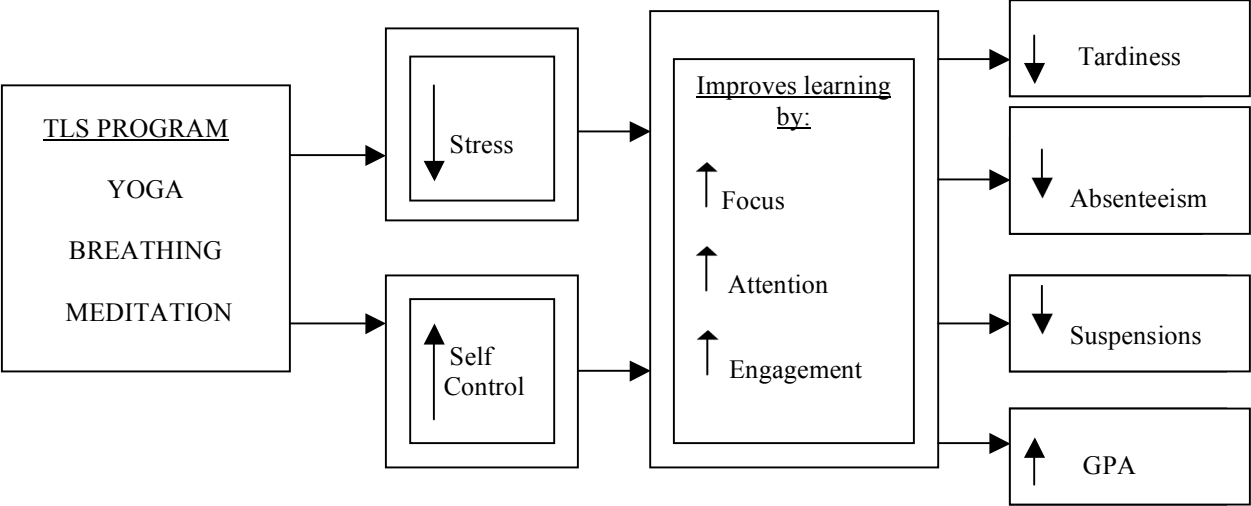


Executive Summary
El Cerrito High School Transformative Life Skills Program; Fall Semester 2008
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Program Hypothesis

The Niroga Transformative Life Skills (TLS) program—a 15-minute protocol including yoga, breathing techniques and meditation, administered regularly in classrooms—will help students to: 1) reduce stress; 2) increase self-control, prepare them to learn with focus, attention and engagement; and, 3) positively impact tardiness, absenteeism, suspensions, and GPA.



Methods

The 15-minute Transformative Life Skills (TLS) protocol—a multi-modality intervention including yoga, breathing techniques and meditation—was delivered in 15 classrooms at El Cerrito High School during the Fall 2008 semester for a total of 18 weeks, with the frequency varying from one to five times/week. In addition, three (3) classrooms were selected to serve as a control/comparison group—all of whom did *not* receive the TLS protocol.

Two instruments were selected to assess perceived stress and self-control: the 10-item Perceived Stress Scale--PSS10 (Cohen, Kamarck, Mermelstein, 1983¹; Cohen & Williamson, 1988²), and the 13-item Tagney Self Control Scale TSCS-13 respectively (Tagney, Baumesiter, & Boone, 2004³). They were administered at the beginning and end of the semester in all classrooms, in addition to a mid-semester snapshot consisting of the PSS10 and a qualitative survey for intervention students *and* teachers. T-Tests and ANOVA will be used to explore differences between and within intervention and control students’ self-control and perceived stress

¹ Cohen, S., Kamarck, T., Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
² Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health: Claremont Symposium on applied social psychology*. Newbury Park, CA: Sage
³ Tagney, J.P., Baumesiter, R.F., & Boone, A.L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, 72(2), 271-324.

throughout the course of the program. In addition, we will also explore the impact of gender and dose (# of classes/week) on self-reported self-control and perceived stress.

Furthermore, to explore the impact of the TLS program on student tardiness, absenteeism, suspensions, and GPA these data will be collected prior to TLS implementation (i.e., previous academic semester) and at the conclusion of the program (i.e., Dec 08/Jan 09). T-tests will be used to explore any significant differences between intervention and control groups within these domains.

Results

A total of 15 classrooms (totaling 472 students) were chosen for the intervention, while 3 classrooms (totaling 85 students) served as the control group. The intervention group was comprised on 48.8% males and 51.2% females, while the control group was comprised of 61.2% male and 38.8% female (please see Table 1). Overall, 15.7% of the total sample served as the control group, while 12.5% received 1 class/week, 24.1% received 2 classes/week, 35.2% received 3 classes/week, and 12.5% received 5 classes/week (please see Table 2).

