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Exercise and childhood acting out behaviors

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EXERCISE AND CHILDHOOD ACTING OUT BEHAVIORS

A Thesis

Presented to

the Faculty of the Department of Psychology

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In Partial Fulfillment

of the Requirements for the Degree

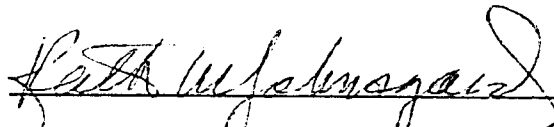
Master of Arts

By

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December, 1990

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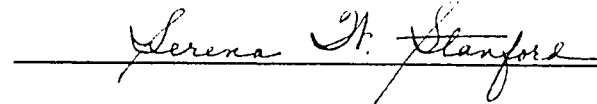


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ABSTRACT

EXERCISE AND CHILDHOOD ACTING OUT BEHAVIORS

by Lucie Thole Hemmen

Frequency of acting out behaviors was measured in a population of emotionally disturbed children in a residential facility who were exposed to both exercise and non-exercise activity therapy. Since previous research has associated many positive physical and psychological side effects with exercise, it was hypothesized that the frequency of acting out behaviors would measurably decrease in hours immediately following participation in exercise activity therapy. Children did in fact display significantly fewer acting out behaviors following participation in exercise activity therapy as measured by the Devereaux Child Behavior Rating Scale. These findings were interpreted as supporting the hypothesis and ideas for further research using emotionally disturbed children as subjects were discussed.

TABLE of CONTENTS

<u>Section</u>	<u>PAGE</u>
INTRODUCTION.....	1
Depression and Anxiety as a Reaction to Stress.....	3
Childhood Behavior Problems.....	5
Previous Studies: Exercise Therapy and Children.....	7
METHOD.....	9
Subjects.....	9
Assessment.....	9
Procedure.....	10
RESULTS.....	12
DISCUSSION.....	16
REFERENCES.....	19
APPENDIX.....	24

LIST OF TABLES

TABLE

	<u>PAGE</u>
I. Mean Scores for Each Subject in Each Condition.....	14
II. Values and Significance Levels for Paired Group Comparisons.....	15

EXERCISE AND CHILDHOOD ACTING OUT BEHAVIORS

Lucie Thole Hemmen

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Running Head: Acting Out

INTRODUCTION

Interest in the psychological interactions between mind and body are well-documented. For example, Hippocrates developed a doctrine integrating physique and temperament (cited in Tillman, 1965). Much later, the emerging field of psychology paid little attention to how physical and mental health might be related, even though many early psychologists recognized positive association between physical fitness and psychological well-being. Few empirical studies were conducted until relatively recently. Today it appears that a variety of academic fields, from physical education to psychiatry, have addressed this issue with enthusiasm. This thesis will examine the research issues in this growing area of health psychology and the use of exercise as a therapeutic treatment for a population of behaviorally disturbed children.

During the 1950's investigators began to utilize correlational designs to examine the relationship between physical fitness and mental health. These correlational studies indicated that the physically fit might possess more characteristics of physical and mental well-being than the physically unfit. For example, Lobstein, Mosbacher and Ismail (1983) compared inactive and active middle age men and found the active men to be significantly less depressed than their sedentary counterparts. However, it is possible that

individuals with certain psychological characteristics may gravitate toward or show a predilection for physical fitness activities.

In recent years, researchers have tested specific hypotheses concerning the psychological benefits of fitness training. For example, improvements in cardiovascular functioning following exercise have been associated with reports of an increased sense of well-being (Buffone, 1980; Ismail & Trachtman, 1973) and with more effective management of emotional stress (Chapman & Mitchell, 1965). Dishman (1985) concluded that symptom abatement in moderate depression not only can occur with chronic exercise in a manner comparable to psychotherapy, but may even offer a better prognosis in some instances. Morgan (1979) concluded that acute, vigorous physical activity is associated with a decrement in state anxiety, and that this tension reduction persists for approximately 2-4 hours. In addition, Johnsgard (1989) reviewed several studies that indicate anger and hostility are consistently reduced by exercise.

