

# **Weeds and Seeds: Reflections from a Gardening Project for Juvenile Offenders**

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*Efforts to engage juvenile offenders in beneficial programming that promotes prosocial skills is often difficult. Gardening, however, is one activity that has shown preliminary benefits for incarcerated populations. This research adds to that small body of knowledge by reporting on a formative evaluation examining the use of a gardening program in a juvenile rehabilitation center. Nineteen youth participated in a gardening project during the summer of 2010. Qualitative and quantitative data suggest that the youth benefit from gardening. Two themes, gardening promotes a new self concept and gardening helps emotional and behavioral management, emerged. Implications for future practice and research are discussed.*

## **INTRODUCTION**

During the spring of 2009 the staff of a juvenile rehabilitation center housing adolescents adjudicated for felonies began a gardening project to provide an opportunity for youth to develop recreational and leisure activities, to increase landscaping and horticulture job skills, and to enable restorative justice for their criminal behaviors by growing food to donate to local shelters and community kitchens (personal communication, A. Opicka, April 7, 2010). A small grant was received to purchase gardening tools and seeds. At the end of the gardening season, the staff and the youth felt the project was a success. Over 960 pounds of food were grown and donated by 20 youth. They had positive comments about participating in the gardening project and expressed that it had helped them, but no data had been collected to support the claims.

The gardening project was undertaken again during the summer of 2010. Modifications included increasing the gardening area from 2,000 square feet to 6,000 square feet and inviting master gardeners to share their expertise. Additionally, plans to collect data on the effectiveness of the gardening project were established. This paper presents the findings of a pilot project involving gardening in a youth rehabilitation center. The research questions were formative and designed to help promote programming to benefit juvenile offenders.

## **LITERATURE REVIEW**

Therapeutic horticulture programs have been shown to help diverse at-risk populations improve psychosocial outcomes. Through his work with children, Majuri (2009) postulated that self-awareness, empathy, patience, and trust could all be fostered through gardening. These qualities are seen as important traits that are often underdeveloped or absent in youth involved with the juvenile justice system (Dolan & Rennie, 2006; Wiebe, 2006; Hunter, Figueredo, Becker & Malamuth, 2007; Drerup, Croysdale & Hoffmann, 2008; Hussey, Drinkard, Falletta & Flannery, 2008; Barriga, Sullivan-Cosetti & Gibbs, 2009; Le Corff & Toupin, 2009).

Across multiple settings and among clients with different psychosocial problems, participating in gardening has shown positive outcomes. Pierce and Seals (2006) found that self-efficacy of women in a homeless shelter went up following a 12-week gardening program. Qualitative data from the participants indicated that the women felt more "peaceful," "patient," and "relaxed" because of the time spent in the garden (p.24). Szofran and Myer

(2004) conducted a pilot program with mental health clients enrolled in a day treatment program. Participants reported elevated mood following gardening, while their therapists reported that the gardening participants were on task more during gardening than during other day treatment milieu.

Hale, Marlow, Mattson, Nicholson, and Dempsey (2005) conducted a study in which individuals on probation were randomly assigned either to a horticulture group, in which they participated in gardening activities, or a community service group in which participants engaged in tasks such as trash and cemetery clean-up. Approximately 25% of the horticulture group recidivated, whereas approximately 50% of the community service group committed a new crime.

Gardening programs have also benefited those behind bars. Historically, prison farming was designed as a cost effective way to feed inmates or to create a profit for the prison (Taylor, 1999; Jiler, 2006; McShane, 2008). Riker's Island has one of the most comprehensive gardening programs for inmates (Jiler, 2006). The GreenHouse Program on Rikers was created by the Horticulture Society of New York to provide inmates with job skills, horticulture education, and therapy through work with plants in hope that the gardening experiences would lead to meaningful work upon reentry into society and reduce recidivism (Jiler, 2006). The San Francisco County Jails' Garden Project is a similar program which helps incarcerated individuals, former inmates, and at-risk youth learn horticulture skills (The Garden Project, 2000). The organic produce grown benefits local senior citizen and youth centers.