Table 1: Gender by Control v. Intervention

	% Male	% Female
Control	61.2	38.8
Intervention	48.8	51.2

Table 2: Frequency of classes/week

Classes/Week	Frequency	Percent
0 (Student in Control Group)	85	15.7
1	68	12.5
2	131	24.1
3	191	35.2
5	68	12.5
Total	543	100

The current sampling design (pre, mid, and post-test) yielded moderate-to-high overall survey response, with an average of 67.9% with the control classrooms and 71.8% in the intervention classrooms. Also, similar to previous studies (Cohen, Kamarch, Mermelstein, 1983; Cohen & Williamson, 1988; Tagney, Baumesiter, & Boone, 2004), the instruments demonstrated acceptable reliability: Cronbach's Alpha ranged from .78 - .87 on the PSS10 and .82-.83 on the TSCS. The data were first entered into an excel database and later transferred to SPSS Version 16 for further analysis.

	PRE		MID		POST	
	# of valid cases	Alpha	# of valid cases	Alpha	# of valid cases	Alpha
PSS10 (10 items)	413	.78	337	.84	387	.87
TSCS13 (13 items)	410	.82	***	***	377	.83

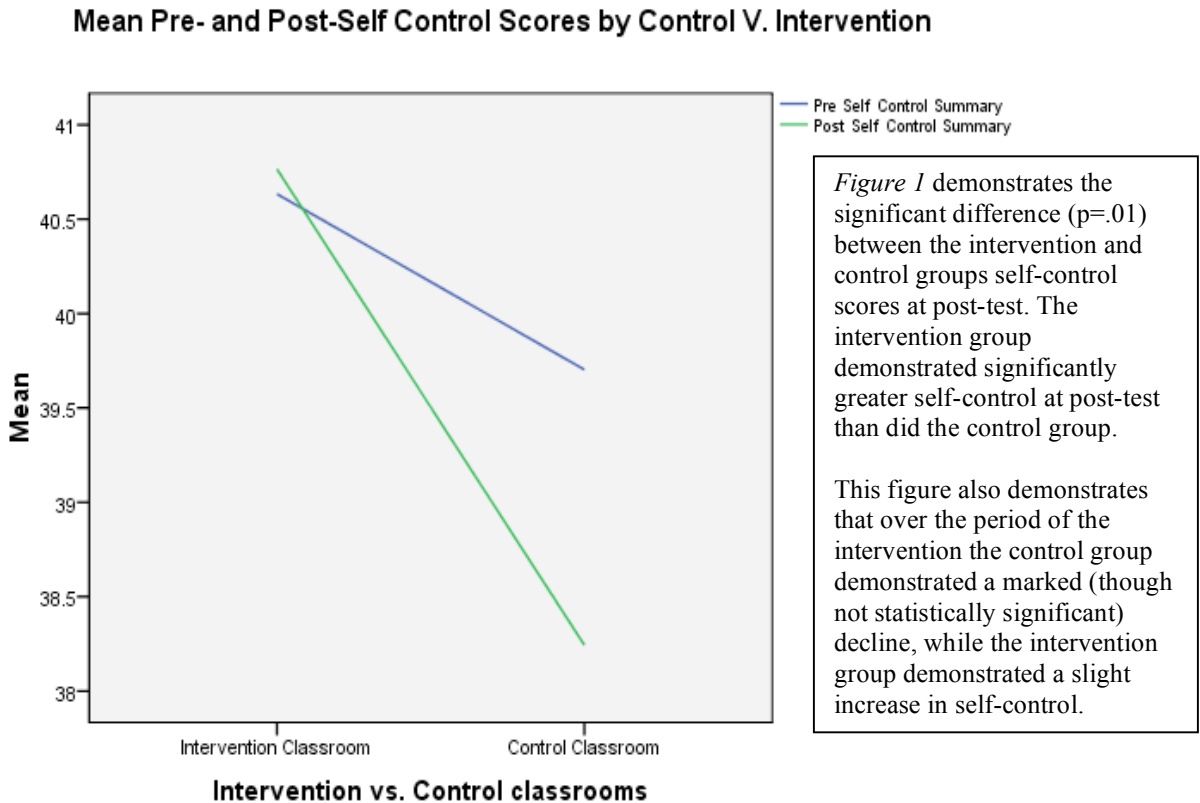
***: scale not utilized during this data collection

There are several findings that are of particular note:

SELF-CONTROL

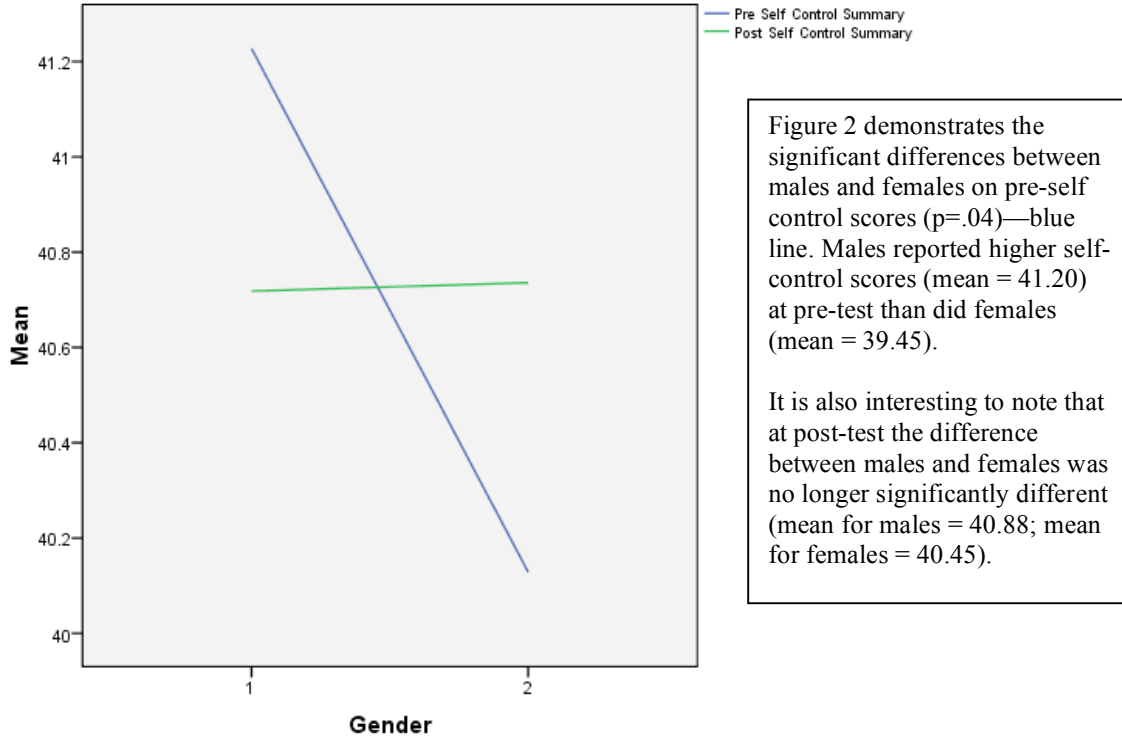
1. T-test analysis revealed significant differences between the intervention and control groups' post-perceived self-control scores ($t = 2.580$, $P = .01$). *The mean self-control score of the intervention group (mean = 40.61, SD = 7.81) was significantly greater than the mean self-control score of the control group at post-test (mean = 37.60, SD = 7.89)*—please see Figure 1.

Figure 1: Mean Pre- and Post-Self Control Scores by Control v. Intervention Groups



2. Although there was a slight increase in self-control scores within the intervention group from pre-test (mean = 40.63) to post-test (mean = 40.76), the change was not statistically significant ($t = -.34$, $p = .74$). This is a promising trend, however, particularly given the program was conducted for only 18 weeks.
3. Within the intervention group, significant differences were determined between males and females on pre-self control scores ($t = 2.03$, $p = .043$), with males reporting greater self-control (mean = 41.20) than females (mean = 39.45)—please see Figure 2. There were no significant differences between males and females on post-self control scores ($t = .49$, $p = .62$).

Figure 2: Pre- and Post-Self Control Scores by Gender (1=Male; 2=Female)