Theories concerning the mental health benefits of fitness can be categorized into: (a) physiological, (b) biochemical, and (c) cognitive. The physiological model is based on evidence that exercise of sufficient duration, frequency, and intensity produces specific physiological changes which then result in a decreased response to emotional and psychological

stress (Ledwidge, 1980). The biochemical model rests on the belief that the positive effects of exercise on mood are the result of biochemical changes in the brain. There is evidence that depressed patients show decreased excretion of amino acid metabolites. Simons, McGowan, Epstein, Kupfer and Robertson (1985), suggest that exercise-produced mood improvement may be due to increased aminergic transmission. One cognitive model is derived from research on the interacting factors between mood and memory. Simons et al. (1985) reviewed several cognitive studies which indicate that mood differentially affects the relative accessibility of negative and positive thoughts. For example, a sedentary depressed person retrieves negative memories and associations more readily than positive ones which serves to perpetuate a cycle in which depression is maintained. A second cognitive model rests on the assumption that regular physical activity results in a sense of mastery, a sense of having control over mood through physical activity (Ismail & Trachtman, 1973; Solomon & Bumpus, 1978). Hollandsworth (1979) believes that aerobic exercise provides training in biofeedback and Morgan (1979) suggests that exercise may simply provide a distraction from anxiety-provoking thoughts.

Depression and Anxiety as a Reaction to Stress

It is a distressing fact that a growing number of North

Americans are becoming increasingly sedentary. Not only do 63% of Americans fail to exercise regularly but a series of 1978 Harris polls (cited by Martin & Dubbert, 1982) indicate that 45% may not exercise at all. As we have become less physically fit, the incidence of illnesses that have important emotional concomitants has increased alarmingly. According to Ledwidge (1980) heart disease is strongly correlated with stress and many personality variables. In addition, approximately 50% of all medical and surgical patients suffer from illnesses that are caused by psychological distress.

Because of the widespread prevalence of stress-related illnesses, researchers have focused on the so-called "stress emotions": depression and anxiety. Research relating fitness training with improvement in mood states is well documented. This result is even more pronounced in those subjects who are more distressed or physically unfit at the outset (e.g., DeVries, 1968; McPherson et al., 1967; Morgan, Roberts, Brand, & Feinerman, 1970).

Selye (1976) demonstrated that stress is associated with a wide variety of physical and psychological disorders. Although the relationship of stress to various psychological outcomes is not clear, stress does affect the etiology and maintenance of emotional disturbance. Klerman (1979) suggested that depressive episodes may be conceptualized as

vain attempts to cope with stress. He contends that clinical depression results from maladaptive response to stress.

Childhood Behavior Problems

Considerable research has been conducted on the prevalence of behavior problems in school-age Children. These studies have resulted in incidence estimates ranging from 1.5% to 30% (Rubin & Balow, 1979). However, the nature of childhood behavior problems has been difficult to study largely because there is no established definition of "behavior disorder." Pine (1980) limits the term "behavior disorder" to describe those children who show a failure to delay between impulse and action. Lieberman (1979) has suggested that aggression is a normal part of children's lives but children ordinarily learn to control their aggressive impulses because of their desire to retain the love of their parents. He believes that a child's acting out behavior may be a symptom or symbolic expression of anxiety, fear, depression, or a feeling of helplessness.

Furthermore, Robins (1974) has suggested that children with "antisocial behavior" disorders constitute the largest proportion of those children who receive psychiatric attention. However, many more antisocial children are dealt with by the police and legal courts than by mental health professionals. Some of these children are classified as

delinquents, behaviorally disordered, underachievers, children with learning disorders, or hyperactive. More boys than girls display acting out behaviors that often continue into adulthood. These disorders also tend to run in families, and conventional psychotherapeutic treatment techniques are often ineffective.

