# THE EFFECTS OF A DNA-V PROGRAM ON PSYCHOLOGICAL FLEXIBILITY MODERATED BY GENDER AND RACE

by

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Previous research suggests that adolescents are vulnerable to a wide range of psychological issues and that these issues are often inadequately addressed. When addressed, mental health concerns are commonly handled in schools, who are in a unique position to intervene with social and emotional difficulties. Unfortunately, the implementation of social and emotional curriculum present barriers for implementation and impacting positive change in student functioning. An emerging model of behavior change uses principles of Acceptance and Commitment Therapy, positive psychology, and behaviorism to target behaviors and promise healthy behaviors in youth. Data were collected from four Health/PE classes in a rural high school. The participants received a 6-week universal prevention intervention targeting social and emotional learning skills and psychological inflexibility. Participants who received the intervention curriculum did not exhibit significant changes in psychological inflexibility. Moderation analyses were conducted to determine if the change from pre- to post-intervention was moderated by gender or race. Overall, neither gender nor race moderated the relationship between pre-intervention psychological inflexibility to post-intervention psychological inflexibility.

# THE EFFECT OF A DNA-V PROGRAM ON PSYCHOLOGICAL FLEXIBILITY MODERATED BY GENDER AND RACE

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# CHAPTER 1: Introduction

## Schools as Mental Health Providers

Mental illness is prominent in children and youth, where one in five will experience mental health related issues at least once in their lifetime. Researchers have found that only half of the students who identify as having mental health difficulties will receive the appropriate help. This is even lower in areas where there is limited availability of qualified mental health professionals. Researchers have found that schools are the ideal point to begin early intervention because students spend a large portion of their days in school. Intervening early in schools is vital in order to reduce future mental health related problems for students (Moon, Williford, & Mendenhall, 2017). Schools provide approximately 40% of student's mental health treatment putting them in the best position to intervene and get help (Meyers, Tobin, Huber, Conway, & Shelvin, 2015). Schools also serve as a good location to offer mental health related services because, at the school, providers can reach the students who would not be able to seek help if they had to do so on their own.

School mental health professionals believe that school based mental health should be addressed at three levels of need. Tier 1 reaches every student at the school, the secondary level serves students who are at risk and schools begin more individualized intervention, and the tertiary level provides more intensive intervention to the students who have been identified as having significant mental health needs. At tier 1, supports have been used to assist with student's overall mental health and well-being (Sugai et al., 2000).

## Social Emotional Learning and Mental Health in Adolescents

Students who are experiencing mental health difficulties may lack skills in social emotional learning (SEL) and benefit from intervention. SEL refers to programs that are

designed to assist students in gaining skills in areas of self-regulation and creating/maintaining interpersonal relationships (Meyers et al., 2015). Durlak and colleagues (2011) found that SEL programs could be successful at all education levels and across geographical regions. SEL programs are generally seen as Tier 1, or universal prevention services, as they can be delivered to all students in a general education setting. However, students can be provided more intensive supports (Tier 2 or Tier 3) if they are seen as having more severe deficits in self-regulation and interpersonal relationships (Meyers et al., 2015).

Recent research has looked at the connection between SEL and school-related outcomes in students. In a meta-analysis completed by Durlak and colleagues (2011), it was found that SEL programs assisted in improving students' connection to school, classroom behavior, and academic achievement. The meta-analysis looked at 213 school-based programs that administered different universal prevention interventions that specifically focus on SEL. It was found that SEL curriculums were associated with significant changes in overall emotional functioning in youth. The results indicated that there were significant reductions in internalizing and conduct related problems. The researchers concluded that although follow-ups were rarely done, there were significant changes in participants up to six months after the intervention had ended. They also found that school professionals are more effective at improving social and emotional outcomes in students than non-school professionals (Durlak et al., 2011)

**Psychological Flexibility**

Psychological flexibility and SEL are both theoretical concepts that are associated with increasing positive outcomes in the mental health of youth and improving overall functioning. Interventions based on these two concepts have the similar goal of helping students to effectively handle the changes that they may face throughout their lives (Bond, Hayes, & Barnes-Holmes,

2006). Psychological flexibility is an important factor in psychological and behavioral health and effectiveness. Researchers often use terms such as self-control, emotion regulation, self-regulation, and psychological flexibility interchangeably. Psychological flexibility is a process that describes a pattern of working with the environment (Williams, Ciarrochi & Heaven, 2012).