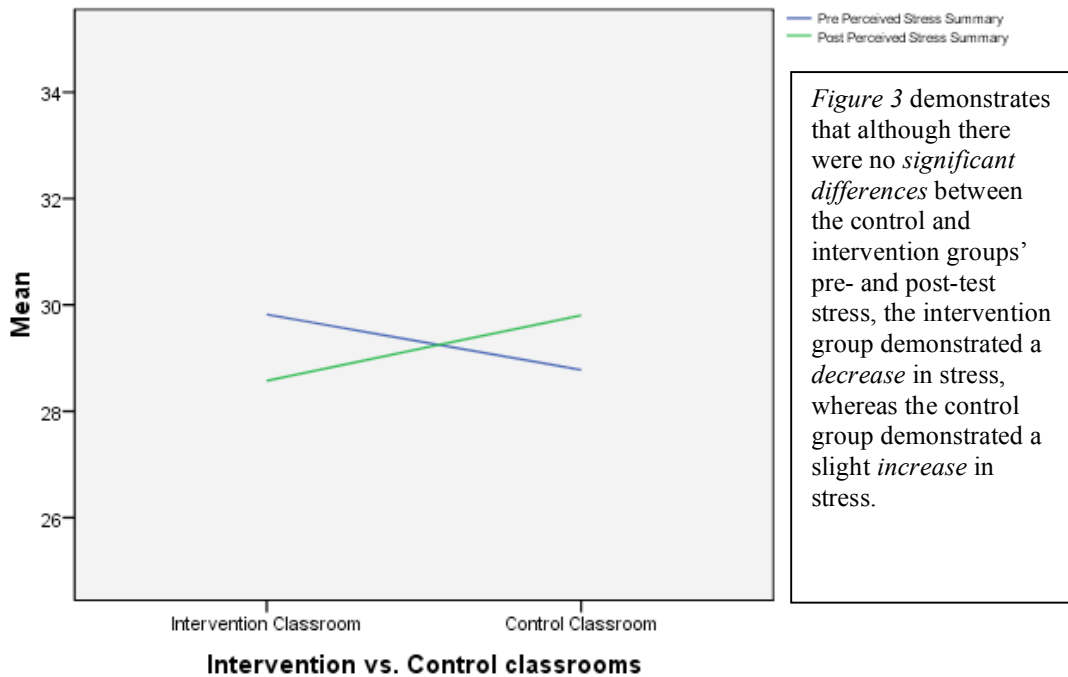
4. Paired sample t-tests determined no significant differences found between males ($t=.81$, $p=.42$) and females ($t=-1.23$, $p=.22$) on pre-to-post-self control scores within the intervention group; however, it is interesting to note that over the course of the intervention females were able to increase mean self-control scores from 39.45 to 40.45. And, although not a statistically significant change, it is a promising trend.
5. Paired sample t-tests conducted for the control group (only), yielded no statistically significant differences between pre- and post-test self-control scores ($t=1.269$, $p=.213$).
6. Within the intervention group, potential differences between self-control by the number of TLS classes delivered were explored via a One-Way ANOVA. There were no significant differences between the # of classes delivered and pre- ($F=.52$, $p=.67$) or post-test ($F=2.09$, $p=.10$) self control scores.

PERCEIVED STRESS

7. T-test analysis revealed *no* significant differences between the intervention and control groups' post-perceived stress scores ($t= -.66$, $P = .51$). Although there were no *significant differences* noted, the intervention group demonstrated a *decrease* in stress, and the control group demonstrated a slight *increase* in stress—please see Figure 3.

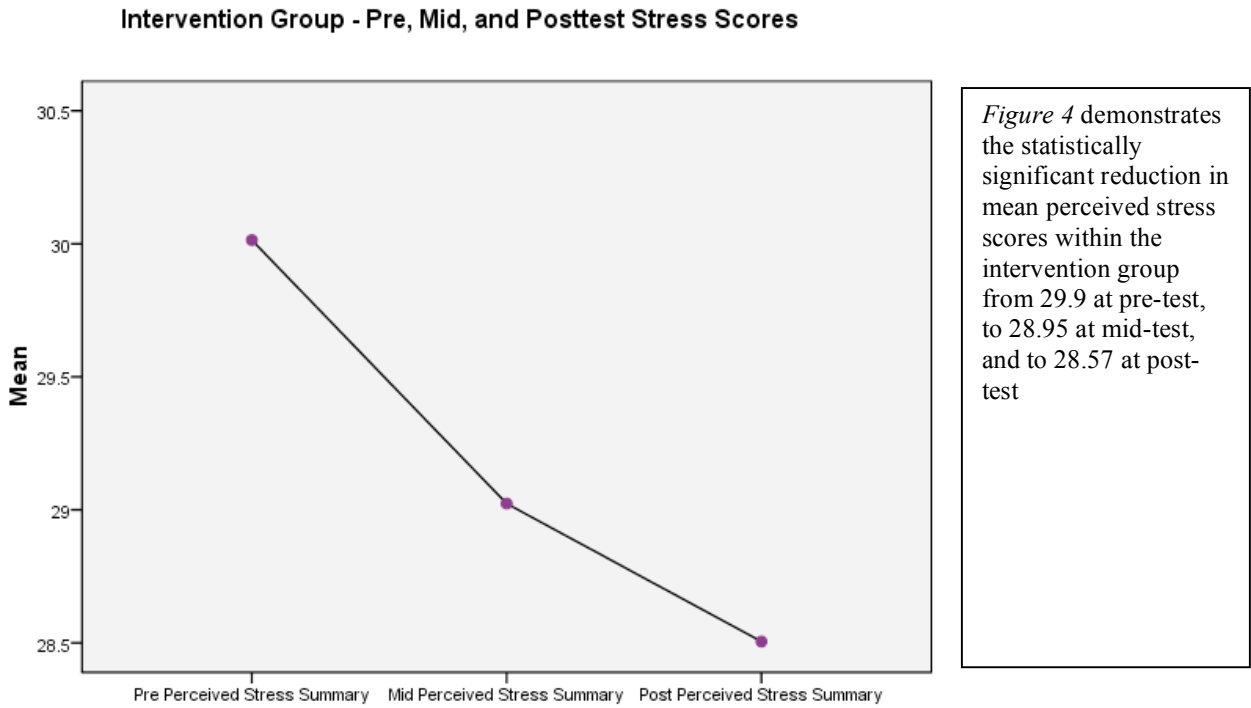
Figure 3: Mean Pre- and Post-Perceived Stress Scores by Control v. Intervention Groups

