Research Tools for Evaluating the Effects of a Vocational Horticulture Program on the Self-development of Female Inmates

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SUMMARY. Quantitative evaluation of horticulture vocational-therapy programs is becoming more and more critical as professionals in the area of people-plant interactions try to document the value of their programs. Evaluation tools to assess self-development of individuals studying such factors as self-esteem, life satisfaction, and locus of control have long been used in the social science disciplines. Many of these tools, either in their original forms or with some adaptations, can be successfully used to measure changes in self-development of individuals participating in horticulture programs.

Horticultural programs have served as effective means of enhancing the life quality to a multitude of audiences throughout history as well as providing horticultural skills and knowledge (Flagler, 1993; Relf and Dorn, 1995;

Rice and Remy, 1994; Shoulders and Wray, 1995). As a profession, horticultural therapy has existed for about 20 years and is relatively new compared to other therapy and caring professions. The need for statistical evaluation of horticulture programs, for vocational skill training as well as therapeutic effects, is widely recognized (Berry, 1975; Francis and Cordts, 1992; Relf, 1981).

In a prison setting, one of the purposes of vocational programs is to develop job skills conducive to the successful reentry of inmates into society (Halasz, 1982). In addition, it may be important to provide inmates with growth in values, beliefs, and attitudes that will enable the offender to return to and function in free society (Wiley, 1986). The following is a description of research tools and appropriate modifications that can be used to evaluate the effectiveness of a horticulture vocational-therapy program on the self-development of female inmates. Included in this discussion are the variables of internal-external locus of control, global self-esteem, and global life satisfaction.

INTERNAL-EXTERNAL LOCUS OF CONTROL. Internal-external locus of control is the aspect of personality that affects the way in which a person responds to his or her environment. MacDonald (1973) defines the concept as the extent to which people perceive contingency relationships between their actions and their outcomes. Rotter (1966) defined people who believe that they have some control over their destinies through either skill or capacity as "internals," whereas, "externals" are people who believe their outcomes are determined by agents or factors extrinsic to themselves such as fate, luck, chance, the unpredictable, or powerful others.

One research tool that can be used to measure the generalized internal-external locus of control of female inmates is Rotter's (1966) internal-external control of reinforcement scale. Rotter constructed the scale as a self-report measure of the generalized belief that a person can control his or her destiny. The original scale is a 29-item, forced-choice test that includes six filler items intended to make the purpose of the test somewhat more ambiguous (Rotter, 1966). Internal consistency estimates provided by Rotter are relatively stable, with alpha coefficients

ranging from 0.65 to 0.79. In developing a research tool to work with female inmates, 18 out of the 29 items from Rotter's original instrument are appropriate in their original form. Items 10, 22, and the 6 filler items can be deleted because of inappropriateness to the female inmate population. The remaining three questions can be included with simple wording modifications including changes from "he" to "she," "teachers" to "employers," and "grades" to "pay raises" to more appropriately align the survey with the research subjects. Two contrasting statements are presented for each question. Inmates select the statement they believed to be more true (Table 1).

Four questions, three of which need modification, from the multidimensional IE scale developed by Gurin et al. (1969) are also appropriate for the female inmate population. Gurin developed this test to study the locus of control of subordinated groups, specifically low-income or minority populations. She developed questions that were tailored to distinguish between "individual and system blame," which could easily be incorporated into a prison system population. Again, the modifications consist of simple changes in wording like "he" to "she" and "Negro" to "woman" (Table 2).

For research with this population, responses for both of the above-mentioned scales should be coded so that a 0 indicates an internal response, while a 1 indicates an external response. The items are then summed so that the total score reflects the total number of external choices made by the subject. Scores can range from 0 to 25. A low score, or the extent to which one is internally oriented, represents choices reflecting attribution to a causal relationship between what one does and what happens to her. A high score, or the extent to which one is externally oriented, represents frequent endorsements of items attributing causality to environmental factors such as fate.

Rotter's instrument (1966) is a generalized locus of control measure that may not be indicative of an individual's belief of control in a particular situation (Rotter, 1966; 1975). For this reason, Pugh (1992, 1994) developed and revised the prison locus of control scale. Pugh developed this instrument upon identifying a shortcoming of prison research, that being a lack of a locus of control measure

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specific to the prison setting. Internal consistency estimates of the scale included alpha coefficients ranging from 0.80 and 0.73 (Pugh, 1992). Eight items from Pugh's scale (1992) are appropriate when assessing female inmates' locus of control in relation to prison. One statement is presented for each item. Subjects respond by answering "Agree" or "Disagree" (Table 3). Responses should be coded so that

a 0 reflects an internal choice, while a 1 indicates an external choice. Scoring involves the addition of all external choices. Scores range from 0 to 8, with higher scores indicating a more external locus of control.