Psychological flexibility is composed of six interrelated constructs: present moment awareness, acceptance, defusion, self as context, values, and committed action (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Present moment awareness consists of being aware of what is happening in the environment and the emotions that are felt in that moment. Acceptance involves understanding the reasons for events or thoughts and not trying to alter the reasons. Defusion is noticing one's thoughts and feelings and being able to recognize when they are negative but not allowing those negative thoughts and feelings to cause individuals to avoid certain situations or circumstances. Defusion is commonly called mindfulness, which is bringing one's attention to the present moment and being aware of what experiences a person is having. Self as context involves being aware of the thoughts and emotions one is feeling, while also being able to respond appropriately to those thoughts and emotions. Values consist of chosen qualities of behaviors that people work toward but commonly do not occur all at once. Therefore, people have to constantly work in order to reach these qualities. Lastly, committed action is when people begin to make goals and changes and put these goals into action, such as recognizing the behavioral changes that one needs to begin making in order to reach set goals (Bond, Hayes, & Barnes-Holmes, 2006).

Persons who are psychologically flexible are in touch with their present thoughts and feelings related to their past experiences, and this helps them to prepare for future events and make valued choices and decisions (Ruiz & Perete, 2015). There is little research on how

psychological flexibility impacts academic functioning directly. However, it is well-established that changes in a student's psychological functioning across a variety of other mental health related issues, such as depression and anxiety, have a significant impact on school performance (Forman, Herbert, Moitra, Yeomans, & Geller, 2007).

**Acceptance and Commitment Therapy**

Acceptance and commitment therapy (ACT) is the most common therapeutic approach focused on changes in psychological flexibility. ACT applies mindfulness, which involves putting attention on the present moment with open-mindedness to one's own thoughts, feelings, and memories. The purpose of ACT is to teach individuals to notice when they are engaging in avoidance techniques and assist them with engaging in behaviors that are consistent with their personal values in order to regulate emotions. Research regarding ACT used with adolescents is limited, so there is little evidence for the effectiveness of using ACT with adolescents. However, there have been a few randomized studies conducted that suggest ACT reduces depressive symptoms, unsafe sexual behaviors, chronic pain, anxiety symptoms, and stress in adolescents (Burckhardt et al., 2016).

Although there is little evidence to show the effectiveness of using ACT with adolescents, ACT has been proven as beneficial to a number of different demographic groups. A study completed on thirty-four graduate students found that a six-week intervention of values clarification and committed action training increased academic performance and psychological flexibility. Results showed a statistically significant increase in improvement of students' academic achievement measured by test scores and psychological flexibility as measured by the AAQ-II. Research has shown that there are multiple ways to deliver ACT therapy to individuals. In this study, the researchers didn't modify any of the ACT materials and they delivered the

intervention outside of class and away from all course materials. The researchers found that targeting values and goal setting increased student performance in the ACT group better than those who received study tips in the active treatment control group (Paliliunas, Belisle, & Dixon, 2018).

There have been a number of reviews of the literature on ACT used with children. However, these reviews had a number of limitations, such as using articles that were solely theoretical and were not subjected to peer review. Therefore, Swain and colleagues (2015) conducted a literature review of published and unpublished literature for ACT in the treatment of children. The researchers decided to conduct an exploration of findings and an evaluation of the methodology of the studies they included. There were twenty-one eligible studies used to complete the review. Researchers found that although ACT research is still in its early stages, ACT has been found to produces significant improvements in self and reported clinical outcomes across a wide range of presenting problems. As for the methodology of the studies included, researchers found that there were sufficient details provided to allow for replication, the outcomes of all assessments were followed up on, and the outcome measures were valid and reliable (Swain, Hancock, Dixon, & Bowman, 2015).