Sandel (2004) studied a gardening program in a juvenile detention center. Following implementation of the garden project, there was a 25% decrease in disruptive episodes and staff reported an increased calm in the facility. Unexpectedly, the correctional staff who worked with the youth in the garden reported lower stress and anxiety in their personal and professional lives.

### **PURPOSE OF THE STUDY**

While most gardening programs undertaken by jails and prisons benefit the community by donating surplus plants and food, little is known about what offenders think about their work in the garden. This study seeks to fill the gap in the literature by examining characteristics of a gardening project in a juvenile rehabilitation center in which the goals of the gardening project include

reintegrating juvenile offenders into society by allowing them to serve others through providing and donating food. The research questions are formative and designed to help promote programming to benefit juvenile offenders. The research questions are:

1. How do youth perceive their participation in the gardening project?
2. Do the youth perceive the gardening project as a form of restitution to the community?
3. Do self-efficacy scores change over the course of the project?

### **METHOD**

The research project was conducted at a juvenile rehabilitation center in southwestern Ohio. The center is funded by the state and county juvenile justice systems. The facility can accommodate 30 youth; during the time of the research project, the daily census ranged from 27-29 youth. The research took place between June and September of 2010. This was the second year of the gardening program and the first year in which it was evaluated. The research project was reviewed and approved by Wright State University's IRB and an individual who serves as the state's prisoner advocate.

### **Participants**

Eligibility to participate in the gardening project was determined by the juvenile rehabilitation center staff based on appropriate behavior and safety responsibilities. The juvenile rehabilitation center was a 24-hour locked facility in which youth serve sentences for felony delinquency. Most youth serving time have had previous criminal histories in which community intervention had not worked. Youth had typically been at the rehabilitation center for 75-90 days before becoming eligible to participate in the gardening project. Youth were required to be on level three of the behavior management system (there are four levels with the fourth level representing the most appropriate behavior) and be classified as low-risk to participate. All youth eligible to garden were eligible to participate in the research project.

A total of 19 youth participated in the research project: 15 were male and 4 were female. The average age of the participants was 15.6 (range 13-17). Nearly 79% of the participants were Caucasian, 5% were African American, and 16% were classified as other races. Felonies for which youth were serving time included burglary, theft and attempted theft, gross sexual imposition, and rape.

The most common commitment offenses were burglary or theft ( $n=9$ ), followed by rape and gross sexual imposition ( $n=7$ ). Approximately 53% of participants had a secondary charge related to drug or alcohol use (e.g., possession, underage drinking). Participants had an average of 4.79 offenses (range 0-15) prior to being sent to the rehabilitation center. The average length of stay was 279.42 days (range 90-594). Over 31% of participants had an identified special education need.

### **Instruments**

Open-ended questions were used to collect qualitative data. The researchers worked with the rehabilitation center staff to develop interview questions. The first interview consisted of eight open-ended questions about likes, dislikes, and skills learned as part of the gardening project. The second interview consisted of eight open-ended questions about the youths' criminal behaviors, attitudes about gardening, and thoughts about donating the grown produce as a form of restitution. Nineteen participants completed the first interview, while fourteen of the original nineteen completed the second interview. Five participants were discharged before the second interview could take place.

In addition to the collection of the qualitative data, a scale was adapted from the Compton Community College Department of Psychology Gardening Study Questionnaire (Hoffman, Trepagnier, Thompson & Cruz, 2003, cited in Pierce & Seals, 2006). Modifications were made to capture data relevant to gardening in a juvenile correctional facility. Fourteen Likert scale questions (i.e., strongly disagree, disagree, not sure, agree, or strongly agree) were developed that incorporated concepts of self-efficacy. Following these changes, the instrument (the Juvenile Detention Gardening Questionnaire) was shown to two consultants, one each in juvenile corrections and social work, to establish face validity. The participants completed the questionnaire at the first interview and again at the second interview.

### **Data Collection and Analysis**

Thus, over the course of the project, two interviews were conducted with each participant. Parental consent and youth assent were obtained. All interviews were conducted by the second author who was a senior social work student. The research project was part of her social work practicum and fulfilled her capstone requirements as part of the university's civic engagement certificate. The first round of interviews took place in late June.

