

## Creative Musical Expression as a Catalyst for Quality-of-life Improvement in Inner-city Adolescents Placed in a Court-referred Residential Treatment Program

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### ABSTRACT

**Background:** Obstacles to effectively rehabilitate inner-city adolescents in staff-secure residential treatment centers should not be underestimated. Effective evidence-based protocols are lacking to help juveniles who are often angry, detached, frustrated, and in direct conflict with their peers. Facing a myriad of issues ranging from youth delinquency offenses to trauma, abuse, drug/alcohol use, peer pressure/gang-related activities, lack of structure in home environments, mental health diagnoses, and cognitive functioning difficulties, these adolescents present extraordinary challenges to an over-stressed juvenile justice system.

**Material/methods:** A randomized controlled crossover study is utilized to comprehensively evaluate the effectiveness of a novel creative musical expression protocol as a catalyst for nonverbal and verbal disclosure leading to improvements in quality of life for inner-city youth in a court-referred residential treatment program. A total of 52 (30 females and 22 males) African-American, Asian, Caucasian, and Puerto Rican subjects ranging in age from 12 to 18 (mean age 14.5) completed the study.

**Results:** Dependent variable measures included the Child and Adolescent Functional Assessment Scale (CAFAS), the Adolescent Psychopathology Scale (APS), the Adolescent Anger Rating Scale (AARS), the Reynolds Adolescent Depression Scale, 2nd edition (RADS 2), and the Adolescent Visual-Analog Recreational Music Making Assessment (A-VARMMA). Statistically significant (experimental vs control) improvements in multiple parameters include school/work role performance, total depression, anhedonia/negative affect, negative self-evaluation, and instrumental anger. In addition, extended impact (experimental vs control) is characterized by statistically significant improvements 6 weeks after completion of the protocol, for school/work role performance, behavior toward others, anhedo-

nia/negative affect, total anger, instrumental anger, anger, and interpersonal problems.

**Limitations:** The primary limitations of this study include an extended follow-up period of only 6 weeks post completion of the protocol, and the inability to blind the counselors performing standardized assessments.

**Conclusions:** This study is the first of its kind to test a replicable creative musical expression protocol as a catalyst for nonverbal and verbal disclosure leading to improved quality of life for inner-city youth in a court-referred residential treatment program. With substantial potential for widespread dissemination, this innovative protocol for adolescents can be readily utilized by behavioral health professionals without prior musical experience.

Despite the extraordinary need to rehabilitate youth in court-referred residential treatment programs, a limited number of effective, replicable, evidence-based treatment strategies are supported by peer-reviewed research. The purpose of this randomized controlled study is to comprehensively evaluate the effectiveness of a creative musical expression protocol as a catalyst for youth nonverbal and verbal disclosure leading to improvements in school/work roles, community roles, behavior toward others, moods, and rational thought processes, as well as reduction of self-harm behaviors, feelings of alienation, anger, aggression, and interpersonal problems.

Within the adolescent population, the US Justice Department's Office of Juvenile Justice and Delinquency Prevention (OJJDP) statistics demonstrate a high percentage of youth delinquency offenses, accounting for 78% of all adolescents in residential treatment programs and 95% of all juvenile offenders.<sup>1</sup> Delinquency offenses are defined as behaviors that would be considered criminal violations for adults. Status offenses, identified as running away, truancy, ungovernability, curfew violations, and underage drinking behaviors constitute the remaining 5% of court-referred juveniles in residential treatment placements.<sup>1</sup>

Law enforcement agencies made 2.2 million arrests of persons under age 18 in 2003. The most serious charges in almost half of all these arrests were larceny-theft, simple assault, a drug abuse violation, disorderly conduct, or a liquor law violation. A greater proportion of female arrests (20%) than male arrests (15%) involved a person younger than age 18.<sup>1</sup>

Additionally, some adolescents in residential placement

programs are not charged with or adjudicated for such offenses but are committed for neglect, abuse, emotional disturbance, or parental referral. Specifically, in addition to normal adolescent issues, the challenges facing these youth include neglect, trauma (physical, sexual, or emotional abuse), drug/alcohol use or abuse, peer pressure/gang related activities, lack of structure in home environments, legal issues, mental health diagnoses, cognitive functioning difficulties/educational deficiencies, separation from family/significant others, and inadequate access to appropriate medical services. Furthermore, increasing numbers of youth are failing and dropping out of school, with educational deficits serving as the primary reason for entry into the juvenile justice system.<sup>2</sup>

According to OJJDP's *2006 National Report*, persons ages 7 to 17 are about as likely to commit suicide as they are to be victims of homicide. In most states, juvenile suicides are more common than juvenile homicides.

Crime is also an issue. One of every 4 victims of violent crime known to law enforcement is a juvenile, and most of these victims are female. More than one-third of juvenile victims of violent crime known to law enforcement are under age 12.

The burgeoning personal, community, and societal impact of these issues coupled with the escalating challenge and cost of providing effective services renders the need for developing effective rehabilitation programs a high priority.

## BACKGROUND

The use of creative arts interventions as tools for the rehabilitation of adolescents has been addressed by many researchers. Basso and Pelech explored the use of creative arts and play group therapy in a hospital-based summer program. The goals of these interventions were to increase participants' knowledge about their conditions, and to express normative feelings of anxiety, anger, and fear. While practical suggestions for initiating a creative arts program were presented, pre- and post-assessments were not conducted.<sup>3</sup>

Laiho presented a theoretical model of the psychological functions of music in adolescence. The model categorized psychological functions of music into 4 fields: interpersonal relationships, identity, agency, and emotionality, based on a theoretical synthesis of research from different disciplines. While this categorization focused on adolescent development and the psychological functioning of adolescents and their mental health, only a theoretical basis for more elaborate empirical investigations was presented.<sup>4</sup>

Wexler conducted a longitudinal study of inner-city children and adolescents who suffered life-long traumas and disabilities. Two case study examples of interventions from the Harlem Horizon Arts Studio (HHAS) that utilized individualized protocols for participants as well as for staff were presented. Outcomes were based on words and behaviors that served as the foundation of the data. From these studies, Wexler concluded that this method utilizing creative painting promotes emotional and physical healing by providing opportunities for self-expression and socialization.<sup>5</sup>

An additional research focus has been the identification of interventions effective in rehabilitating adolescents in the context of depression, anger, and emotional regulation. Gold assessed the value of an anger management protocol based upon eight 1-hour group sessions focused on discussions of various aspects of anger with 10 adolescents from an inpatient residential treatment setting. This study was designed with a pretest, structured intervention, and posttesting procedures that included both qualitative and quantitative measures. The authors perceived benefits to all 10 participants.<sup>6</sup> However, the small sample size and the lack of a control group rendered the study inconclusive.

Silk studied emotional regulation, depression, anger, and behavior problems in adolescents without a clear definition of causality, specific reproducible interventions, or significant outcomes. The study explored the relationship between emotional regulation and adolescent adjustment, including symptoms of depression, anxiety, behavior problems, and problematic drinking. Emotional regulation was assessed using the Experience Sample Method (ESM) that requires adolescents to self-report real-life emotional experiences.