GLOBAL SELF-ESTEEM. Global self-esteem is an overall evaluative attitude toward the self (Luhtanen and Crocker, 1992). Rosenberg (1979) characterized a person with high self-esteem as

someone who considers him- or herself a person of worth, has self-respect, appreciates his or her own merits, and, while recognizing his or her faults, hopes and expects to overcome his or her shortcomings. An individual with low self-esteem is someone who lacks respect for him- or herself, and considers him- or herself unworthy, inadequate, or otherwise seriously deficient as a person.

Table 1. Questions, with modifications, appropriate for assessing locus of control of female inmates from the Internal External Control of Reinforcement Scale (Rotter, 1966).

Question no. ^z	Question narrative ^y
2	a. Many of the unhappy things in people's lives are partly due to bad luck. b. People's misfortunes result from the mistakes they make.
4*	a. In the long run a person gets the respect she deserves in this world. b. Unfortunately, an individual's worth often passes unrecognized no matter how hard she tries.
5*	a. The idea that life is unfair to a person is nonsense. b. Most people don't realize the extent to which their lives are influenced by accidental happenings
6	a. Without the right breaks one cannot be an effective leader. b. Capable people who fail to become leaders have not taken advantage of their opportunities.
7	a. No matter how hard you try some people just don't like you. b. People who can't get others to like them don't understand how to get along with others.
9	a. I have often found that what is going to happen will happen. b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
11	a. Becoming a success is a matter of hard work; luck has little or nothing to do with it. b. Getting a good job depends mainly on being in the right place at the right time.
12	a. The average citizen can have an influence in government decisions. b. This world is run by the few people in power, and there is not much the little guy can do about it.
13	a. When I make plans, I am almost certain that I can make them work. b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14	a. One of the major reasons why we have wars is because people don't take enough interest in politics. b. There will always be wars, no matter how hard people try to prevent them.
15	a. In may case getting what I want has little or nothing to do with luck. b. Many times we might just as well decide what to do by flipping a coin.
16	a. Who gets to be the boss often depends on who was lucky enough to be in the right place first. b. Getting people to do the right thing depends upon ability; luck has little or nothing do so with it.
17	a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand or control. b. By taking an active part in political and social affairs, the people can control world events.
18	a. Most people don't realize the extent to which their lives are controlled by accidental happenings. b. There is really no such thing as "luck".
20	a. It is hard to know whether or not a person really likes you. b. How many friends you have depends upon how nice of a person you are.
21	a. In the long run the bad things that happen to us are balanced by the good ones. b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
23*	a. Sometimes I can't understand how employers arrive at the pay raises they give. b. There is a direct connection between how hard I work and the pay raises I get.
25	a. Many times I feel that I have little influence over the things that happen to me. b. It is impossible for me to believe that chance or luck plays an important role in my life.
26	a. People are lonely because they don't try to be friendly. b. There's not much use in trying to hard to please people; if they like you, they like you.
28	a. What happens to me is my own doing. b. Sometimes I feel that I don't have enough control over the directions my life is taking.
29	a. Most of the time I can't understand why politicians behave the way they do. b. In the long run the people are responsible for bad government on a national as well as a local level.

^zQuestion numbers are from the original Internal External Control of Reinforcement Scale (Rotter, 1966).

^yTwo contrasting statements are presented for each question. Inmates select the statement they believe to be more true.

*Questions were modified from original form.

Table 2. Questions, with modifications, appropriate for assessing locus of control of female inmates from the Multidimensional IE Scale (Gurin et al., 1969).

Question no. ^z	Question narrative ^y
9*	a. Knowing the right people is important in deciding whether a person will get ahead. b. People will get ahead in life if they have common sense and do a good job, knowing the right people has nothing to do with it.
11	a. People who don't do well in life often work hard, but the breaks just don't come their way. b. Some people just don't use the breaks that come their way. If they don't do well, it's their own fault.
24*	a. The best way to handle problems of sexual discrimination is for each individual woman to make sure she gets the best training possible for what she wants to do. b. Only if women pull together in civil rights groups and activities can anything really be done about sexual discrimination.
39*	a. If a woman only tries hard enough, she can get ahead despite opposition from society. b. It's true that an individual woman can get ahead by hard work, but every woman will sometime face discrimination or opposition that can't be solved by individual effort alone.