Participants had grown plants from seed, planted them in the garden, and were tending to the crops. Delays by the prison advocate in reviewing the IRB materials prevented the study from starting in a timely fashion. As such, IRB approval to conduct the study was not granted until mid June and, as a result, participants had been gardening for approximately eight weeks before data was collected. Interviews took 30-45 minutes and participants were compensated with a candy bar and non-caffeinated soda for their time. Participants also completed the Juvenile Detention Gardening Questionnaire.

The second round of interviews took place in late August approximately nine weeks after the first interview. At that time, participants had been tending to the garden, picking the crops, and delivering fresh produce to food pantries and community kitchens. During the second interview, participants were asked eight questions about their criminal behaviors, attitudes about gardening, and donating the produce as a form of restitution. Interviews took 40-60 minutes and participants were compensated again with a soda and candy bar. Participants were prompted to think about their time in the garden and at the social service agencies assisting the hungry and to answer questions about the project. Participants were also given their typed responses from the first interview and asked if they had additional information to add to their responses. Participants again completed the Juvenile Detention Gardening Questionnaire. At the end of data collection, demographic information was coded from the internal juvenile court records system. Information such as age, race, gender, criminal history, behavior violations in the rehabilitation center, and educational history were collected.

In order to analyze the qualitative data, the interview responses were recorded and themes were determined. The data were independently analyzed by the researchers. The authors discussed the identified themes to accurately capture the participants' meaning. The themes were applied to the evaluation questions for the purpose of learning about how the participants viewed their gardening experiences.

### **RESULTS**

Quantitative and qualitative data were collected to answer three formative research questions.

#### **Research Question 1: How Do Youth Perceive their Participation in the**

## Gardening Project?

Participants saw their experiences in the garden as positive. Two themes emerged including that gardening promoted positive self concepts and helped with emotional and behavioral management. All participants articulated reasons why youth who were not eligible to participate in the gardening project were "losing out." Negative comments about gardening were trivial and anticipated given the age and population of the participants. One participant's statement captured the dislikes of the group. He said, "I didn't like the blisters on my hands or getting sun burnt or the option of being able to run into snakes. I also did not like hoeing and tilling." Several participants, however, indicated that the worst part of gardening was not getting to do it every day.

### *Theme 1: Gardening Promotes a Positive Self Concept*

One theme that emerged was that gardening helped the participants develop a positive self concept. This theme was broken into three sub-themes that included *self as hard worker*, *self as responsible*, and *self as a learner of new interpersonal skills*.

*Self as hard worker.* Nine participants talked about how working in the garden changed their opinions about themselves when it came to hard work. The following three quotes exemplify the thoughts of the participants:

*I learned that I am more organized. I am a good teacher and a fast learner. I realized that I am important... people looked up to me [in the garden] and that makes me feel good. I now understand how hard a worker I am. I could not see that before [working in the garden], but now I see it.*

*I learned I like to work. I was one of those teenagers that chilled, played Xbox, and smoked. Now I realize I look forward to gardening.*

*I learned that I am a hard worker. I did not know that before. I have learned to have a work ethic. My new work ethic will help me be better at home because I will be more willing to complete my chores.*

*Self as responsible.* Four participants discussed how taking care of the plants helped them develop personal responsibility. Participants articulated with pride the exact plants and vegetables they were responsible for planting. Inherent in the responses was a sense of

accomplishing a task that was seen as valuable. One participant said:

*I have learned responsibility from my time in the garden and that will help me when I go home. You have to be responsible to garden and devote the time necessary for the garden to grow. I will also help my dad more in the garden when I get home - before I thought of it as punishment, but now I like to garden.*

Another stated: "I like the sense of responsibility. I feel trusted in the garden and it doesn't feel as much like a lockdown facility."