Silk suggested that emotional regulation is an important correlate of behavioral and emotional problems among adolescents and that there may be a nonspecific emotional deregulation factor related to diverse forms of adolescent psychopathology and adjustment. The lack of emotional regulation is either a risk factor or a parallel feature of adolescent psychopathology that should be targeted in mental health prevention and intervention programs for the adolescent population.<sup>7,8</sup>

Unfortunately, due to the combined limitations of these studies, the need for replicable evidence-based protocols addressing depression, anger, and emotional regulation in adolescents is apparent.

Another research focus relates to the impact of interventions on school performance outcomes, interpersonal relationships, and self-esteem. Keisch noted that structured treatment approaches in schools are often not supported by research.<sup>9</sup> Taras completed a review of published studies on the association between physical activity among school-aged children and academic outcomes. Based on observations, the review suggested possible short-term improvements in areas such as concentration. Long-term improvements, however, were not well substantiated. Taras called for further research on the relationship between physical activity and academic outcomes.<sup>10</sup>

The effectiveness of school-based mentoring as a universal prevention strategy was evaluated by Portwood and colleagues.<sup>11</sup> The study examined the impact of a specific mentoring program on students with risk factors. Researchers used a pretest-posttest control group design with 170 students across 5 school districts across Kansas and Missouri and provided data—which delivered mixed results—on attitudes toward school, school connectedness, community connectedness, attitudes toward delinquency, self-esteem, self-concept, goal-setting, and attitudes toward adults. For example, the posttest revealed statistically significant differences between experimental and matched control group subjects in a sense of school membership defined

in the paper as “a higher sense of belonging to the school community.” Additionally, for mentored participants who had low scores at baseline, a statistically significant improvement in community connectedness and goal-setting was noted. No significant differences between experimental and control groups were noted in drug and alcohol use, attitudes toward drug and alcohol use, or commitment to abstinences.<sup>11</sup>

Keisch designed a quasi-experimental study of a specific intervention protocol with adolescents utilizing self-reported assessments and empirical data (Piers-Harris Children’s Self Concept Scale), attendance, discipline contracts, and grade point average without significant interpretable effects. The study examined the efficacy of the Girls’ Only Leadership Development (GOLD) preventative program on the self-esteem and school behaviors of adolescent girls.<sup>9</sup> Differences between the control group and experimental group were evaluated immediately following completion of the program and 5 to 6 months thereafter. While the results indicated that the conglomerate of school behaviors and self-esteem were significantly different for GOLD participants than nonparticipants 5 to 6 months after the program, no individual area of significance could be interpreted. Self-esteem for all participants improved regardless of initial levels, but data revealed that all girls had high self-esteem at the outset.<sup>9</sup>

Vitiello and Sherrill conducted a review of articles on school-based interventions for students with attention deficit hyperactivity disorder (ADHD), concentrating on areas of academic achievement and classroom deportment as indicated by factors such as teacher-student and peer relationships and disruptive classroom behaviors. The authors noted that research has been focused primarily on treatment effects in terms of symptom reduction rather than on functional outcomes.<sup>12</sup>

From a music therapy perspective, an extensive literature search revealed few significant, replicable, quantitative outcome-based investigations focusing on at-risk adolescents. Saroyan discussed the therapeutic value of music therapy as a treatment approach for adolescents hospitalized in a psychiatric facility as a means for enhancing group skills to increase self-esteem and trust among peers. This discussion, however, was not supported by a specific protocol, evaluation data, or reproducible outcomes. Saroyan suggested that music therapy should be enjoyable for participants and any means of evaluation should be avoided.<sup>13</sup>

Rickson conducted a pilot study of 15 subjects (aged 11-15 years) enrolled at a special residential school in New Zealand to determine if music therapy was effective in promoting prosocial behaviors in aggressive adolescent boys with social, emotional, and learning difficulties. Measures included parent and teacher versions of the Developmental Behaviour Checklist (DBC-P and DBC-T). While no definite treatment effects could be detected, the researchers suggested that a music therapy program promoting autonomy and creativity may help adolescents interact more appropriately with others in a residential villa setting but might also lead to a temporary mild increase in disruptive behavior in the classroom.<sup>14</sup>

In one notable 12-week study of 63 junior and senior high school students, groups using music therapy techniques and

cognitive behavioral therapy were compared to groups using cognitive behavioral therapy alone. Based on the Beck Depression Inventory and the Piers-Harris Self Concept Scale, Hendricks indicated that the additional use of music therapy techniques was positively correlated with reduced posttest depression scores and increased posttest self-concept scores for both junior high and senior high participants.<sup>15</sup>

With few exceptions as demonstrated above, limitations including inadequate empirical studies, single case evaluations, small sample size, and lack of reproducible outcomes fail to make a case for incorporating the aforementioned strategies into adolescent treatment programs focusing on improving quality of life, self-control, anger management, school performance, interpersonal relationships, and self-esteem.

Therefore the authors set forth to modify a specific Recreational Music Making (RMM) protocol that was supported by randomized, controlled peer-reviewed publications and that documented psychosocial, biological, and genomic changes in diverse populations. The term, *recreational* is derived from the Latin root, *recreatio*, which (according to the *Merriam-Webster Dictionary*) signifies “restoration to health.” RMM encompasses “enjoyable, accessible and fulfilling group music-based activities that unite people of all ages regardless of their challenges, backgrounds, ethnicity, ability or prior experience.”<sup>17</sup> RMM emphasizes personal expression, group support, and quality-of-life enhancement rather than mastery and performance.

The link between RMM and reduction of stress impact is supported by 5 published experimental investigations that utilized related protocols as effective biobehavioral modulators.<sup>16-20</sup> The first, incorporating normal subjects, revealed positive modulation of specific neuroendocrine and neuroimmune parameters in a direction opposite to that expected with the classic stress response.<sup>16</sup> The second and third documented cost-effective reductions of burnout elements (as determined by the Maslach Burnout Inventory) and Total Mood Disturbance (as determined by the Profile of Mood States) in an interdisciplinary long-term care workforce and in first year nursing students respectively.<sup>17,18</sup> The fourth study demonstrated biological modulation at the genomic level and reversal of genomic expression associated with stress induction.<sup>19</sup> The most recent publication (2007) presented biological evidence to demonstrate significant potential for RMM utilization in the corporate wellness environment.<sup>20</sup>

## METHODS

For the purposes of this study, adolescents and teens living at Bethesda Children’s Home, a staff-secure residential treatment facility in Meadville, Pennsylvania, were enlisted by random computer selection that excluded subjects likely to be discharged prior to completion of the protocol. Informed consents were signed in accordance with the Laws for Children in the Commonwealth of Pennsylvania Bulletin OMHSAS-01-04.