**The DNA-V Model**

The DNA-V model uses components of the ACT intervention and positive psychology to work with adolescents. The DNA-V model is used as a flexible approach for group level programming, which gives it the potential to work in a classroom or large group setting. The DNA-V model is used to target psychological flexibility similarly to the overall process of ACT. The DNA-V model is composed of three classes of behavior: Discoverer, Noticer, and Advisor (DNA). These names refer to the core processes that are needed to enable adolescents to respond

to their environment in an appropriate manner. The idea is that building these DNA skills will help youth to select behaviors that align with their chosen values (V). The DNA skills and valued action skills are thought to occur within individuals and their environment. The idea of these skills occurring within the individual is known as self-view. Self-view is an individual's ability to recognize oneself as a constant individual and being in an ongoing developmental process. The skills occurring within an individual's environment are known as social view. Social view is understanding perspectives beyond one's own, for example using personal knowledge to form and maintain relationships (Hayes & Ciarrochi, 2015). This model has been used to develop an intervention in other forms of therapy but has not been explicitly tested with adolescents, nor has it been used in a school setting or as a universal prevention model. However, the model has shown that it has a flexible approach for developing a group level program that could be effective in a classroom setting.

**Demographic Variables Being Considered**

Research investigating moderators in prevention science among elementary students has focused primarily on gender differences (Bierman, 2002; Bierman et al., 2010). A review conducted by Farrell and colleagues (2013) of universal school-based violence prevention programs indicated that gender differences and other demographic characteristics produced mixed results. Specifically, no consistent pattern of moderation existed across gender or race/ethnicity differences (Farrell et al., 2013). Farrell and colleagues' comment on the significant methodological limitations in examining moderators in school-based prevention research. Issues include lack of theoretical basis for treatment components and measurement, incompatible research designs and insufficient statistical analyses. These are important issues to address because without a clear understanding of what components of treatment are responsible

for changes during intervention, it is difficult to fully assess the participant characteristics associated with maximum treatment benefit.

### *Gender Differences*

Girls suffer more from internalizing disorders compared to boys, who suffer more from externalizing disorders. Girls tend to have greater difficulties than boys with depression and anxiety, which can lead to feelings of hopelessness and helplessness. Mental health issues in boys tend to manifest themselves in antisocial personality and substance abuse disorders. Boys tend to have greater issues than girls with aggressive and antisocial characteristics and have difficulties forming close, reliable relationships (Cuffe, Waller, Cuccaro, Pumeriega, & Garrison, 1995).

Overall, since girls are more willing to seek services and are more flexible in treatment approaches, there is an idea that they will respond more than boys to a universal prevention program. Girls tend to have more depression and anxiety than boys, therefore interventions such as DNA-V and ACT may be differentially effective based on gender.

### *Racial Differences*

In Black students, there is less of a gap than in White students between girls and boys who demonstrate differences in externalizing verses internalizing difficulties (Rosenfield & Mouzon, 2013). There are differences in the rate and type of diagnoses, externalizing verses internalizing, in Black boys and girls, but there is currently no clear reasoning for why these differences occur (Hankin, 2009).

Differences have been found between the rate of Black students who have mental health disorders and that of same aged White peers. Black students reported higher depressive symptoms, which is consistent with previous research that found that Black students respond

more negatively to mental distress than their White peers (Cuffe, Waller, Cuccaro, Pumariega, & Garrison, 1995). Black students are reported to have higher levels of flexibility when it comes to treatment and treatment approaches, which is why it is thought that students who are Black will respond better than White students to a universal prevention program (Weaver, Himle, Taylor, Matusko, & Abelson, 2015). Also, it is thought that since Black students have higher rates of depression than their White peers, they will have greater benefits from this type of intervention.

**Current Study Hypotheses**

This current study investigated the relationship between the increases in psychological flexibility following the DNA-V-PE intervention across different races and genders.

*Hypothesis 1*: Psychological flexibility in a group of high school students in eastern North Carolina will increase significantly following participation in a program based on the DNA-V model.

*Hypothesis 2*: This increase will be moderated by gender with girls showing significantly greater increases in psychological flexibility than boys.

*Hypothesis 3*: This increase will be moderated by race with Black students showing significantly greater increases in psychological flexibility than White students.

# CHAPTER 2: Methods

## Participants

The current study is a subset of a more comprehensive study that investigated how targeting psychological flexibility in youth might enhance health-related behaviors. The Institutional Review Board (IRB) granted permission for this research study (See Appendix A). Both the IRB and the County Superintendent gave permission for passive consent to be sufficient for students to participate in the study. The study sample included students in grades 9 through 12 at a public high school in eastern North Carolina. Based on their enrollment in the Health/Physical Education (PE) classes at the high school, approximately 155 students were asked to participate in the more comprehensive study. After requesting assent, there were 83 total students participating in the intervention group of study.