Atkins (1985) suggests that there are five inner dynamics that may be associated with acting out: (a) the child who may often be controlled or inhibited, but episodically acts out as a means of tension discharge, (b) the impulsive child who appears to have no cognitive mediation over his impulse to act, (c) the child who acts out in response to fantasies or to justify a pre-existing sense of guilt, (d) the child who may have a specific ego disturbance which could create a delusion or perceptual distortion in regard to frustration and/or the object of that frustration, and (e) the child whose antisocial behavior may be acceptable within a deviant subculture.

Several theories have attempted to explain why children become behaviorally disordered. Offord, Allen, and Abrams (1978) suggest that stressful factors which can negatively affect parenting are influential in the development of the behaviorally disordered child. Among these factors are single parenting, mental illness in the parent(s) or criminal involvement of the parent(s). Alternative theories have

considered cognitive factors, social learning, biological influences and other salient variables. Etiology aside, a lingering question remains; how are we to intervene effectively with this population of troubled and troublesome children?

Previous Studies: Exercise Therapy and Children

Johnson, Fretz, and Johnson (1968) reported improved self-concept in 74 disturbed children in a 6 week physical development program. More specifically, they described improvements in social adjustment, schoolwork, finger skills, speech and functional intelligence, as well as greater response to psychotherapy.

Solomon and Bumpus (1978) observed hyperactive children with minimal brain dysfunction and found that implementing a physical fitness running program seemed to provide ego enhancement and support. They felt that running reduced the stress level in these children by allowing them to work off excess energy.

In an uncontrolled study on normal children's running, Greist et al. (1978) concluded that children seem to respond to improved neuromuscular control and fitness with generalized improvement in many intellectual and psychological areas. Hilyer, Wilson, Dillon and Caro (1982) found that physical fitness training appeared to elevate self-esteem, reduce anxiety and depression, and promote a

generally healthier psychological state in juvenile delinquents.

Shipman (1984) found that psychotropic medication could be reduced in emotionally disordered children who were placed on a running program. The teachers of these children also reported that the running program resulted in decreased disruptive classroom behavior.

Shennum (1987) explored the effects of an art and dance/movement therapy program on children's behavior in residential treatment and found that greater amounts of expressive activity therapy reduced children's levels of emotional unresponsiveness and acting out behavior.

All these studies demonstrate that exercise programs such as running and dance/movement have been associated with a variety of positive outcomes for emotionally disturbed children.

Rationale

Growing interest and research in the psychological benefits of exercise has not focused extensively on relationships between exercise and acting out behaviors in children. Because factors which are likely to minimize acting out behavior in children include relief from depression, reduced hostility, reduced anxiety and physical tension, and an increased sense of well being, all of which appear to be produced by physical exercise in adults, it was

hypothesized that physical exercise will result in a decrease in acting out behaviors in children.

Hypothesis

Emotionally disturbed children will display a measurable decrease in acting out behaviors following exercise activity therapy compared to non-exercise activity therapy.

Method

Subjects

Subjects were six males between the ages of 10-13 currently in residential treatment for emotionally and behaviorally disturbed children by the State of California. These children had suffered various degrees of physical abuse and/or neglect and had a documented history of acting out behaviors. Many have been diagnosed as oppositional disorders and/or conduct disorders. Each subject was a member of the same "cottage" group and familiar with the experimenter as a staff member. Each child was also in good physical health as attested by a current medical physical examination record on file.

Assessment

Assessment of children's functioning was made with a standard rating scale described below. The daily ratings were conducted by a single staff member who was the most familiar with the children's afternoon and evening routine. The trained rater did not know that an activity therapy was

being studied since the scales were presented as part of a general research project to evaluate residents.

The Devereaux Child Behavior (DCB) Rating Scale (Spivack & Spotts, 1966) was used as the assessment instrument. This instrument was developed specifically for use in assessment of problem behavior in residential treatment programs. For the purpose of the present research, the subscales labeled "social aggression" and "proneness to emotional upset" were the two principal assessment scales. The items which reflect these scales are listed in Appendix A.