Mean Pre- and Post-Perceived Stress Scores by Control V. Intervention



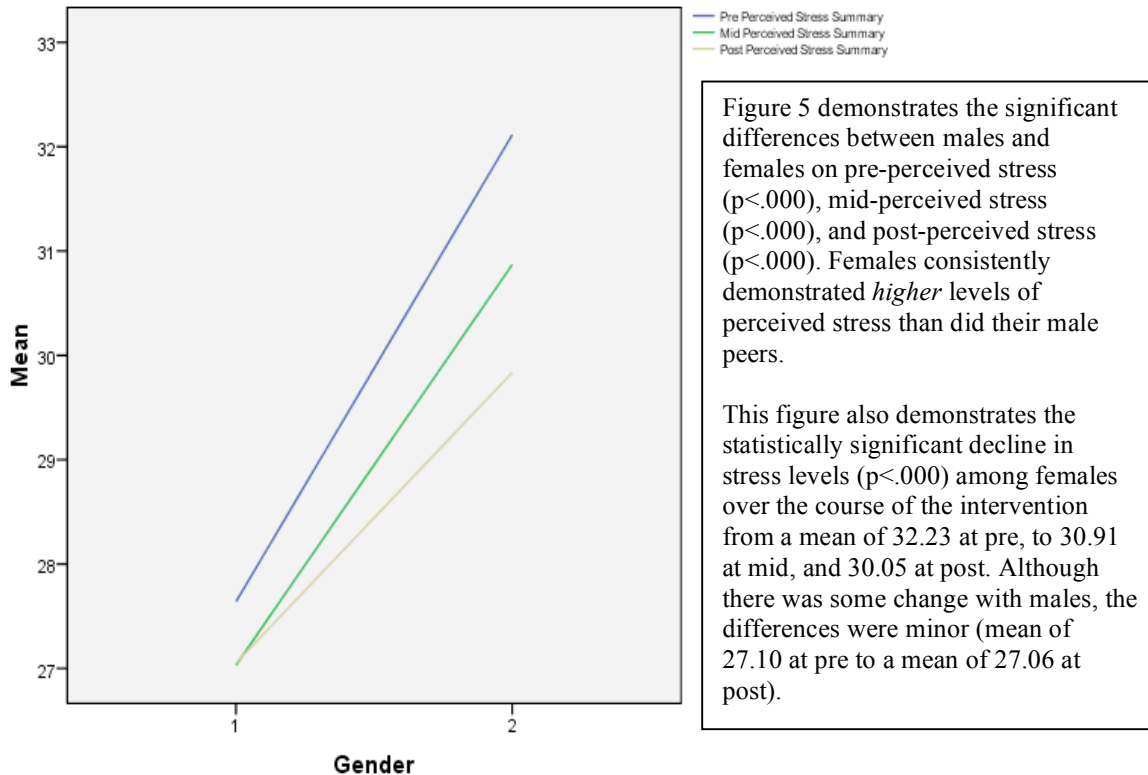
8. Paired sample t-tests conducted for the intervention group (only), yielded several significant differences.
- Pre-perceived stress scores were significantly greater ($t=2.985$, $p=.003$) than mid-perceived stress scores;
 - Mid-perceived stress scores were significantly greater ($t=2.029$, $p=.044$) than post-perceived stress scores;
 - Pre-perceived stress scores were significantly greater ($t=3.124$, $p=.002$) from post-perceived stress scores.
 - In general, therefore, the data demonstrate a statistically significant ($p < .05$) downward trend (reduction) in the mean perceived-stress scores within the intervention group from 29.9 at pre-test, to 28.95 at mid-test, and to 28.57 at post-test (please see Figure 4).*