The intervention was incorporated as part of a mandatory Health/PE curriculum; therefore, all students were included in the intervention and program evaluation. Assent was obtained from all participants in order for their data to be included in the subsequent analysis. Although the families were able to opt out of including the child's data in the study, no families chose to have their child's data excluded from the research analyses.

## Measures

### *Demographics Questionnaires*

A demographics questionnaire (see Appendix B) was created to gain information about the current population participating in the primary study. The participants completed a demographics questionnaire with questions about their gender, age, race/ethnicity, physical

disabilities, and parent's education levels. The students were also asked about any other psychological interventions they had previously completed.

***Avoidance and Fusion Questionnaire for Youth (AFQ-Y8)***

The AFQ-Y8 (see appendix C) is used to measure experiential avoidance and cognitive fusion. Experiential avoidance is an individual's attempt to avoid feelings, thoughts, memories, or experiences that are upsetting or difficult to face. Cognitive fusion refers to individuals interpreting thoughts that they have had about experiences and viewing them as true, instead of viewing them in the context of their own personal experiences. Items are based on an ACT model and questions are designed to represent psychological inflexibility that was fostered by cognitive fusion and experiential avoidance. For example, the AFQ-Y8 asks questions like, "My thoughts and feelings mess up my life" and "I push away thoughts and feelings that I don't like."

To further the development of the AFQ-Y8, Greco, Lambert, and Baer (2008) completed five separate research experiments to gain feedback from experts, to reduce the initial number of items on the AFQ-Y8, to develop a short form for the measure, to evaluate the final two measures, and to present validity coefficients for both versions of the AFQ-Y8. The items on the AFQ-Y8 have adequate internal consistency reliability ($\alpha$ = .90) and medium to large effect sizes in construct validity (Greco, Lambert, & Baer, 2008). The AFQ-Y8 is an 8-item self-report measure that is used to ask participants to rate how true an item is on a 5-point Likert Scale (0 = not true at all; 4 = very true). Students completed the AFQ-Y8 at baseline, weekly, post-intervention, and at one year follow up. For this study, the baseline and post-intervention AFQ-Y8 completed by participants were used to look at psychological flexibility pre and post intervention.

## Procedures

Permission to conduct this research was granted by the Institutional Review Board (IRB) at East Carolina University. The more comprehensive study took place over an eight-week span. The first week of the study involved collecting pre-intervention assessment data, and the eighth week of the study involved collecting post-intervention assessment data. The DNA-V intervention was implemented for six weeks. Throughout the first week of intervention, students were given an overview of the objectives of the program and were allowed to ask any questions. Classes were divided into two groups, the enhanced DNA-V Health/PE (DNA-V-PE) condition or the control condition. The content of the intervention covered broad topics, such as sleep and physical activity. The overarching goals and objectives for each session of the DNA-V-PE condition are outlined in Table 1. Each class received their program twice a week for a six-week period.

Throughout the six-week intervention period, students completed measures to track their progress in the intervention and control group. The measure used throughout the larger study was the psychological flexibility questionnaire, the AFQ-Y. The measure was used prior to the intervention beginning, throughout the intervention, and at the end of the intervention for an eight-week follow up assessment. In total, there were six classes participating in the larger study. Four classes received the DNA-V-PE intervention. The four intervention classes consisted of one freshman level PE course and three advanced level PE classes. Intervention sessions were implemented twice a week for six weeks. The participants in the DNA-V-PE condition received a total of twelve intervention sessions. During each of these twelve sessions, students engaged in around 55 minutes of intervention throughout their PE class.

Study personnel were at the school for the two intervention days per week and focused on implementing the treatment and collecting data. The study personnel were Pediatric School Psychology doctoral students. Doctoral students assigned random alphanumeric codes in order to deidentify the participants' information. Demographic information and survey data were collected with the students' identifying information and stored at the school in a locked filing cabinet. The deidentified demographic and survey data were later placed into locked filing cabinets at East Carolina University and then entered into the REDCap data base in order to run both studies' analyses.