*Self as learner of new interpersonal skills.* While nearly all participants expressed that they learned academic content from the master gardeners (e.g., "There are good bugs" and "You cannot touch the roots of the plants when planting them because the things on your hands will get transferred and can kill the plants"), six participants noted new interpersonal skills. The following three quotations help describe the reactions of the participants:

*I used to be more of a loner and now I know I can be more social and take a leadership role. I had following down pretty well... I am glad to learn I can be a leader.*

*I feel more open to share things about myself. I'm a little more open [to others] when I am working in the garden.*

*I learned that I can actually learn new things if I want to and I am more open to learning. I also know that I can work with other people. I had problems with others in the past, but when I work in the garden it is different.*

### *Theme 2: Gardening Helps Emotional and Behavioral Management*

Twelve participants discussed how gardening helped them regulate their emotions and the resulting behaviors. Several of the participants talked about being with nature, getting your hands dirty, and the repetitive nature of the tasks such as weeding or mowing as being calming. Two participants spoke of being "too tired" after gardening to be angry or fight with others. The following examples demonstrate how gardening helped the participants modify their emotional and behavioral responses:

*Some of the other kids don't like me and would call me names. I would get upset before [I worked in the garden]. Now, I can handle it better and it doesn't bother me as much. Gardening makes a difference in my behavior.*

*Gardening has helped with teaching me patience. I couldn't go out there and just tear stuff up. I had to be patient with weeding and I had to think before acting in the garden. You can't just step on things... that would ruin the garden. It also helped me with being impulsive. I couldn't just yell when people were not working hard.*

*I like weeding. You have to be observant and concentrate more. I was not so good at that before. It takes a lot to know what to pick out and what to leave.*

*The patience I learned will help me when I go to my foster family after I am released. [Gardening] has helped me to understand people better. I have more patience with myself and others.*

### **Research Question 2: Do the Youth Perceive the Gardening Project as a Form of Restitution to the Community?**

The majority of the participants felt positively about donating the food to those in need. Participants talked about "feeling good" about their work and the donated food, but few responses could be classified as a discussion of the project as restitution. The concept of restitution was noted in the following comments:

*This experience has taught me how to volunteer. I like doing it and being able to give back. Helping the homeless and hungry by giving the food away makes me feel like I am making some repayment.*

*It [donating food] gives me a way to fix some of the things I've done.*

Rather than restitution, the participants' responses were better classified as a development of empathy stemming from the work in the garden and the resulting food that was donated. Seeing the people receive the fresh produce at the pantry or community kitchen seemed to be integral to the experience. For example, one participant said, "After going to the food pantry, I see the big picture. I cannot continue to be selfish when others are going without." Another stated, "We garden and pick

for hours and it only takes someone 10 minutes to eat it. But, it makes me feel good to feed people that need it."

Participants commented that, prior to the gardening and service experiences, they were focused on their own lives and unaware of the struggles of others. The following quotations illustrate the participants' developing empathy:

*It makes me feel good that what we are growing is going to a good cause. I will no longer waste food. Before I did not care, but now I understand that there are people going hungry and how wasteful we are.*

*It's [gardening] a life altering experience. Donating food made me change my perspective. I used to be self-centered and now I think about others and I want to grow my own garden and donate food [when I go home]. Taking the donations changed my life.*

*I like helping others and making sure that others have something to eat. I've never been without food, but now I understand that people do go without. Some lettuce rotted and we had to throw it away and that was very disappointing because we couldn't give it away. I was really self-centered before and now I know that I care about people and have a big heart when it comes to helping others.*

*With [major corporation] leaving [community], the residents were really hard hit and I really did not understand the impact on the people before going to the soup kitchen. It feels good to give back to other people. There are people that need things more than I do. I am really spoiled and I realize that I am very lucky to have what I have.*

In addition to seeing how the donated food helped others, the participants also commented on other ways they could serve the community. Participants made statements about future plans for giving such as "I am going to try to get my family involved in volunteering," "I could be an organ donor," and "I will take old clothes to the Salvation Army."

Participants were asked to rank how much growing and donating the food "made up for your crime" on a scale of 1 (not at all made up for what I did) to 10 (completely made up for what I did). The average ranking was 5 (range 3-8). The following quotations help explain what the participants were thinking when they assigned the