A total of 60 nonpaid participants began the protocol. Of these, 8 subjects were eliminated due to 2 or more absences resulting from illness, discharge, or physician appointments. A total of 52 (30 females and 22 males) African-American, Asian,

Caucasian, and Puerto Rican subjects ranging in age from 12 to 18 (mean age 14.5) completed the study with 99% attendance throughout the course of the 6-week program. This group consisted of participants with mental health disorders including but not limited to oppositional defiance disorder, posttraumatic stress disorder, separation anxiety, mood disorder, depression disorder, anxiety disorder, ADHD, parent/child relational disorder, conduct disorder, cognitive disorder, panic disorder, and substance/alcohol abuse. Of these participants, 23 reported past sexual abuse, 47 reported past abuse and neglect, and 36 had a history of school truancy.

Reasons for placement by a Children and Youth Services agency or a Juvenile Probation Department within the state of Pennsylvania included history of running away, out-of-control behavior, truancy, anger management, inappropriate sexual behavior, aggression, abuse/neglect, suicidal ideation, substance abuse, vandalism, and assault. Adolescents stay at Bethesda for a period of approximately 11 months and are then typically discharged to a family member.

Subjects were randomly assigned in accordance with a controlled crossover design (Table 1) to participate in an Adolescent *HealthRHYTHMS* drumming protocol (explained below). Intervention groups (6-12 participants) met with a trained facilitator at a designated time for a total of 6 consecutive weekly 1-hour sessions. During nonintervention periods, control subjects continued their normal structured routines that included therapeutic and educational programs focusing on current events, independent living, housing, social skills, grief and loss, health, drug and alcohol use, employment, sexual abuse/sexuality, anger management, and conflict resolution.

For group A, all surveys and assessments were completed prior to the first session, after the sixth session, and at week 12. For group B, all surveys and assessments were completed 6 weeks prior to the first session, immediately prior to the first session, and after the sixth session.

A trained RMM facilitator with 6 years of *HealthRHYTHMS* experience along with a masters-level counselor (cofacilitator) familiar with the subjects conducted each session in accordance with an adaptation of the previously published Adolescent *HealthRHYTHMS* drumming protocol.<sup>17</sup> This adapted version was modified to progressively introduce protocol steps and conditioning elements in accordance with degrees of trust and communication that progressively evolved within groups.<sup>17-19</sup> During initial sessions, the original *HealthRHYTHMS* protocol was altered to foster interest and acceptance by the group. Instruments included hand drums, a variety of auxiliary percussion instruments (bells, maracas, etc), and a Clavinova (a com-

puterized electronic keyboard).

The first session began with a brief welcome, a discussion of expectations, and an overview followed immediately by a 5- to 10-minute nonstructured jam session. Subjects were then asked to simply state their names and tap out the syllables on the drum. This step was progressively extended during subsequent sessions when participants were asked to play the name of someone they admired or loved.

The group then progressed to an entrainment activity—a short series of rhythmic exercises used to build focus, confidence, and group cohesiveness. Rather than attempting to master complex rhythms, subjects were invited to participate in a free-form manner without emphasis on mastery or performance.

As the primary focus of the protocol, a step referred to as *Inspirational Beats* afforded the opportunity for all participants to nonverbally express themselves on a drum in direct response to a designated series of 12 questions (2 questions/session over the 6 weeks). The first question was developed to inspire self-reflection, and the second was used to foster empathy and mutual respect. Both were intended to promote nonverbal and verbal disclosure (Table 2): After drumming a response, each subject was offered the opportunity to discuss his or her nonverbal musical responses. Rarely did subjects refuse to verbalize their rhythmic reflections. During sessions 4 through 6, after drumming their responses, subjects were also given the option for written disclosure prior to verbalization. Individual comments typically evolved into highly-charged group discussions moderated by the facilitator. The assignment presented at the end of this step was to put into practice insights gained from group discussions during the following week. Participants were given the opportunity to review their experiences the following week.

In subsequent sessions, an icebreaker activity was introduced immediately following the jam session. This component served to establish a lighthearted sense of teamwork and camaraderie.

Weeks 1-6	Weeks 7-12
Group A Intervention	Group A No intervention
Group B No intervention	Group B Intervention

**Table 2. Inspirational Beats: Each Session Included 2 Questions Presented in the Following Order**

1. The hardest thing for me to do is. . .
2. Reflect upon a moment when you were happiest.
3. What do you consider your best quality?
4. What do you find most admirable about another person in this group?
5. What seems out of control in your life?
6. What can you take control of that would make a positive difference in your life?
7. I admire honesty in others because. . .
8. A challenge I never expected helped me to. . .
9. I was right all along; people always. . .
10. I admire someone who. . .
11. An important goal I have developed is to. . .
12. When I recall the person I was at the first drum session and think of myself now, I realize. . .

Shakers were passed hand-to-hand from individual to individual. As the speed of transfer progressively and rhythmically accelerated to the point at which participants could not maintain the pace, shakers were subsequently dropped and laughter ensued.<sup>17</sup>

During session 3 and thereafter, prior to the shaker pass, a 5-minute structured wellness exercise was played on the Clavinova. Four integral elements (breathing, movement, music, and awareness) were emphasized as participants settled and followed a calming acoustical background.

In addition, during sessions 3 through 5, a tactile conditioning element (a plastic crystal purchased in a craft store that was green, clear or red) was distributed to each participant during a brief discussion of the session theme. The objective was to foster a heightened awareness of integrity, honesty, anger management, positive self-esteem, and improved choices for overall well-being. The clear crystal was linked to transparency and honesty, the green to an overall sense of calm, and the red to “stop and think” prior to spontaneously reacting to feelings of anxiety or anger. Green was used in session 3; clear in session 4; and red in session 5. In the sixth week, with the same goal of heightened awareness in mind, a small apple shaker was given with the intention to promote an awareness of nurturing one’s self with healthy choices.

For each week, the tactile object was linked to feelings repeatedly experienced and discussed in the group. Each session “theme” was woven into the wellness exercise. Subjects were asked to carry the objects at all times during the subsequent week as a reminder of the insights shared during the session. Most indicated that they did so on a regular basis. Instructions were to reach into one’s pocket, hold the item for a few moments, and reflect on the associated insight and feelings prior to spontaneously reacting to unsettling situations or challenges in a negative manner.

Each protocol step was supported by a brief discussion focusing on how to apply the lesson learned during the activity to real world situations. Sessions concluded by repeating the initial Clavinova wellness exercise with a focus on reinforcing session insights (Table 3).