Table 1

*Description of Each Session for DNA-v-PE Program*

| Session title | Session Content |
|---|---|
| Session 1: Introduction to DNA-v-PE | Informed Consent/Assent<br>DNA-v-PE Overview<br>Creating a strong group |
| Session 2: Introduction to DNA-v-PE | Group goal-setting<br>Introduction to DNA-v model<br>Orientation to DNA-v model.<br>Introduce values |
| Session 3: Introduction to Sleep | Basic sleep information<br>Sleep values exercises<br>Introduce SMART goal-setting. |
| Session 4: Sleep Hygiene | Review previous content<br>Sleep hygiene content<br>Sleep Advisor exercises<br>Set SMART goals. |
| Session 5: Sleep and Mental Health | Review SMART goals and previous content<br>Sleep and mental health content<br>Sleep Noticer exercises. |

| Session title | Session Content |
|---|---|
| Session 6: Sleep Solutions | Review previous content<br>Sleep solutions content<br>Sleep Discoverer exercises<br>Set short- and long-term sleep SMART goals. |
| Session 7: Introduction to PA | Review previous content<br>Review of Values<br>PA Values exercises<br>Review SMART goal-setting. |
| Session 8: Benefits of PA | Review previous content<br>Review Advisor<br>Benefits of PA content<br>PA Advisor exercises<br>PA SMART goal setting. |
| Session 9: Physical Inactivity | Review previous content<br>Physical inactivity content<br>Review Noticer<br>PA Noticer exercises |
| Session 10: PA and Stress | Review previous content<br>PA and stress content<br>PA Noticer exercises<br>Review Discoverer<br>PA SMART goal-setting. |
| Session 11: PA and Mental Health | Review previous content<br>PA and mental health content<br>PA Discoverer exercises<br>Return to PA values. |
| Session 12: SMART goals and Termination | Review previous content<br>Return to sleep and PA values<br>Set short- and long-term PA and sleep goals<br>Program conclusion. |

*Note*. DNA-v-PE = Discoverer, Noticer, Advisor, Values, Physical Education; DNA-v = Discoverer, Noticer, Advisor, Values; SMART = Specific, Meaningful, Adaptive, Realistic, Time-Framed; PA = Physical Activity.

**Data Analysis**

Data were analyzed using a simple moderation model. The model tests the hypothesis that a student's race and gender serve as an interaction effect for the relationship between the DNA-V-PE intervention and psychological flexibility. In other words, the hypothesis tested is the degree to which the relationship between the DNA-V-PE intervention and an increase in psychological flexibility depends on the students' race and/or gender. The analysis was conducted using the PROCESS file for SPSS (Hayes, 2017), which provides a statistical moderation analysis. The interactions and main effects of each of the potential moderating variables were analyzed, to see if there was significant effect between success in the intervention and participants' race or gender.

## CHAPTER 3: Results

The final intervention sample ($n$ = 88) was predominantly boys (61.3%) from a range of ethnic backgrounds including African American/Black (51.3%), Hispanic/Latinex (26.3%), and White (22.5%). Most participants reported the highest education level attained by either of their parents as a high school graduate or equivalent (GED) (35.1%), with 31.2% reporting neither parent completed high school. Of participants in the intervention group 92% reported that they receive free or reduced lunch.

Table 2
*Demographics*

| Demographic characteristic | DNA-v-PE ($n$ = 83) |
|---|---|
| Age, *M* | 15.8 |
| Gender, *%* boys | 61.3 |
| Race/Ethnicity, *%* | |
| African-American | 51.3 |
| Hispanic/Latino | 26.3 |
| White | 22.5 |
| Parental Education, *%* | |
| Did not complete high school | 31.2 |
| High school or GED | 35.1 |
| Some college | 7.8 |
| Certificate, technical or vocational | 1.3 |
| Associate's degree | 1.3 |
| Bachelor's degree | 7.8 |
| Master's degree | 11.7 |
| Other | 3.9 |
| Free or Reduced Lunch, *%* | 92 |

*Note*. GED = General Education Development, IEP = Individualized Education Program

For Hypothesis 1, a paired samples t-test was conducted to compare pre-intervention psychological inflexibility and post-intervention psychological inflexibility. There was not a significant difference in the scores for pre-psychological inflexibility ($M$= 7.08, $SD$ = 5.91) and post-psychological inflexibility ($M$= 7.51, $SD$= 7.76), $t(60)$ = -0.55, 95% CI [-1.96, 1.12], $p$ = 0.58, $d$ = 0.06.

To address hypotheses 2, a moderation analysis was conducted to identify if gender significantly interacted with pre-intervention psychological inflexibility to predict post-intervention psychological inflexibility. Results are reported in Table 3. Results indicated that when moderating for gender there is a non-significant relationship between pre psychological inflexibility and post psychological inflexibility. In sum, gender did not significantly impact change from pre to post scores of psychological inflexibility.