^zQuestion numbers are from the original Multidimensional IE Scale (Gurin et al., 1969).

^yTwo contrasting statements are presented for each question. Inmates select the statement they believe to be more true.

*Questions were modified from original form.

The 10-item Rosenberg (1965) self-esteem scale (RSE) is appropriate when assessing the global self-esteem of female inmates. The RSE was formulated to assess the self-appraisal of the individual and was specifically designed with ease of administration and brevity in mind (Rosenberg, 1965). Half of the items are phrased positively, e.g., "I take a positive attitude toward myself." The other five items are negatively worded, e.g., "I feel I do not have much to be proud of." Regarding internal consistency, Wylie (1989) cited five studies that report alpha coefficients for the RSE ranging from 0.72 to 0.87. Research also supports the unidimensionality of the RSE when used with college-age persons (Hensley, 1977; Hensley and Roberts, 1976) and with adults (O'Brien, 1985). Unidimensionality refers to the scale measuring only one concept, such as intelligence, and not two or more concepts, such as intelligence and achievement (Borg and Gall, 1989).

The RSE can be modified from its original form in two ways to fit the needs of assessing the female inmate population. First, items are scored on an additive basis, rather than using Guttman scaling, which is another method of measuring attitudes (Borg and Gall, 1989). Second, with the inclusion of a "Neither agree nor disagree" option, the response format includes five response alternatives on a Likert-type scale (Table 4). Responses range from "Strongly agree" to "Strongly disagree." In addition, negatively worded items are reversed in scoring so that all items are keyed in a

positive direction. Crandall (1973) reported validity evidence in support of scoring the RSE this way. Each item is scored on a range of 1 to 5. The scores of the 10 items are then summed. Self-esteem scores can range from 10, indicating low self-esteem, to 50, indicating high self-esteem.

GLOBAL LIFE SATISFACTION. Life satisfaction is defined as the global assessment of a person's quality of life according to his or her chosen criteria (Shin and Johnson, 1978). Diener et al. (1985) emphasized that the extent to which people judge their life satisfaction is not externally imposed, rather is based on comparison to a standard that each person has set for him- or herself.

To assess the global life satisfaction of female inmates, the five-item satisfaction with life scale (SWLS) developed by Diener et al. (1985) is appropriate. All scale items are posi-

tively worded, e.g., "I am satisfied with my life." Coefficient alpha levels for this test have been reported ranging from 0.82 to 0.87 (Diener et al., 1985). Further analyses have confirmed the unidimensionality of the scale (Lewis et al., 1995; Shevlin and Bunting, 1994).

To add consistency with the other test formats described above, responses for the SWLS should be rated on a 5-rather than a 7-point Likert-type scale. Each item is scored from 1 "Strongly disagree" to 5 "Strongly agree." The five item scores are then summed. SWLS scores range from 5, indicating low life satisfaction, to 25, indicating high life satisfaction.

Given that horticultural therapy is a new field, professionals in this area may have considered developing entirely new tools to measure variables of interest. As discussed here, however, there are many assessment tools avail-

Table 3. Questions, with modifications, appropriate for assessing locus of control of female inmates from the Prison Locus of Control Scale (Pugh, 1992,1994).

Question no. ^z	Question narrative ^y
1	This prison has total control over me.
2	The way prison staff treats me depends on how I act.
3	Getting parole has more to do with luck than anything else.
4	I can't get prison officials to notice when I do good.
5	I can get along with most everyone in prison.
6	Even in prison I can get the respect I deserve.
7	It makes little sense to plan in prison because you never know what will happen.
8	Most of what happens to me in prison is out of my hands.

^zQuestion numbers are from the original Prison Locus of Control Scale (Pugh, 1992,1994).

^yOne question is presented for each item, inmates respond by answering "agree" or "disagree."

able that can be altered or used in the original format to conduct research on horticulture vocational-therapy programs. This paper reviews several tools and demonstrates how and where they can be used, giving examples of how to quantify the results. Hopefully, reviews such as this will provide valuable information to researchers in the area of people-plant interactions and enable them to begin to quantify the benefits of horticulture vocational-therapy programs.

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