### OUTCOME MEASURES

Dependent variable measures included the Child and Adolescent Functional Assessment Scale (CAFAS), the Adolescent Psychopathology Scale (APS), the Adolescent Anger Rating Scale (AARS), the Reynolds Adolescent Depression Scale, 2nd edition

(RADS 2), and the Adolescent Visual-Analog Recreational Music Making Assessment (A-VARMMA).<sup>21-24</sup>

The CAFAS documents residential staff members’ (unit counselors’) ratings of adolescents’ level of functioning in a variety of contexts including school/work role performance, home role performance, community role performance, behavior toward others, modulation of moods, self-harm behaviors, substance use, and ability to use rational thought processes.<sup>21</sup>

The APS is a self-report of psychosocial problems including self-concept, level of introversion, feelings of alienation and boredom, anger, aggression, interpersonal problems, emotional lability, disorientation, suicidal ideation, and level of social adaptation.<sup>22</sup>

The AARS is a self-report of anger expression including total levels of anger and differentiation between instrumental anger involving a delayed expression of emotion, including revenge or retaliation, reactive anger involving an immediate and impulsive expression of emotion, and anger control involving a more appropriate, proactive, and cognitively modified reaction to provocation.<sup>23</sup>

The RADS 2 is a self-report of depression symptoms including total level of depression, level of dysphoric mood, anhedonia and negative affect, negative self-evaluation, and somatic complaints.<sup>24</sup>

An additional measure included the Adolescent Visual Analogue Recreational Music Making Assessment (A-VARMMA) developed by the authors to document staff members’ ratings of subject participation during sessions. The A-VARMMA focuses on engagement, self-control, empathy, disclosure, and transcendence (moving past perceived obstacles) during each of the 6 sessions. The facilitator and cofacilitator, trained to observe the subjects through a series of comprehensive instructional sessions, completed A-VARMMA assessments for all participants immediately following each session.

The experimental protocol was reviewed/approved by the Institutional Review Board for Human Studies of Meadville Medical Center, Meadville, Pennsylvania.

### RESULTS

Data analysis included dependent *t*-tests comparing pretest and posttest measures for experimental and extended conditions, as well as independent *t*-tests comparing changes in experimental and extended groups to the control group.

Dependent *t*-test analysis indicated significant changes in experimental pretest/posttest measures including improvements in the CAFAS total adjustment ratings ( $P < .001$ ) and CAFAS subscales including school/work role performance ( $P < .001$ ), behavior toward others ( $P = .029$ ), and self-harm ( $P = .037$ ). RADS results indicated significant improvements in overall depression levels ( $P = .004$ ), anhedonia/negative affect ( $P = .018$ ), and negative self-evaluation ( $P = .005$ ). AARS analysis indicated significant improvements in levels of instrumental anger ( $P = .011$ ) and anger control ( $P = .047$ ). APS results demonstrated significant improvements in self-concept ( $P = .016$ ), anger ( $P = .026$ ), interpersonal problems ( $P = .007$ ), and disorientation ( $P = .047$ ) (Table 4).

Results also suggest that gains are maintained for a 6-week

**Table 3. Adolescent Health RHYTHMS Protocol (Weeks 3-6)**

Welcome jam session
Wellness exercise
Shaker pass
Rhythmic naming
Entrainment building
Inspirational Beats
Wellness exercise
Assignment

<b>Table 4. Dependent <i>t</i>-tests Comparing Pretest and Posttest Means for Experimental, Extended, and Control Groups With Standard Error in Parentheses), N=52</b>				
Subscale	Pretest Mean	Posttest Mean	% Change	<i>P</i>
<b>Child and Adolescent Functional Assessment Scale (CAFAS)</b>				
CAFAS total				
Experimental	73.27(4.22)	59.23(4.29)	19.2	<.001*
Extended	76.43(5.64)	53.57(6.00)	29.9	<.001*
Control	80.83(6.31)	69.58(6.38)	13.9	.018*
<b>School/work role performance</b>				
Experimental	14.81(1.52)	10.38(1.40)	29.9	<.001*
Extended	15.36(2.09)	8.93(1.49)	41.9	.002*
Control	13.33(1.87)	14.17(2.25)	-6.3	.357**
<b>Home role performance</b>				
Experimental	18.46(1.41)	16.92(1.68)	8.3	.179
Extended	17.86(1.95)	15.71(2.32)	12.0	.203
Control	19.58(2.29)	19.17(2.08)	2.1	.407
<b>Community role performance</b>				
Experimental	4.62(1.15)	3.65(1.13)	20.8	.161
Extended	5.36(1.74)	3.21(1.74)	40.0	.103
Control	6.25(2.07)	3.75(1.45)	40.0	.114
<b>Behavior toward others</b>				
Experimental	13.85(.92)	11.92(1.03)	13.9	.029*
Extended	13.21(1.37)	9.64(1.20)	27.0	.003*
Control	15.00(1.35)	14.58(1.20)	2.8	.373
<b>Mood</b>				
Experimental	12.69(1.03)	11.15(1.05)	12.1	.093
Extended	11.79(1.37)	11.07(1.39)	6.1	.351
Control	12.92(1.53)	13.75(1.57)	-6.5	.269**
<b>Selfharm</b>				
Experimental	2.69(.99)	1.15(.52)	57.1	.037*
Extended	3.57(1.72)	1.79(1.04)	50.0	.153
Control	4.58(1.80)	1.67(.78)	63.6	.055
<b>Substance use</b>				
Experimental	4.23(1.21)	3.27(1.02)	22.7	.202
Extended	5.36(1.74)	1.79(.90)	66.7	.019*
Control	7.50(2.27)	2.92(1.65)	61.1	.006*
<b>Thinking</b>				
Experimental	1.73(.71)	0.96(.41)	44.5	.080
Extended	3.57(1.28)	1.43(.85)	60.0	.042*
Control	1.67(.98)	0.00(0.00)	100.0	.052
<b>Reynolds Adolescent Depression Scale, 2nd edition (RADSD)</b>				
<b>Depression total</b>				
Experimental	54.87(1.80)	51.50(1.43)	6.1	.004*
Extended	52.86(2.09)	50.04(2.15)	5.3	.105
Control	56.08(2.81)	57.21(3.03)	-2.0	.273**

<b>Table 4 continued. Dependent <i>t</i>-tests Comparing Pretest and Posttest Means for Experimental, Extended, and Control Groups With Standard Error in Parentheses), N=52</b>				
Subscale	Pretest Mean	Posttest Mean	% Change	<i>P</i>
<b>Dysphoric mood</b>				
Experimental	52.48(1.69)	50.25(1.39)	4.3	.052
Extended	51.21(2.15)	48.86(1.92)	4.6	.131
Control	53.13(2.48)	53.96(2.68)	-1.6	.339**
<b>Anhedonia/negative affect</b>				
Experimental	55.60(1.43)	52.77(1.06)	5.1	.018*
Extended	54.39(1.61)	50.61(1.15)	7.0	.032*
Control	54.13(2.08)	57.00(2.47)	-5.3	.031**
<b>Negative self-evaluation</b>				
Experimental	54.65(1.75)	51.42(1.63)	5.9	.005*
Extended	52.64(2.32)	50.96(2.13)	3.2	.225
Control	56.08(2.56)	57.00(2.64)	-1.6	.329**
<b>Somatic complaints</b>				
Experimental	51.94(1.70)	50.33(1.51)	3.1	.130
Extended	50.39(2.24)	48.36(2.15)	4.0	.194
Control	55.54(2.56)	53.75(2.59)	3.2	.199
<b>Adolescent Anger Rating Scale (AARS)</b>				
<b>Total anger</b>				
Experimental	55.77(1.44)	55.06(1.95)	1.3	.357
Extended	55.36(2.05)	51.96(2.03)	6.1	.054
Control	54.67(1.19)	56.25(2.04)	-2.9	.152**
<b>Instrumental anger</b>				
Experimental	54.29(1.39)	51.44(1.36)	5.2	.011*
Extended	53.75(1.95)	50.36(1.94)	6.3	.010*
Control	52.13(1.54)	54.92(2.02)	-5.4	.037**
<b>Reactive anger</b>				
Experimental	53.67(1.60)	52.71(1.51)	1.8	.276
Extended	53.64(2.19)	50.04(2.06)	6.7	.081
Control	55.96(1.77)	53.67(2.40)	4.1	.132
<b>Anger control***</b>				
Experimental	45.42(1.39)	47.62(1.21)	-4.8	.047*
Extended	45.39(1.71)	46.18(2.20)	-1.7	.360
Control	46.00(1.34)	44.50(1.74)	3.3	.207**
<b>Adolescent Psychopathology Scale (APS)</b>				
<b>Self-concept</b>				
Experimental	55.10(1.46)	52.50(1.45)	4.7	.016*
Extended	55.43(1.84)	54.29(1.71)	2.1	.248
Control	54.21(2.58)	54.71(2.37)	-0.9	.404
<b>Introversion</b>				
Experimental	57.31(1.40)	58.08(1.26)	-1.3	.267
Extended	56.43(1.76)	58.64(1.92)	-3.9	.180
Control	58.29(1.81)	58.33(2.27)	-1	.491