Table 3
*Interaction between pre-psychological inflexibility and gender.*

| | *b* | *SE* | *t* | CI | *p* |
|---|---|---|---|---|---|
| $R^2$ = 0.72, $MSE$ = 31.39 | | | | | |
| Intercept = .70 | | | | | |
| Pre-Intervention | -.22 | .39 | -.57 | -1.01, .55 | 0.57 |
| Interaction | .70 | .25 | 2.82 | 0.20, 1.20 | 0.06 |
| Gender | -2.37 | 2.38 | -.99 | -0.09, 6.78 | 0.32 |
| Race | -.18 | .65 | -.28 | -1.48, 1.12 | 0.78 |

To address hypotheses 3, a moderation analysis was conducted to identify if race significantly interacted with pre-intervention psychological inflexibility to predict post-intervention psychological inflexibility. Results are reported in Table 4. Results indicated that when moderating for race there is a non-significant relationship between pre psychological

inflexibility and post psychological inflexibility. In sum, race did not significantly impact change from pre to post scores of psychological inflexibility.

Table 4
*Interaction between pre-psychological inflexibility and race.*

| | *b* | *SE* | *t* | CI | *p* |
|---|---|---|---|---|---|
| $R^2$ = .47, *MSE* = 37.15 | | | | | |
| Intercept = .32 | | | | | |
| Pre Intervention | .96 | .28 | 5.20 | 0.59, 1.32 | <.001 |
| Interaction | .22 | .42 | 1.04 | -0.63, 1.06 | 0.61 |
| Race | -4.25 | 5.04 | -.84 | -14.37, 5.87 | 0.40 |
| Gender | 3.35 | 1.71 | 1.96 | -0.09, 6.78 | 0.06 |

## CHAPTER 4: Discussion

The current research study attempted to investigate the overall effect and moderating effects that gender and race had on increasing psychological flexibility after engaging in an 8-week intervention. Participants in this study were placed into the study based on their enrollment in a Health/Physical Education (PE) course at a local high school. Specifically, the present study investigated (1) if there was change in psychological inflexibility from pre- to post-intervention; and (2) if any changes in psychological inflexibility from pre- to post-intervention were moderated by gender or race.

Results from the present study indicate that there was no significant change from pre-intervention to post-intervention psychological inflexibility. The study used a measure looking at self-reported levels of psychological inflexibility in students. The DNA-V-PE model was adapted from the DNA-V model to aid in implementation in a Health/PE setting. Adding in sleep hygiene and physical activity into the DNA-V model may have prevented the amount of DNA-V content provided to students. Therefore, it is possible that the students did not receive sufficient dosage and an adequate number of components to target psychological inflexibility. Historically, research has also shown that using preventative interventions for internalizing disorders such as anxiety and depression have difficult demonstrating efficacy in results (Ahlen, Lenhard, & Ghaderi, 2015; Brunwasser & Garber, 2016). The insignificant change from pre- to post-intervention may result from the difficulties implementing effective preventative interventions to target these areas.

Gender and race were examined as potential moderators of pre-post changes in psychological inflexibility. Neither gender nor race moderated the relationship changes from pre-intervention psychological inflexibility to post-intervention psychological inflexibility. Due to

unequal distributions across race, it is possible that the change from pre-intervention to post-intervention psychological inflexibility was not identifiable due to the differences in group sizes. With regard to gender, it is likely that there were issues in reporting on a self-report measure for students. Research has shown that in Tier 1 preventative settings, there is a decreased likelihood that students with internalizing and higher levels of social concerns will benefit than peers with externalizing concerns (Split, Koot, & van Lier, 2013).

**Limitations**

There are several limitations to the current research study. The DNA-V-PE program was designed to be implemented to all students in health/PE courses. Therefore, limited inclusion/exclusion criteria were used to determine participation in the study. Also, it was reported by school personnel that the advanced level courses had higher rates of behavior concerns, lack of attention, and noncompliance. More stringent inclusion/exclusion criteria could have increased the effectiveness of the intervention.