Procedure

The experimental scheme was a modified reversal design with the following schedule:

- Week 1: Baseline
- Week 2: Non-Exercise Activity Therapy
- Week 3: Exercise Activity Therapy
- Week 4: Baseline
- Week 5: Exercise Activity Therapy

Each weekly condition consisted of five consecutive days, Monday through Friday. The DCB was completed by the staff rater at the end of his shift in order to document the behavior of each child from 5:00 to bedtime. Bedtime varied from 8:00 p.m. to 9:30 p.m., depending on the child and his earned privileges.

During Week 1 (Baseline), the usual routine between

4:00-5:00 p.m. was in effect. This unstructured routine varied depending on the child and his earned privileges. Most of the children chose to play video games while those who had not yet earned this privilege spent their time reading comic books or sorting baseball cards. Children were routinely encouraged to initiate a physical activity outside the cottage; however, such an activity was rarely more active than a game of tether ball.

During Week 2, the experimenter (cottage staff member) and assistant (also a cottage staff member) spent time with the subjects in non-exercise activity therapy from approximately 4:00-5:00 p.m. The schedule was:

- Day 1: Fishing at nearby park
- Day 2: Group cooking
- Day 3: Trip to the children's library
- Day 4: Watercolor painting
- Day 5: Bracelet weaving

During Week 3, the experimenter and assistant initiated exercise activity therapy. The exercise schedule was:

- Day 1: Vigorous outdoor hike
- Day 2: Physical education par course
- Day 3: Walk/run around campus perimeter
- Day 4: Running games
- Day 5: Indoor low-impact aerobics

During Week 4, the children were on their regular

unspecified routine for the hours 4:00-5:00 p.m. and assessment was completed as in prior conditions.

During Week 5, the experimenter and assistant again followed the exercise activity therapy schedule as outline for Week 3.

Analysis

DCB scores were averaged at the end of each week to give a single score for each subject for that week. Each subject's weekly averaged DCB score was used in a single factor (Group) Analysis of Variance (ANOVA) design with repeated measures (Time). This ANOVA analysis was performed using BMDP-PC program 2V. Post hoc pairwise comparisons were analyzed using the Scheffe' procedure (Winer, 1971, p. 198-199). All statistical tests were made at the $p < .01$ significance level.

RESULTS

Results of each subject's weekly mean score on the DCB are listed in Table I. A dependent t -test was performed between Baseline Week 1 and Baseline Week 2. Since no statistical differences were found in behavioral rating scores ($t(5)=2.4$, $p < .05$) the baseline scores were averaged. A dependent t -test was also performed on Exercise Week 1 and Exercise Week 2 behavioral rating scores. These scores were not significantly different from each other ($t(5)=2.1$, $p < .05$) and Exercise Week 1 and Exercise Week 2 scores were

averaged. The scores in Table I for the Baseline and Exercise columns depict the pooled or averaged scores.

A one-way ANOVA with repeated measures was performed on the combined scores for the three experimental conditions: (a) Baseline (b) Non-Exercise Activity Therapy and (c) Exercise Activity Therapy. Results of this analysis were significant ($F(2,10)=61.15, p < .01$).

Post hoc pairwise contrasts demonstrated that only the Baseline condition vs. Exercise condition and the Non-Exercise condition vs. Exercise condition were significant ($p < .01$ for both tests).

Table I.

Mean DCB Scores

<u>Subject</u>	<u>Non-Exercise</u>		<u>Exercise</u>
	<u>Baseline</u>	<u>Activity Therapy</u>	<u>Activity Therapy</u>
1	24	24	15.8
2	24	24	14.5
3	24.5	22	18
4	25	23	18
5	25.5	25	15
6	27.5	26	15

Note: Scores for exercise activity therapy reflect the averaged scores for both weeks of exercise activity therapy and scores for non-exercise activity therapy reflect the averaged score for both weeks of non-exercise activity therapy.