**Table 4 continued. Dependent *t*-tests Comparing Pretest and Posttest Means for Experimental, Extended, and Control Groups With Standard Error in Parentheses), N=52**

Subscale	Pretest Mean	Posttest Mean	% Change	<i>P</i>
<b>Alienation-boredom</b>				
Experimental	57.90(1.46)	57.06(1.12)	1.5	.285
Extended	56.46(1.94)	54.68(1.71)	3.2	.166
Control	57.92(1.75)	59.58(2.20)	-2.9	.258**
<b>Anger</b>				
Experimental	56.42(1.75)	52.79(1.64)	6.4	.026*
Extended	55.46(2.45)	48.36(2.10)	12.8	.002*
Control	58.42(2.30)	57.54(2.53)	1.5	.329
<b>Aggression</b>				
Experimental	56.42(1.95)	55.48(2.16)	1.7	.328
Extended	54.54(2.37)	53.75(2.54)	1.4	.390
Control	57.33(2.77)	58.63(3.20)	-2.3	.285**
<b>Interpersonal problems</b>				
Experimental	58.27(1.72)	53.44(1.67)	8.3	.007*
Extended	57.54(2.43)	50.18(2.32)	12.8	.003*
Control	58.79(2.36)	59.13(2.45)	-.6	.443**
<b>Emotional lability</b>				
Experimental	54.75(1.68)	52.40(1.61)	4.3	.053
Extended	54.25(2.28)	49.89(2.23)	8.0	.032*
Control	54.92(2.36)	55.33(2.53)	-.8	.428**
<b>Disorientation</b>				
Experimental	52.54(1.47)	50.15(1.56)	4.5	.047*
Extended	52.86(2.04)	47.36(2.07)	10.4	.010*
Control	55.13(2.11)	52.17(2.17)	5.4	.109
<b>Suicide</b>				
Experimental	54.62(1.69)	52.27(1.51)	4.3	.070
Extended	54.64(2.40)	52.57(2.19)	3.8	.182
Control	54.21(2.81)	54.58(2.41)	-.7	.451**
<b>Social adaptation</b>				
Experimental	59.62(1.50)	60.98(1.55)	-2.3	.200
Extended	57.50(1.89)	61.00(2.35)	-6.1	.078
Control	62.54(2.06)	62.08(2.33)	.7	.428**
* Statistically significant results in accordance with .05 <i>P</i> values				
** Indicates change (statistically or nonstatistically significant) in a direction opposite to the expected experimental effect in control subjects				
*** Increased score indicates improvement				

period after completion of the intervention in overall CAFAS ratings ( $P<.001$ ) and CAFAS subscales including school/work role performance ( $P=.002$ ) and behavior toward others ( $P=.003$ ). Results also indicated that gains are maintained in RADS levels of anhedonia/negative affect ( $P=.032$ ); AARS levels of instrumental anger ( $P=.010$ ); and APS subscales including anger ( $P=.002$ ), interpersonal problems ( $P=.003$ ), and disorientation ( $P=.010$ ) (Table 4).

When experimental changes are compared to control group changes, independent *t*-test analysis indicated significant differences in CAFAS ratings of school/work role performance ( $P=.015$ ); RADS levels of total depression ( $P=.022$ ), anhedonia/negative affect ( $P=.005$ ), and negative self-evaluation ( $P=.036$ ); and AARS levels of instrumental anger ( $P=.004$ ). Results comparing extended pretest/posttest changes to control group changes indicate 6 weeks of maintained improvements in CAFAS school/work role performance ( $P=.010$ ) and behavior toward others ( $P=.037$ ). Additional results indicate maintained improvements in RADS anhedonia/negative affect ( $P=.005$ ); AARS levels of total anger ( $P=.031$ ) and instrumental anger ( $P=.002$ ); and APS anger ( $P=.025$ ) and interpersonal problems ( $P=.014$ ) (Table 5).

Individual session A-VARMMA ratings on a scale of 0 to 3 were analyzed using a repeated measures of analysis of variance (ANOVA) comparing changes in the mean across 6 sessions. Results indicate statistically significant changes in all subscales across the 6 sessions ( $P<.0001$ ) (Figure 1, Table 6).

## DISCUSSION

Based upon this comprehensive, controlled, randomized, crossover study of adolescent inner-city youth, these data for the first time demonstrate statistically significant improvements (experimental vs control) in school/work role performance, total depression, anhedonia/negative affect, negative self-evaluation, and instrumental anger (Table 5). In addition, extended impact (experimental vs control) characterized by statistically significant improvements 6 weeks after completion of the protocol was noted for school/work role performance, behavior toward others, anhedonia/negative affect, total anger, instrumental anger, anger, and interpersonal problems (Table 5).

Of importance is the consistency of findings across scales reflecting not only self-reports but also documentation by counselors. Furthermore, it must be emphasized that in addition to the statistically significant data noted above, findings clearly suggest far-greater real-world significance based upon the fact that the control group actually worsened in the context of multiple measures, including school/work role performance, total depression, dysphoric mood, anhedonia/negative affect, negative self-evaluation, total anger, instrumental anger, reactive anger, self-concept, alienation/boredom, aggression, interpersonal problems, emotional lability, and suicide (Table 4).

Based upon a number of peer-reviewed published scientific studies, recreational music-making has been shown to improve mood states; reduce employee turnover; and diminish the impact of stress on psychosocial, biological, and genomic levels.<sup>16-20</sup> This controlled crossover study presents compelling original data suggesting that this specific creative musical expression protocol has significant potential for enabling at-risk youth to effectively move beyond their perceived obstacles, work together harmoniously, and ultimately improve the quality of their lives.

The challenges of rehabilitating at-risk inner-city youth must not be underestimated. Angry, frustrated, and often violent, it is not surprising that these adolescents and teens experience a great deal of difficulty adjusting to judicial placement.