Figure 4: Mean Pre-, Mid-, and Post-test Stress Scores for the Intervention Group



9. Within the intervention group, significant differences were determined between males and females on pre-perceived stress scores ($t = -7.58, p < .00$), mid-perceived stress scores ($t = -5.91, p < .000$), and post-perceived stress scores ($t = -4.42, p < .00$), with females consistently reporting higher levels of stress.
 - a. Females demonstrated a significant reduction in stress levels throughout the intervention— pre-stress scores were significantly greater than mid-stress scores ($t = 2.87, p = .005$), mid-stress scores were significantly greater than post-stress scores ($t = 32.93, p = .004$), and pre-stress scores were significantly greater than post-stress scores ($t = 3.48, p = .001$)—please see Figure 5.

Figure 5: Mean Pre-, Mid-, and Post-Perceived Stress Scores by Gender (1=Male; 2=Female)



10. Within the intervention group, potential differences within perceived stress by the number of TLS classes delivered were explored via a One-Way ANOVA.

- a. Significant differences between groups (# of classes delivered) for mid-perceived stress ($F=3.088$, $p=.03$) and post-perceived stress ($F=2.633$, $p=.05$) were obtained.
- b. Tukey's post-hoc tests were conducted to determine which groups differed significantly from the others.
 - i. For mid-perceived stress, those that received 1 class/week v. those that received 5 classes/week had significantly higher stress scores (mean difference = 3.11, $p=.05$).
 - ii. For mid-perceived stress, those that received 2 classes/week v. those that received 5 classes/week had significantly higher stress scores (mean difference = 2.97, $p=.03$).
 - iii. For post-perceived stress, those that received 1 class/week v. those that received 5 classes/week had significantly higher stress scores (mean difference = 3.37, $p=.05$).
- c. And, although no significant differences between control and intervention groups were noted for pre- and post-perceived stress, we did determine greater reductions in stress scores for those receiving 5 classes as compared to 3, 2, or 1 classes. It is reasonable to hypothesize that with additional exposure (dose) to the TLS program, students might demonstrate a statistically significant reduction in perceived stress.

11. Paired sample t-tests conducted for the control group (only), yielded no statistically significant differences between pre- and post-test perceived stress scores ($t=-.983$, $p=.332$) or pre- and post-test self-control scores ($t=1.269$, $p=.213$).
12. Within the control group, no significant differences were noted between males and females on pre-perceived stress scores ($t= -1.97$, $p=.054$), pre-self control scores ($t=.11$, $p=.91$), post-perceived stress scores ($t=-1.780$, $p=.081$), or post-perceived self-control ($t=-.408$, $p=.685$).
 - a. Although there were no significant differences within the control group, it should be noted that pre- and post-perceived stress scores (similar to the findings for the control group) were approaching significance at .054 and .081, respectively. It is reasonable, particularly given the small sample size of the control group, that these differences might be significant with a larger sample size (again, similar to the findings obtained with the current larger, intervention sample).

Qualitative Findings

During mid- and post-test data collection intervention students and their classroom teachers were requested to complete a short qualitative survey in addition to the self-control and stress items. Several themes emerged within these data. Among the students, there was overwhelming support for the program and many commented on the ways in which the TLS program had, specifically, helped them to “calm down,” “reduce stress,” and “focus.”

In addition to the students, many teachers commented on the ways in which the classes had helped them to feel “calm” and “relaxed.” Also, there were several comments regarding the ease of “adaptability to the classroom environment.” Please see below for several illustrative comments from the students and teachers.

15-minute Transformative Life Skills (TLS) sessions in the Classroom Feedback from Students at El Cerrito High School

"Love at first sight kind of thing, you know? It's a great idea and I really wish I could have had this in middle school." - Student, ECHS

"I like how they teach you skills and stretches that you can use whenever you want." – Student, ECHS

"Yoga is good for everyone!" - Student, ECHS

"I really like the TLS program. It helps a lot to calm me down and helps me refocus for class. It clears my mind of distractions and helps me focus on the importance of simple things." - Student, ECHS

"Since the TLS program, I have used the breathing methods I have learned when I am upset. It really helps to calm me down." - Student, ECHS

"Make it last longer (maybe even have a real class) more days doing it." - Student, ECHS

"I love it! It actually helps my stress level go down, at least for the day we have yoga. I think every so often we should do yoga the entire block and move all the desks away and bring mats." - Student, ECHS

"I think it has made me think of how I can control myself better in bad situations and think of ways to relax better." - Student, ECHS

"I really like the meditation that we do. I think that it calms me down, focuses me, and really makes my whole day a lot better." - Student, ECHS