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
After working in the garden, I feel better about myself.		1	1	11	6
I feel satisfied about the work I have done in the garden.			1	8	10
After working in the garden, I feel better about my ability to finish things.		1	2	10	6
After working in the garden, I feel more relaxed.			3	6	10
Since I began working in the garden, I do a better job of talking about how I feel.		5	5	6	3
Since I began working in the garden, I feel that I can do better in school.		1	9	8	1
Since I began working in the garden, I feel that I get along better with my peers.			4	10	5
Since I began working in the garden, I feel that I get along better with the staff.		1	4	10	4
Since I began working in the garden, I feel more confident that I will avoid trouble with the law when I go home.		2	4	10	3
I feel good that the food I will grow will help feed people who were hungry.			1	2	16
Giving away the food I will grow will help make up for the trouble I caused by committing crime.	2	3	6	7	1
I think working in the garden has helped me become a more responsible person.		1	3	8	7
When I go home, I will continue gardening			5	7	7

**Table 1:** Scores on the Juvenile Detention Gardening Questionnaire collected at the first interview (n=19).

ranking:

*I think donating the food is the coolest thing ever. We grew it and we are giving back to those that need it. It doesn't make up for what we did, but it makes it better, it softens it. We are doing something about what we did. It is better than sitting in [detention] doing nothing.*

*It makes me feel better about my actions, but it does not make up for what I did. I have to own that. It makes me feel better because I took from someone else that probably needed what I took so giving back kinda cushions that.*

Some participants were more critical when talking about the food donation as a form of restitution. Several youth stated they “had to take responsibility for their crime” and implied that donating the food let them “off the hook” for their behavior. For example, two participants

said the following:

*I know that good things come out of working hard. If we were not working all the time, then we wouldn't have anything to give away. But, giving away the food does not make up for or excuse what we did. We have to accept it.*

*I don't really see how one equals the other when it comes to me doing this [giving away food] to make up for my offense.*

Two participants were concerned that the food donations carried less weight because they were not given directly to the people or communities harmed by their crimes.

**Research Question 3: Do Self-efficacy Scores Change over the Course of the Project?**

This project was a formative evaluation. At the outset

of the project, the researchers intended to measure changes in pretest and posttest scores. However, delays in beginning the study that prevented a true pretest, coupled with a limited sample size, prohibited such a statistical analysis. The participants did, however, respond favorably to the questions assessed at the first interview which took place approximately eight weeks into the gardening project. Over 89% of the participants agreed or strongly agreed that they felt better about themselves following work in the garden and 84% agreed or strongly agreed that they felt relaxed after gardening. With the exception of the five missing scores due to participants' discharge, the data collected at the second interview were similar to the first interview scores. For example, 86% of participants continued to support the statement that gardening helped them relax.

## DISCUSSION

This study was a formative evaluation designed to answer three research questions regarding the effectiveness of gardening in a juvenile rehabilitation center. The gardening project was viewed positively by the participants. Two themes, *gardening promotes a new self concept* and *gardening helps emotional and behavioral management*, emerged. Within the theme *gardening promotes a new self concept*, participants discussed the roles of hard work, responsibility, and learning new interpersonal skills.

The qualitative data indicated that gardening helped the participants improve their behaviors in the facility. The participants talked about wanting to have good behavior so that gardening privileges were not taken away. For example, one participant reported: "Gardening also helps me with my anger. I was upset yesterday because one of my friends left. So, I went out and worked in the garden and I was happier." Many participants also discussed the "calming" effect gardening had on them.

A review of behavioral violations before and during the gardening project indicates participants received fewer and less severe behavior violation write-ups once enrolled in the gardening project. Because participants had to have appropriate behavior to participate in the gardening project, behavior violations for this group were already on the decline. However, prior to the start of the gardening project, participants had an average of 46 behavior write-ups (range 9-259); during the gardening project, participants had an average of 7.26 write-ups (range 0-28). Three participants had

no infractions after they began gardening. Ten of 19 participants received write-ups only for minor violations such as "untidiness" and "forgetfulness."

Interestingly and possibly related to the reduction in behavior violations, three participants also stated in their qualitative interviews that the gardening project helped their relationships with staff. Enhanced communication with staff, seeing that the staff "cared about me," and seeing a staff member as a "role model" were all mentioned as a benefit of working in the garden. The quantitative data also support this assertion: 73% of participants agreed or strongly agreed that they got along better with staff because of the gardening project.