The more comprehensive study consisted of participants completing three large rating scales to measure sleep, psychological flexibility, and physical activity. Participants were required to complete rating scales with multiple components eight times throughout the duration of the intervention. The ratings scales were self-report which may have proven to be a limitation due to the risk of participants experiencing fatigue in responding and engaging in socially desirable reporting of their current symptoms and progress. The measure of this study, the AFQ-Y8, was used as a pre-post measure. The measure has not been used previously to detect small changes in an 8-week time period.

Teacher buy-in and maintenance were also possible limitations for the current study. The intervention was completed in two different Health/PE courses, where one of the teachers left in

the first part of the semester and the remainder of the intervention was completed with a substitute. The teacher leaving in the beginning the semester required the substitute to maintain and keep track of the incoming data from the students. Fidelity checklists indicated that the facilitator delivered 98% of the total, predefined session-by session agenda. However, throughout the intervention sessions, teachers often left the behavior management up to the interventionist and behaviors were sometimes unmanageable.

The DNA-V-PE program required participants to openly discuss and talk about their own internalizing concerns in front of peers. Due to the stigma surrounding mental health issues, there was likely a decrease in student involvement and willingness to participate in the intervention. Participants noted that they did not like having to open up and discuss their personal issues in front of so many peers and classmates, especially things as personal as internalizing concerns.

The demographic make-up of the study sample is not fully representative of the population. The participants in the present sample only represent a small section of the population of adolescents in a high school setting. This study looked at gender and race as moderating variables. The number of girls and boys in the sample studied were relatively equal. However, the sample varied widely in regard to the age and race. There were substantial differences between the number of White verses Non-White students. The differences in these groups could be associated with the lack of impact noted in the current study. Another limitation that could have led to a lack of change may be the high levels of psychological flexibility that participants reported prior to participation in the intervention.

**Future Directions and Clinical Implications**

Future researchers should aim to have a larger sample size with more equal groups regarding gender, race, and age. There should be more stringent inclusion/exclusion criteria to

strengthen the internal and external validity of the study and to provide clearer justifications for continued research. Future researchers should also consider implementing the DNA-V intervention with other populations, instead of just implementing the intervention in Health/PE courses.

Due to the large amount of rating scales that participants were expected to complete, burnout likely contributed to poorly completed scales. Future researchers should likely look at one component (psychological flexibility, sleep, and physical activity) at a time in order to decrease the amount of rating scales needed to be completed weekly. Completing separate studies to research each of these components would be beneficial and likely result in greater feasibility and reliability of the study given the self-report nature of the measures.

The participants in the study were noted to exhibit behavior problems throughout the intervention implementation. Therefore, future researchers should incorporate a behavior management focus that is geared to increased attentiveness and engagement of participants. It is likely that this will aid in decreasing the amount of problem behaviors that occurred throughout intervention implementation.

Lastly, due to the increased concerns regarding participants having to share their internalizing concerns, this intervention would likely be more appropriate as a Tier 2 or Tier 3 more intensive intervention. This would likely be more appropriate due to the nature of the presenting concerns and the likelihood for individuals to open up and talk about personal experiences in smaller group settings. Researchers should consider this for future study procedures.

## Conclusions

The current study looked at the effects of the DNA-V model on psychological inflexibility in youth in a high school Health/PE course. The study did not yield significant results in showing change from pre-intervention to post-intervention in regard to the student's psychological inflexibility. Gender and race were not significant moderating variables for change from pre- to post-intervention. Implementation of this intervention in smaller doses and with more targeted groups represents an area of opportunity for future research.

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APPENDIX A: IRB Approval Form

**EAST CAROLINA UNIVERSITY**
**University & Medical Center Institutional Review Board Office**
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

# Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: Samuel Faulkner
CC: Jeannie Golden
Date: 3/22/2017
Re: UMCIRB 17-000279
Enhancing Psychological Flexibility in Youth in the Context of a High School Physical Education/Health Class

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 3/22/2017 to 3/21/2018. The research study is eligible for review under expedited category #7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

| Name | Description |
|---|---|
| Adolescent Sleep Hygiene Scale | Surveys and Questionnaires |
| Avoidance and Fusion Questionnaire for Youth | Surveys and Questionnaires |
| Child and Adolescent Mindfulness Measure | Surveys and Questionnaires |
| Demographics Form - Student | Data Collection Sheet |
| Parent Permission Form | Consent Forms |
| Student Assent Form | Consent Forms |
| Targeting Psychological Flexibility in Youth to Enhance Health-Related | Study Protocol or Grant |

| Behaviors | Application |
| --- | --- |
| The Chairperson (or designee) does not have a potential for conflict of interest on this study. | |

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

APPENDIX B: Demographics Form

*Confidential*



# Demographics

Please complete the survey below.