" This class is very cool and helps a lot. I wish the class were longer though." - Student, ECHS

"I like the fact that we can stop whatever is going on at the time and just come to a peaceful mind state afterwards." - Student, ECHS

"I like how it takes away stress, or rather, how it helps me take away the stress. This program is helping me deal with nervousness." - Student, ECHS

"I think it's very good for me cause it's really help me clear out my mind and forget all the bad things and start over. And it really help me calm down when I am sad or stress out. I love every part of it because I been going through a lot in my life and this program make me feel good when I close my eyes and take a deep breath." - Student, ECHS

"I have found yoga to help me find a peaceful place within myself. I am very grateful for this and am glad when we have yoga in class." - Student, ECHS

"PLEASE pursue your school sessions, they make a big difference in making people more happy, more calm, and more lively." - Student, ECHS

**15-minute Transformative Life Skills (TLS) sessions in the Classroom
Feedback from teachers at El Cerrito High School
and Teachers for Social Justice Conference (San Francisco, Fall, 2008)**

"Yoga in class provided a calming, relaxing, and overall positive experience."

"I believe everyone should do yoga, everyday! This experience hopefully changed some minds amongst our youth. Thank you so much!"

"I like that yoga can be adapted to the classroom environment... This is a good lesson for the students to learn early in life."

"The instructors are wonderful. Flexible. Instruction with the kids is great."

"I am seeing the beneficial effects of TLS on my students; I feel inspired to apply yoga in my life."

"The quiet meditation seems to work especially well."

"I think it's a great program overall, and wonderful to expose the kids to it."

" I appreciate stepping back for a moment to take on a role as a co-learner rather than teacher."

“Something I can use for myself and for my students on Thursday.”

“Helped me! Made me more aware of my own feelings and thoughts. Calmed me way down!”

“I loved the positive, calm and flexible approach to today's training. I've come away from it with some new ideas of how I might use this in the classroom, and enough training to feel reasonably confident leading it on my own. I also appreciated the ever-needed reminder to take care of myself.”

“I appreciated the whole presentation. I learned, and I had refreshing physical activity. The idea of implementing this regime district-wide is great – I hope it comes to fruition. I also appreciated the intellectual connection BK made between the physical and emotional condition – very humane!”

“Starting with ABC (mindful Action, Breathing, Centering) – getting myself focused; taking home a yoga DVD I can use! Showed me how to use it in the classroom.”

“Really showed me how it is realistic in the classroom. Calm, peaceful way to unwind after class.”

“Very simple practices that I can do. Hope for future success to find out who I am.”

“Felt nurtured. Taking care of myself first! Want to apply to myself and my class.”

“I really liked how it was immediately useful. It can be applied today.”

“Relevant, useful, practical; created HOPE!”

Overall Summary

Over the course of the 18-week TLS program, the qualitative and quantitative data demonstrate the positive impacts of the TLS program. Regarding self-control, the intervention group demonstrated significantly greater ($p=.01$) self-control at post-test than did the control group. This is particularly interesting when we examine that over the period of the intervention the control group demonstrated a marked decline in self-control, while the intervention group demonstrated a slight increase in self-control. It is reasonable to hypothesize, therefore, that the TLS program might serve as a protective factor for self-control. That is to say, those students who receive TLS are able to maintain and/or increase self-control, as compared to a marked loss in self-control (over the same time period) among those who do *not* receive it. Also of interest was the finding that over the course of the intervention females were able to increase their mean self-control scores to a level comparable to their male peers.

Regarding perceived stress, we determined that although there were no significant differences *between* the intervention and control groups' on post-test stress ($t= -.66, P = .51$), the data demonstrate a statistically significant ($p < .05$) downward trend (reduction) in the mean perceived-stress scores within the intervention group from 29.9 at pre-test, to 28.95 at mid-test, and to 28.57 at post-test. Also, within the intervention group, significant differences were determined between males and females on pre-perceived stress scores ($t=-7.58, p<.00$), mid-perceived stress scores ($t=-5.91, p<.000$), and post-perceived stress scores ($t = - 4.42, p<.00$), with females consistently reporting higher levels of stress. *And*, females demonstrated a significant reduction ($p<.00$) in stress levels throughout the intervention (pre-mid, mid-post).

Finally, the data revealed significant differences between the # of TLS classes delivered and perceived stress at mid-test ($p=.03$) and post-test ($p=.05$). In particular, reported stress among students who received 1 or 2 classes/week was significantly *greater* than those who received 5 classes/week. At post-test, those students receiving 1 class/week reported significantly greater stress than those receiving 5 classes/week. Although these findings are preliminary (and would, therefore, need to be replicated), they suggest that initially—during the first 9 week segment—the greatest impact on reducing stress is experienced with the receipt of 3 or more classes/week; however, the impact of a greater quantity of classes appears to taper off at post-test—during the second 9 week segment—, suggesting that after the initial “high dose inoculation” a “maintenance dose” of 2 or more classes/week yields positive results.