Table II

Values and Significance Levels for Paired Group Comparisons

	E	p
Baseline vs. Non-Exercise Activity Therapy	2.4	n.s
Non-Exercise Activity Therapy vs. Exercise Activity Therapy	6.9	<.01
Baseline vs. Exercise Activity Therapy	9.6	< .01

Discussion

Research studies have indicated psychological and physical benefits result from regular participation in exercise programs. Since many adult populations have benefited from exercise therapy, it was hypothesized that such an intervention could prove therapeutic in the largely unexplored population of severely emotionally disturbed children. The results obtained support the hypothesis that children will display fewer acting out behaviors on days following participation in physical activity therapy as compared to days following participation in non-exercise activity therapy. The absence of a significant difference between the Baseline and Baseline plus Attention (Non-Exercise Activity Therapy) conditions indicates that the frequency of the children's acting out behaviors was more or less the same whether or not they received scheduled (non-exercise) attention from the experimenters.

Results further show (Table II) that exercise activity therapy is followed by a significant decrease in acting out behaviors as compared to the Baseline condition (children received no intervention) and as compared to the Baseline plus Attention condition (children received Non-Exercise Activity Therapy). This indicates that the decrease in acting out behaviors is related to some dimension or dimensions of the Exercise Activity Therapy and not simply

the results of experimenter attention.

This design focused only on the acute effects following exercise. After the first week of exercise activity therapy, children returned to their unspecified afternoon routine and their measurable frequency in acting out behaviors increased to its previous level. Perhaps if the program encompassed several consecutive weeks, a long term decrease in acting out behaviors might be observed as well. Future studies might address this issue. Additionally, in this study only behavior from 5:00 p.m.- bedtime was observed. Since behavior the following morning was not measured, it is possible that a continued decrease in frequency of acting out behavior may have been observed. Alternatively, it is possible that an increase in frequency (rebound) of acting out behavior may have occurred.

Further research might also consider the magnitude changes in relationship between exercise and acting out behaviors. Currently, we do not know if a greater amount and/or intensity of exercise activity therapy would result in a greater decrease in frequency of acting out behaviors. Future research might also consider using other subscales beyond the two used from the DCB for this experiment. For instance, the DCB also has a Distractibility subscale, an Emotional Detachment subscale, a Poor Coordination and Body Tonus subscale and several others that might be worthy of

examination.

In the future, a program might be designed wherein the children are educated about the positive effects that exercise can play in the reduction of anxiety and the elevation of mood states and encouraged to use exercise as a positive outlet and behavioral management tool. Since emotionally disturbed children often express feelings of powerlessness, a more integrated program encompassing educational aspects of exercise and how it can be used as a tool might well fortify children with a sense of personal power and mastery over previously uncontrolled acting out behaviors.

Because severely emotionally disturbed children are a very specific population, we cannot yet state that exercise therapy might reduce acting out behavior in all children. When considering results, caution must be used in generalizing only to other populations of emotionally disturbed children in residential settings. However, the current research indicates that emotionally disturbed children are indeed viable candidates who may greatly benefit from physical activity intervention.

Acting Out

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APPENDIX A

ITEMS FROM THE DEVEREUX CHILD BEHAVIOR RATING SCALE

Very frequently Often Occasionally Rarely Never
5 4 3 2 1

—

Proneness to Emotional Upset (Sub-scale)

- _____ Express anger in a poorly controlled and tantrumlike fashion?
- _____ Say other children or adults do not like him or are against him?
- _____ React with immediate anger or upset if some other child interferes with his play or takes something that is his?
- _____ Express anger?
- _____ Complain that others are picking on him?
- _____ Get easily upset by peers? (Examples: When teased, pushed, etc.)
- _____ Burst into tears or rage with little provocation?
- _____ Get very upset or overemotional if things don't go his way?

Social Aggression (Sub-scale)

- _____ Hit, bite, scratch, push, or in other ways hurt or attack other children in a free play situation with peers?
- _____ Act bossy or domineering with other children?
- _____ Tease or bully other children?
- _____ Annoy or provoke peers into hitting or in other ways attacking him?