* [On-line], 49(4) Article 4RIB2. Available at: <a href="http://www.joe.org/joe/2011august/rb2.php">http://www.joe.org/joe/2011august/rb2.php</a>

Real, L. A., & Harlin, J. F. (2006). Development of youth leadership life skills of Texas youth as San Antonio Livestock Exposition tour guides. *Journal of Leadership Education*, 5(1), 39-53.

Seevers,, B. & Dormody, T. J. (1994). Predicting youth life leadership skills development among senior 4-H members: A tri-state study. *Journal of Agricultural Education*, 35(3), 64–69. doi: 10.5032/jae.1994.03064

Seevers, B. S., Dormody, T. J., & Clason, D. L. (1995). Developing a scale to research and evaluate youth leadership life skills development. *Journal of Agricultural Education*, 36(2), 28–34. doi: 10.5032/jae.1995.02028

Seevers, B. S., Hodnett, F., & Leeuwen, D. V. (2011). Findings of 4-H impact studies in six western states. *Journal of Extension* [On-line], 49(4) Article 4FEA4. Available at <a href="http://www.joe.org/joe/2011august/a4.php">http://www.joe.org/joe/2011august/a4.php</a>

Tassin, M. G., Higgins, C. C., & Kotrlik, J. W. (2010). An examination of life skills development by Louisiana 4-H club officers. *Journal of Agricultural Education*, 51(2), 10-23. doi: 10.5032/jae.2010.02010

Texas 4-H and Youth Development. (2011a). Learn about 4-H... Retrieved from: <a href="http://texas4-h.tamu.edu/about/index.php">http://texas4-h.tamu.edu/about/index.php</a>

Wingenbach, G. J., & Kahler, A. A. (1997). Self-perceived youth leadership and life skills of Iowa FFA members. *Journal of Agricultural Education*, 38(3), 18–27. doi: 10.5032/jae.1997.03018

<u>Copyright</u> © by Extension Journal, Inc. ISSN 1077-5315. Articles appearing in the Journal become the property of the Journal. Single copies of articles may be reproduced in electronic or print form for use in educational or training activities. Inclusion of articles in other publications, electronic sources, or

systematic large-scale distribution may be done only with prior electronic or written permission of the <u>Journal Editorial Office</u>, <u>joe-ed@joe.org</u>.

If you have difficulties viewing or printing this page, please contact <u>JOE Technical Support</u>