Given the quantitative findings indicating; the feedback from students indicating the TLS program helped them to “calm down,” “reduce stress,” and “focus;” and, teacher feedback suggesting that the program was easily “adapted to the classroom environment” and helped them to feel “calm” and “relaxed” it is clear that the TLS program is positively impacting student self-control and stress.

Next Steps

Although we were unable to obtain these data prior to current analyses, El Cerrito High School will be sharing SASI data on the following:

- Attendance - tardiness and absences
- Discipline – referrals to the Principal, behavior problems, fights, suspensions
- Academic achievement – GPAs; math and reading scores

Further analyses will be conducted to explore associations between stress, self-control, attendance, discipline, and academic achievement, in addition to exploring the impact of the TLS program on these three academic-related metrics. Once these data are obtained and analyses are conducted, the findings will be added to the current report of findings.

Implications

There is plenty of evidence in the literature that stress and self-control affect academic potential, psychopathology, binge eating, substance abuse, affect regulation and interpersonal relationships (Tangney et al).

Our analysis shows that a short but frequently applied Transformative Life Skills (TLS) protocol in the classroom—a multi-modality intervention integrating yoga, breathing techniques and mindfulness—can systematically decrease stress and increase self-control in high school students. Additionally, training school teachers and institutional staff in these same interventions should help with their stress management, resilience, self-nurture and the ability to function from a more optimal state.

Pervasively applied in a community (high schools and their feeder middle and elementary schools) over a sustained period (K-12), there is potential for this type of program to be a front-line prevention and early intervention strategy with a possibly profound impact on education, violence prevention, and public and behavioral health.

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Effects of Daily 15-minute Yoga Protocol on Academic and Psychosocial Measures in Inner City Classrooms

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Keywords: Yoga, Education, Academic Potential, Stress, Self-Control

Objective: One in 10 US schools are considered by researchers to be dropout factories (Balfanz et al, Johns Hopkins University, 2006). Each high-school dropout over his/her lifetime costs the nation \$260,000 (Rouse, Princeton University, 2005). We hypothesized that a 15-minute yoga protocol administered regularly in inner city classrooms would help students to: 1) reduce stress and 2) increase self-control or resiliency, preparing them to learn with focus, attention and engagement.

Methods: We are bringing a 15-minute Transformative Life Skills (TLS) protocol, a multi-modality intervention including yoga, breathing techniques and meditation, into 15 classrooms at El Cerrito High School for this Fall semester of 18 weeks, with frequency varying from once to five times/week. Two psychometric tools: PSS10 (10-point Perceived Stress Scale) and TBSCS13 (13-point Tangney Brief Self-Control Scale), are being administered at the beginning and end of the semester, and a mid-semester snapshot consisting of PSS10 and a qualitative survey for students and teachers in all 15 classrooms (n=600), as well as 3 classrooms which are not getting yoga (control). Individual changes in each psychometric measure, as well as means per classroom (high-performing classrooms and low-performing classrooms) with varying frequency are being compared with those who never received the yoga using ANOVA. Additionally, four academic metrics are also being correlated: tardiness, absenteeism, suspensions and GPA.

Results: Our TLS programs with incarcerated youth have shown statistically significant decline in stress and increase in self-control and self-awareness (Kubo & Bose, SYTAR 2008; Bose & Philipp, SYTAR 2007). Analysis of data comparing the pre-semester and post-semester information indicates favorable changes in both stress and self-control, and compellingly positive qualitative feedback from students and teachers during the mid-semester span-shot.

- The intervention group significantly increased in their reported self-control as compared to the control group.
- The data demonstrate a statistically significant ($p < .05$) downward trend in the mean perceived stress scores within the intervention group from 29.9 at pretest, to 28.95 at mid-test, and to 28.57 at post-test.
- Females demonstrated a consistent decline in stress levels throughout the intervention.
- We determined greater reductions in stress scores for those receiving 5 classes as compared to 3, 2, or 1 class(es) per week.

Conclusions and follo-up: This program approach is unique, the sample size is significant, the methodology is robust and the social impact of this research is substantial. Results of the data analysis indicate that this 15-minute yoga protocol in the classroom reduced stress and increased self-control. We intend to correlate this data to academic metrics including attendance (tardiness and absences), discipline (referrals and suspensions) and grades (GPA).