Some youth also discussed how the lessons learned while gardening would help them at home. Several participants talked about how they wanted to garden when they returned home. It was not simply that they wanted to garden, but that the participants thought working in a garden with family or friends would improve relationships. One participant said: "I plan on starting my own gardening and having my friends help in it. I think I can be a good influence over my friends now and we can be productive in the garden." Several participants also talked about wanting to garden and continue to donate food when they returned home:

*It will make a difference in my community because I will continue to volunteer and will donate what I grow in my garden and will donate some of my compost to others that are starting a garden. It has kinda already helped at home because I started a decomposition pile when I was home on my 3-day visit.*

The second research question related to gardening, donating the food, and restitution. The staff at the juvenile rehabilitation center and the research team thought that having the youth donate the food to community agencies serving the hungry and also assist with the daily operations of the agency (e.g., restocking pantry shelves or serving food) added value to the gardening project. The authors and the rehabilitation center staff saw this as restitution. However, the participants did not articulate the relationship between their produce donations and restitution. Rather, the concept of developing empathy and liking to help others emerged. Over 95% of the participants reported that they agreed or strongly agreed that they felt good about



donating the food they had grown. In contrast, only 42% agreed or strongly agreed that donating the food made up for the trouble they caused by committing crime.

The researchers and the rehabilitation center staff think that the youth may not have seen their work as restitution for two reasons. First, the therapeutic component of the juvenile rehabilitation center focused on having youth take responsibility for their crimes. Youth clearly articulated that they were responsible for their behaviors. In some cases, several participants parroted the exact wording used in the treatment milieu, suggesting that they were simply repeating some of the therapeutic language they were being taught. As such, it is possible either that they did not internalize the concepts of responsibility or that the nuanced intersection between responsibility and restitution was missed by the youth.

This may have been further complicated by the youths' development as moral individuals. Based on Kohlberg's (1981) work on moral development, the youth in the study would be operating at the conventional reasoning level. At this level, a child understands the rules of the social order, but the understanding is based on external sources such as parents or police officers telling a child what is considered a moral behavior. The participants may have yet to develop the sophisticated moral reasoning required in the postconventional level, the stage at which individuals incorporate moral standards apart from self interest or authority. Appreciating the moral reasoning used when the court system imposes sanctions of restitution may not be fully realized until the youth mature.

However, the emergence of empathy as a developing social skill learned from the gardening project has implications for working with juvenile offenders. Lack of empathy is a characteristic of conduct disorder and its adult version, antisocial personality disorder (American Psychiatric Association, 2000), both of which are commonly diagnosed in criminal offenders (Drerup, Croysdale & Hoffmann, 2008; Hill & Nathan, 2008; Walters & Knight, 2010). Juvenile justice programs that foster the development of empathy may help offenders and the communities in which they live by potentially averting criminal behaviors. Robinson, Roberts, Strayer, and Koopman (2007) found that when shown a videotaped vignette that evoked an empathetic response, incarcerated youth responded with less empathy than the comparison group of peers without juvenile justice

involvement. Barriga, Sullivan-Cosetti, and Gibbs (2009) studied adjudicated delinquents following a 10-week empathy training program. They found that programming focused on empathy can help prevent anti-social behaviors and nurture the development of moral judgment maturity. The researchers and rehabilitation center staff in the current study believe that enhancing the gardening project by allowing the participants to deliver and serve the produce that they grew to pantries and community kitchens emphasized the value of their contribution in ways that the gardening alone would not have done. Further exploration of how gardening projects can help juvenile offenders develop empathetic thoughts and behaviors is warranted.

### **Limitations**

This study had several limitations. First, the sample size was small and limited to one program in southwestern Ohio. The sample was also predominately male and Caucasian. As a result, caution should be used when generalizing results. Second, only youth who were on a behavioral level appropriate to go outside and work with tools were allowed to participate in the garden, and thus the research project. It is possible that those who were eligible to garden were different than the general population of the juvenile rehabilitation center. Because their behavior was deemed 'appropriate,' the participants could have been more open to personal growth and change, had better social skills, or knew how to "work" the system. The participants could have been more amenable to any intervention; for example, it is possible that learning to paint may have produced similar results as gardening.