Thank you!

1) How old are you?

_____

2) What gender do you identify with?

- ◯ Male
- ◯ Female
- ◯ Transgendered Male
- ◯ Transgendered Female
- ◯ N/A, did not answer

3) What do you consider your predominant race/ethnicity to be (the one you identify with the most)?

- ◯ African American/Black
- ◯ Hispanic/Latino
- ◯ American Indian/Native American
- ◯ Caucasian/White
- ◯ Asian
- ◯ Native Hawaiian/Pacific Islander
- ◯ Other
- ◯ N/A, did not answer

4) What is the highest education level of either of your parents or legal guardians? (choose one)

- ◯ Did not complete high school
- ◯ High school graduate or equivalent (GED)
- ◯ Some college, but no degree
- ◯ Certificate, technical or vocational training
- ◯ Associate's degree
- ◯ Bachelor's degree
- ◯ Master's degree
- ◯ Doctoral degree
- ◯ Other
- ◯ N/A, did not answer

5) What is your living arrangement?

- ◯ Live with mother and father
- ◯ Live part time with mother, part time with father
- ◯ Primary residence is with mother
- ◯ Primary residence is with father
- ◯ Other
- ◯ N/A, did not answer

| | | Yes | No | N/A, did not answer |
|---|---|---|---|---|
| 6) | Is English your first language? | ◯ | ◯ | ◯ |
| 7) | Are you eligible for or do you receive free or reduced lunch? | ◯ | ◯ | ◯ |
| 8) | Do you have an individualized education program (IEP)? | ◯ | ◯ | ◯ |
| 9) | Are you in any special programs (reading, math, speech, etc.)? | ◯ | ◯ | ◯ |

10) If yes, please desribe:

_____

11) Have you ever repeated a grade?
- ◯ Yes
- ◯ No
- ◯ N/A, did not answer

12) If yes, what grade(s)?

_____

13) Have you been suspended from school?
- ◯ Yes
- ◯ No
- ◯ N/A, did not answer

14) If yes, how many times?

_____

15) What was your grade point average (GPA) at the end of the last school year? 0-4

_____

APPENDIX C: Avoidance and Fusion Questionnaire for Youth 8 (AFQ-Y8)

*Confidential*



# AFQY8

Please complete the survey below as honestly as possible.

Thank you!

## AFQ-Y8 Pre-test

| | | Not at all true | A little true | Pretty true | True | Very true | N/A, Did not answer |
|---|---|---|---|---|---|---|---|
| 1) | My life won't be good until I feel happy. | ○ | ○ | ○ | ○ | ○ | ○ |
| 2) | My thoughts and feelings mess up my life. | ○ | ○ | ○ | ○ | ○ | ○ |
| 3) | The bad things I think about myself must be true. | ○ | ○ | ○ | ○ | ○ | ○ |
| 4) | If my heart beats fast, there must be something wrong with me. | ○ | ○ | ○ | ○ | ○ | ○ |
| 5) | I stop doing things that are important to me whenever I feel bad. | ○ | ○ | ○ | ○ | ○ | ○ |
| 6) | I do worse in school when I have thoughts that make me feel sad. | ○ | ○ | ○ | ○ | ○ | ○ |
| 7) | I am afraid of my feelings. | ○ | ○ | ○ | ○ | ○ | ○ |
| 8) | I can't be a good friend when I feel upset. | ○ | ○ | ○ | ○ | ○ | ○ |

Score and Interpretation Guide
1. Create the Psychological Inflexibility Scale score by summing all 8 items.
2. No reverse-scoring necessary.
3. Higher scale scores represent greater levels of psychological inflexibility.
4. A cutoff score of 15 identifies youth at-risk for clinical levels of internalizing problems
5. No large-scale normative data available.
6. The AFQ-Y8 was originally developed by Greco, Lambert, & Baer (2008)
7. For more information visit: www.tylerrenshaw.com/afq-y8

9) AFQY8 TOTAL SCORE _____

10) At-Risk for Clinical Levels of Internalizing Symptoms (Total Score of at least 15)
○ Yes
○ No