<b>Table 5. Independent <i>t</i>-tests Comparing Mean Experimental and Extended Changes to Control Group Changes With Standard Error in Parentheses, N=52</b>				
Subscale	Exp/Ext Change	Control Change	% Change	<i>P</i>
<b>CAFAS</b>				
<b>CAFAS Total</b>				
Experimental	14.04(3.95)	11.25(5.05)	19.9	.341
Extended	22.86(5.46)	11.25(5.05)	50.8	.065
<b>School/work role performance</b>				
Experimental	4.42(1.24)	-.83(2.25)	118.8	.015*
Extended	6.43(2.01)	-.83(2.25)	113.0	.010*
<b>Home role performance</b>				
Experimental	1.54(1.66)	.42(1.75)	72.9	.340
Extended	2.14(2.54)	.42(1.75)	80.6	.295
<b>Community role performance</b>				
Experimental	.96(.96)	2.50(2.02)	-160.0	.218
Extended	2.14(1.66)	2.50(2.02)	-16.7	.445
<b>Behavior toward others</b>				
Experimental	1.92(.99)	.42(1.27)	78.3	.189
Extended	3.57(1.17)	.42(1.27)	88.3	.037*
<b>Mood</b>				
Experimental	1.54(1.15)	-.83(1.33)	154.2	.110
Extended	.71(1.85)	-.83(1.33)	216.7	.257
<b>Self-harm</b>				
Experimental	1.54(.84)	2.92(1.75)	-89.6	.212
Extended	1.79(1.71)	2.92(1.75)	-63.3	.324
<b>Substance use</b>				
Experimental	.96(1.14)	4.58(1.70)	-376.7	.040*
Extended	3.57(1.64)	4.58(1.70)	-28.3	.336
<b>Thinking</b>				
Experimental	0.77(.54)	1.67(.98)	100.0	.194
Extended	2.14(1.19)	1.67(.98)	22.2	.382
<b>RADS</b>				
<b>Depression total</b>				
Experimental	3.37(1.21)	-1.13(1.84)	133.4	.022*
Extended	2.82(2.20)	-1.13(1.84)	139.9	.091
<b>Dysphoric mood</b>				
Experimental	2.23(1.35)	-.83(1.98)	137.4	.103
Extended	2.36(2.06)	-.83(1.98)	135.4	.137
<b>Anhedonia/negative affect</b>				
Experimental	2.83(1.31)	-2.88(1.46)	201.7	.005*
Extended	3.79(1.97)	-2.88(1.46)	175.9	.005*
<b>Negative self-evaluation</b>				
Experimental	3.23(1.22)	-.92(2.05)	128.4	.036*
Extended	1.68(2.19)	-.92(2.05)	154.6	.198
<b>Somatic complaints</b>				
Experimental	1.62(1.42)	1.79(2.08)	-10.9	.472
Extended	2.04(2.32)	1.79(2.08)	12.0	.469

<b>Table 5 continued. Independent <i>t</i>-tests Comparing Mean Experimental and Extended Changes to Control Group Changes With Standard Error in Parentheses, N=52</b>				
Subscale	Exp/Ext Change	Control Change	% Change	<i>P</i>
<b>AARS</b>				
<b>Total anger</b>				
Experimental	.71(1.94)	-1.58(1.50)	322.5	.226
Extended	3.39(2.04)	-1.58(1.50)	146.7	.031*
<b>Instrumental anger</b>				
Experimental	2.85(1.21)	-2.79(1.49)	198.1	.004*
Extended	3.39(1.36)	-2.79(1.49)	182.3	.002*
<b>Reactive anger</b>				
Experimental	.96(1.60)	2.29(2.00)	-138.3	.314
Extended	3.61(2.50)	2.29(2.00)	36.5	.345
<b>Anger control***</b>				
Experimental	-2.19(1.29)	1.50(1.80)	168.4	.053
Extended	-.79(2.17)	1.50(1.80)	290.9	.215
<b>APS</b>				
<b>Self-concept</b>				
Experimental	2.60(1.18)	-.50(2.04)	119.3	.084
Extended	1.14(1.65)	-.50(2.04)	143.8	.265
<b>Introversion</b>				
Experimental	-.77(1.23)	-.04(1.88)	94.6	.372
Extended	-2.21(2.37)	-.04(1.88)	98.1	.243
<b>Alienation-boredom</b>				
Experimental	.85(1.48)	-1.67(2.53)	297.0	.184
Extended	1.79(1.81)	-1.67(2.53)	193.3	.131
<b>Anger</b>				
Experimental	3.63(1.83)	.88(1.95)	75.9	.181
Extended	7.11(1.95)	.88(1.95)	87.7	.025*
<b>Aggression</b>				
Experimental	.94(2.10)	-1.29(2.24)	237.1	.259
Extended	.79(2.79)	-1.29(2.24)	264.4	.286
<b>Interpersonal problems</b>				
Experimental	4.83(1.91)	-.33(2.31)	106.9	.057
Extended	7.36(2.43)	-.33(2.31)	104.5	.014*
<b>Emotional lability</b>				
Experimental	2.35(1.42)	-.42(2.28)	117.8	.146
Extended	4.36(2.26)	-.42(2.28)	109.6	.073
<b>Disorientation</b>				
Experimental	5.25(2.11)	2.96(2.33)	-24.1	.257
Extended	7.14(2.75)	2.96(2.33)	46.2	.130
<b>Suicide</b>				
Experimental	2.35(1.57)	-.38(3.00)	116.0	.189
Extended	2.07(2.25)	-.38(3.00)	118.1	.255
<b>Social adaptation</b>				
Experimental	-1.37(1.61)	.46(2.50)	72.5	.267
Extended	-3.50(2.40)	.46(2.50)	89.3	.130

\* Statistically significant results in accordance with .05 *P* values  
 \*\*\* Increased score indicates improvement



With histories of running away, out-of-control behavior, truancy, anger management problems, inappropriate sexual behavior, aggression, abuse/neglect, suicidal ideation, substance abuse, vandalism, and assault, confinement in a regimented treatment center signifies another failure for most youth. To compound these issues, despite program initiatives designed for positive socialization coupled with obvious commonalities shared by these youth, many are prone to overt conflict and frustration with their peers rather than building mutually supportive social structures. Anger and alienation tend to interfere with introspection, personal growth, and team-building, thus compounding the impact of antecedent issues and ultimately undermining successful psychosocial rehabilitation. The results of this study support the need for effective evidence-based group strategies that foster a sense of personal value, acceptance, and peer-to-peer support.

This study is the first to investigate a special adaptation of the previously published Clavinova-assisted *HealthRHYTHMS* protocol that, in its original form, was not considered appropriate for this group. Self-control, empathy, and willingness to participate serve as fundamental core requisites of the original protocol. The dissonant nature of this study population coupled with lack of self-control and initial indifference to and conflict with others prompted the resultant adaptation that progressively evolves over 3 sessions to closely resemble the original protocol. During early sessions, the facilitator attempts to progressively win over the group and strives to model an environment of support, safety, and mutual acceptance. As demonstrated by A-VARMMA observer ratings, statistically significant positive trends in engagement, self-control, empathy, disclosure, and transcendence progressively evolved over successive sessions (Table 6, Figure 1).