Finally, there were many variables outside the control of the researchers. For example, how often the participants gardened or the length of time of each gardening session were not controlled or counted. Juvenile rehabilitation center programming, staff coverage, and the weather determined if and when gardening was done. It is impossible with this research design to determine if there is an optimum amount of time spent gardening for positive outcomes. Another issue outside of the researchers' control was the number of youth eligible to garden. This factor limited sample size and made it impossible to complete some statistical analysis that may have produced interesting findings. One way to circumvent this methodological problem would be to work with larger or multiple facilities.

### **Recommendation for Practice and Research**

This formative research suggests that gardening is a useful program for youth detained in a juvenile rehabilitation center. Having a garden in the facility was attractive to staff and administration for several reasons. First, it was a low-cost programming option. Grants are available for youth gardening programs and costs were limited to approximately \$40 in seeds and supply purchases. Second, gardening was a physical activity that provided a form of exercise and recreation for the youth. One of the four elements of Hirschi's social control theory, involvement in legitimate activities (2002) suggests that if the youth are gardening, they cannot simultaneously be committing crime or getting in trouble. Similarly, if the youth were physically tired from gardening, they may have abstained from behavioral disruptions. Finally, the staff thought that the gardening skills could be helpful in future employment. Youth may identify interests that could translate into employment opportunities in agriculture, farming, or landscaping.

The participants identified ways in which the gardening project could be strengthened. Over 73% of participants agreed or strongly agreed that they wanted to garden when they returned home. One participant said: "I want to plant trees and start a garden with my family which I think will bring us closer." Based on this suggestion, programming could be implemented to invite the youths' families to garden. The clinical staff could work during family sessions to illustrate concepts of communication, cooperation, responsibility, and other family dynamics that occur during gardening. Participants could also be encouraged to start a family garden. This would provide youth and their families with a shared activity to engage in while on home visits, encourage a family activity that may aid in the transition from detention to the community, and promote healthier eating.

Another option would be for the treatment facility staff to work with local probation and parole departments in the community. Local departments could start community gardens that could be utilized by all youth involved in the juvenile justice system. For the youth transitioning from the locked facility to the community, the probation garden may provide a space for them to enjoy a recreational activity which is appropriate, further develop their interpersonal skills with peers, and allow a non-threatening way for probation officers to connect with the youth they monitor. The garden would benefit

the probation office by creating a project that provided meaningful community service opportunities for any youth sentenced to community service, while at the same time benefit local food pantries and community kitchens by providing fresh produce. Another less intensive option would be to include gardening resources and referrals as part of discharge planning.

Continued research is needed to determine the effects of gardening programs on juvenile offenders. Once the methodological flaws that were identified in the limitations section of this paper are addressed, future research could explore whether gardening had any impact on recidivism by following youth who participated in a gardening project and those who did not. Additional research is also needed to determine if gardening helps first time juvenile offenders in the same ways that it helps severe and chronic offenders.

It is also recommended that future researchers measure concepts of empathy development rather than the concept of restitution. Previous research suggests that the development of empathy in young offenders may be important in avoiding continued antisocial behavior (Robinson, Roberts, Strayer & Koopman, 2007; Barriga, Sullivan-Cosetti & Gibbs, 2009). Barriga et al. (2009) suggest that empathy training helps prevent antisocial behaviors and fosters the development of moral maturity. Based on this research, the juvenile rehabilitation center could design programming that more explicitly links the gardening project and food donations to the development of empathy. Including empathy training as part of the therapeutic milieu and incorporating the service that stems from the gardening project may provide real world experiences for youth to practice new empathy skills.

### **CONCLUSION**

Engaging juvenile offenders in prosocial activities can be a challenge. Financial and safety issues may constrain options. In this formative evaluation, participating in a gardening project while incarcerated in a juvenile rehabilitation center shows promise as a therapeutic intervention. The participants saw the gardening project as beneficial and fun. Youth felt that the gardening project helped them develop new skills. In the words of one participant, "Gardening is cool!" Given the small financial commitment, minimal risk to participants, interpersonal gains for the participants, and benefit of donated food for the community, efforts should be made to enhance and expand gardening in juvenile justice settings.

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The authors wish to thank Superintendent Gary Neidenthal and his staff for the dedication to the youth they serve and their commitment to the gardening project.