The sequential strategy utilized in this 6-session protocol consists of 4 unique objectives: 1) creating a safe and supportive environment that allows each person to be heard and acknowledged; 2) enabling nonpressured creative musical expression that reflects individual as well as group strengths; 3) inspiring nonverbal disclosure as a catalyst for self-reflection and verbal disclosure; and, finally, 4) processing that disclosure to build

self-esteem, respect, and acceptance. These elements coupled with the overall conditioning strategy utilized to reinforce session insights create opportunities that can ultimately lead to positive regard for each group member. During the course of 6 weeks, individual and group transformation became readily apparent as a shared sense of personal worth, empathy, tolerance, responsibility, acceptance, and camaraderie replaced antipathy, resentment, fear, anger, conflict, self-deprecation, and solitude.

It must be emphasized that disciplinary rules were precisely stated and reiterated during initial sessions. Participants might be asked to sit outside the group for failure to maintain self-control such as disruptive behavior or lack of respect for others. Rarely did this occur more than once in a group since sessions often become considered valued enjoyable activities as evidenced by 99% attendance.

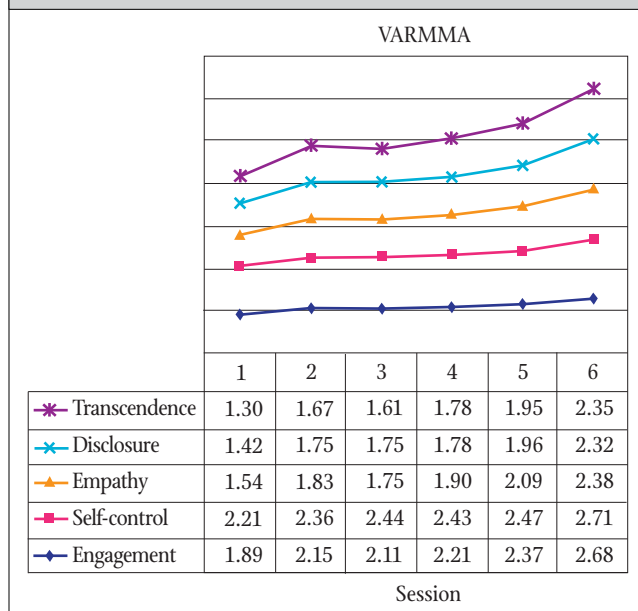
Progress toward mutual respect and cooperation do not occur at the same rate for each individual. For some participants, progress steadily evolves and momentum builds with each session. For others, seemingly little change is evident early on, and then a breakthrough suddenly occurs based upon meaningful disclosure that immediately transforms the person and the group. In most cases, disclosure and subsequent processing herald an immediate awareness of one's ability to move past a seemingly insurmountable obstacle. While such occurrences are not infrequent, each transcendent moment is unique in context, scope, and power.

Disclosure, as originally described by James Pennebaker and detailed in his research, is the process of effectively expressing and confronting one's deepest thoughts and feelings.<sup>25</sup> He recognized that the process of actively holding back or inhibiting one's thoughts and feelings could gradually undermine the body's defenses and has been associated with long-term stress and disease. Pennebaker asserted that while inhibition is potentially harmful, disclosure can have remarkable short-term and long-term effects. Actively confronting upsetting experiences can reduce the negative effects of inhibition.<sup>26</sup> Results of random effects analyses indicate that experimental disclosure is effective, with a positive and significant average r-effect size of .075.<sup>27</sup>

**Table 6. Adolescent Visual Analogue Recreational Music-Making Assessment (A-VARMMA): Subscale Means and Percentage Change Across 6 Sessions**

Subscale	1	2	3	4	5	6	Overall Change
Transcendence mean	1.30	1.67	1.61	1.78	1.95	2.35	1.05
Percentage increase		28.5%	-3.6%	10.6%	9.6%	20.5%	80.8%
Disclosure mean	1.42	1.75	1.75	1.78	1.96	2.32	.90
Percentage increase		23.2%	0.0%	1.7%	10.1%	18.4%	63.4%
Empathy mean	1.54	1.83	1.75	1.90	2.09	2.38	.84
Percentage increase		18.8%	-4.4%	8.6%	10.0%	13.9%	54.5%
Self-control mean	2.21	2.36	2.44	2.43	2.47	2.71	.5
Percentage increase		6.8%	3.4%	-.4%	1.7%	9.7%	22.6%
Engagement mean	1.89	2.15	2.11	2.21	2.37	2.68	.79
Percentage increase		13.8%	-2.3%	4.7%	7.2%	13.1%	41.8%

**Figure 1. Adolescent Visual Analogue Recreational Music-Making Assessment (A-VARMMA): Subscale Means Across 6 Sessions**



While Pennebaker’s primary focus was written disclosure, he recognized that expressive arts could potentially serve to strip away inhibitions and other defenses. He noted that nonlanguage-based therapies ultimately rely heavily on language once the client’s inhibitions are lifted.<sup>25</sup>

In accordance with Pennebaker’s findings, the authors support the notion that creative musical expression (nonverbal disclosure in direct response to the specific questions presented to the group) can serve as an effective catalyst for verbal disclosure. The authors contend that creative musical disclosure serves as a rather effective personal release enabling an individual to subsequently verbally express what heretofore may have seemed inexpressible.

The value of disclosure is perhaps best articulated by the late Fred Rogers who stated, “It is only natural that we and our children find many things hard to talk about. But anything human is mentionable and anything mentionable can be manageable. The mentioning can be difficult, and the managing too, but both can be done if we’re surrounded by love and trust.”<sup>28</sup>

Rogers’s insight clearly ties the word *mentionable* to the word *manageable*. It is not surprising that for these adolescents, pent up and often unexpressed guilt, shame, and blame associated with traumatic life experiences tend to inhibit meaningful communications, relationships, and a sense of hope for a better tomorrow.

The following brief examples demonstrate the impact of meaningful disclosure. During one charged session, in response to the question, “What seems out of control in your life?,” a shy adolescent beat her drum intensely then suddenly paused and lowered her head. She looked up and in a low, muffled voice shared that her uncle had sexually abused her on a regular basis. Several seconds of silence were broken by another group member who began to cry and stated that she had a similar experience. Both girls hugged each other. What followed was even more moving. In a comforting tone, a young boy commented, “I

can’t possibly understand how deeply that hurt you, but I’m truly sorry it happened.”

Another example centers on an adolescent whose first group contribution was a violent slam on the gathering drum that immediately brought to mind “a gunshot in the hood.” Over the course of the following weeks, he remained stoic, angry, and frustrated. His overt sense of detachment was readily apparent. The following week he put down the mallet, placed his hands on the drum, and began to express a sense of “running away.” During the next session his completion of the following sentence shocked the group: “The hardest thing for me to do is. . . be more tolerant of others and not come on so strong.” The group immediately recognized that something had changed, and they complimented him. Thereafter, he became a meaningful contributor to the group. A few months after discharge, the center received a call from the principal of the school he attended, who said, “I don’t know what happened there at your facility, but he is a changed young man. He attends school every day, studies hard, plays basketball, and is planning a future. Whatever took place there transformed him and gave him hope.”

The following comments are examples of written sentence completions that were shared with the group immediately following musical disclosure:

- A challenge I never expected helped me to. . .
- *live. I’m going to school and getting good grades. I feel like a human being.*
- *appreciate the small things in life, to stay focused and appreciate each day I’m here.*
- An important goal I have developed is to. . .
- *control myself and not to internalize my anger and my sadness and say, “self, I love you always, self.”*
- *learn how to have patience, learn to treat people with respect, learn to always have a hand to help someone with and know that I will always be here for someone to lean on.*
- When I recall the person I was at the first drum session and think of myself now, I realize. . .
- *that even though I have been through so much I am capable to do anything that I put my mind to. I know that I’m not a failure. I am smart, pretty and nice with a lot of confidence.*
- *I should not treat everyone with hatred. I can forgive and I know someone loves me. It’s okay to cry. I know the choices I make will lead me to my destiny. I know I’m someone now.*

As demonstrated by the above disclosure examples, data analysis alone cannot reflect the overall impact of the study. Furthermore, it must be emphasized that the unique manner in which self-reflection is shared and processed by each person and group is far more difficult to characterize. Some sessions proceed in an orderly and semipredictable manner, while others present unique challenges or unanticipated eruptions often tempered by incidents, conflicts, or disappointments. It is, however, well recognized that disruption often serves as a powerful catalyst for personal and group transformation. To an outside observer, however, 2 trends are readily apparent: anger that often dominates initially tends to progressively dissipate as

sessions ensue, and introspection ultimately becomes supported by group processing.

In this context, reactive anger and instrumental anger are worthy of further exploration: Reactive anger involves an immediate and impulsive expression of emotion; instrumental anger describes a delayed expression of emotion including revenge or retaliation.<sup>23</sup> Instrumental anger can be far more unnerving due to seemingly unpredictable explosions (ie, Columbine High School) that often lead to serious consequences and setbacks. It is important to note that both types of anger are often demonstrated by this adolescent population. Based on our statistically significant findings, both reactive anger and instrumental anger clearly diminished in a manner that extends at least 6 weeks beyond the last session.

The rationale for utilizing this adolescent protocol includes acceptance built upon the ubiquitous nature and enjoyment of music within respective cultures; the natural ease of personal rhythmic expression without the challenges of a steep learning curve; a sense of personal and group ownership and reward based upon individual expression without the imposition of conformity; and the potential to facilitate entrainment, engagement, and ultimately group bonding even in the face of diversity.

Prior to instituting this program, one must consider practical issues such as accessibility, affordability, and sustainability. While many interventions are not appropriate for individuals facing a myriad of emotional, cognitive, or learning challenges, this protocol is suitable for the majority of adolescents who are afforded the opportunity to participate at their own level. In terms of cost, the minimal investment in instruments (considering long-term use) and the ability to train onsite staff facilitators rather than hiring outside consultants render the program affordable from the onset, even without projecting potential cost-savings associated with participant and societal impact. Previously published research demonstrating considerable potential economic impact related to diminished long-term care employee burnout and turnover provides additional justification for beginning the program in challenging rehabilitation settings.<sup>17</sup> Ultimately, the prospect of sustainability must be factored into the analysis. This program progressively becomes more valuable as a tool for the positive transformation of an institutional culture that nurtures both adolescents and staff. It should be noted that the Bethesda management team participated in a 6-week facilitated program prior to formally initiating this study.

The authors recognize a number of caveats that must be considered prior to initiating this protocol:

- Foremost, program steps must be precisely introduced in accordance with the specified schedule. As an example, based on extensive experience derived from the process of initially developing the protocol, introducing the disclosure step prior to establishing a sense of safety, rapport, self-control, and tolerance, is tantamount to failure.
- Additionally, one must recognize the pivotal role of the facilitator. This individual must be willing to guide rather than teach and strive to foster a sense of discovery rather

than providing answers. A cofacilitator explicitly familiar with the population is highly recommended.

- To reduce feelings of resentment among participants, session and assessment scheduling requires careful consideration and should not compete with breaks or leisure time activities.
- Finally, it must be emphasized that participants are always prioritized over protocol, ie, at times, extended discussions must take precedence over completing a subsequent step.

The ultimate value of this protocol is its potential for widespread utilization as a clinical tool. Behavioral health professionals without prior musical experience can be readily taught to utilize this protocol within their armamentarium of effective group-based strategies for adolescent populations.

## LIMITATIONS

In practical terms, the limitations of this study include the utilization of a single rather than multiple facilitation teams, a protocol of just 6 sessions over 6 weeks, a limited extended follow-up period (6 weeks postcompletion of the protocol), and the inability to blind the counselors performing standardized assessments.

## FUTURE STUDIES

Future investigations should include multiple facilitators to determine whether or not measurable differences can be correlated with various facilitation approaches and levels of experience. It is suggested, however, that a single facilitator/cofacilitator team be assigned to each group since the evolving relationship with participants may serve as a significant determinant of group cohesiveness and outcomes.

Based upon multiple factors including the desire expressed by participants to continue the program, future sessions should extend sessions beyond 6 weeks whenever possible. The authors support the notion that offering the protocol over a longer course (yet to be determined) could potentially yield greater benefits. Of concern is the fact that this youth population does not begin treatment at a specific time—placement occurs erratically throughout the year.

It must also be emphasized that the integrity of an established group may ultimately serve as an important determinant of success. Allowing a new adolescent to join an established cohesive group could negatively impact program outcomes. While challenging from a scheduling perspective, one should consider subject selection in the context of a longer protocol duration and more extended follow-up that would likely enable most participants to complete the program. Of note is a similar research investigation presently underway that extends weekly over an entire school year for a more stable, less transitory population in a middle school environment.

## CONCLUSIONS

The prospect of effectively rehabilitating inner-city adolescents in staff-secure residential treatment centers is difficult at best. The marked range of youth delinquency offenses coupled

with the ongoing impact of neglect, trauma, abuse, drug/alcohol use, peer pressure–related/gang-related activities, lack of structure in home environments, mental health diagnoses, and cognitive functioning difficulties present extraordinary challenges to an overburdened juvenile justice system.

This study is the first of its kind to test a replicable creative musical expression protocol as a catalyst for nonverbal and verbal disclosure leading to improved quality of life for inner-city youth in a court-referred residential treatment program. While numerous statistically significant sustainable improvements have been documented 6 weeks after program completion, further research is clearly warranted.

This investigation represents a meaningful step toward enabling adolescents to build self-control, self-esteem, respect, empathy, and tolerance for others. With substantial potential for widespread utilization by behavioral health professionals without prior musical experience, this strategy that can save a child, transform a community, and positively impact society justifies ongoing exploration.

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