Research Proposal

Hope and Achievement for Depressed Adolescents

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Introduction

Previous studies have established that depression correlates with reduced hope (Snyder et al, 1996) and a measure of increased hopelessness is highly predictive of negative outcomes in depressed adolescents (Curry et al, 2006). It is important to note that a lack of hopelessness does not significantly correlate with having hope, or in other words, simply not being hopeless does not mean a person is filled with hope (Snyder et al, 1996). Literature confirms that hope is not an indication of intelligence, but hope does correlate with a higher scholastic self-perception, improvements in achievement (Snyder et al, 1996), and better school performance in subjects ranging from language skills, math, and science to art and design (Ciarrochi, Heaven, and Davies, 2007).

Students with depression perform more poorly in academics and scholastic achievement (Kovacs and Goldston, 1991). Depression is characterized by a reduction in motivation, which seems to correlate with reduced hope, and is associated with difficulty in engaging in learning tasks that require effort on the part of the learner (ibid). Conversely, elevated levels of hope in an adolescent indicate that he or she is more confident about controlling their destiny (agency) and better able to find ways to achieve their goals (pathways; Snyder et al, 1996). Over the course of a year-long analysis, higher levels of hope in adolescents have been shown to predict elevated levels of "global life satisfaction" as well as an improved capability to foresee and cope with significant life stress (Valle, Huebner, and Suldo, 2006).

The Office of Disease Prevention and Health Promotion (ODPHP) report that only 68.9 percent of children with mental health problems received treatment in 2008 (ODPHP, "Mental Health and Mental Disorders: Objectives"). The ODPHP oversees the establishment of the mental health initiatives for Healthy People 2020 (HP2020). A leading health indicator of HP2020 is to "Reduce the proportion of adolescents aged 12 to 17 years who experience major depressive episodes (MDEs)" as well as the goal to "Increase the proportion of children with mental health problems who receive treatment" (ibid). The purpose of this research proposal to look beyond the treatment of depression as a remission of negative symptoms and to focus on enabling an adolescent to formulate hope for a better future, consider pathways to attain that future, and gain the motivation to achieve his or her ideal future.

List of Abbreviations:

ANOVA = Analysis Of Variance	IQ = Intelligence Quotient	RDoC = Research Domain Criteria
CBT = Cognitive Behavioral Therapy	NIMH = National Institute of Mental Health	TADS = Treatment for Adolescents with Depression Study
CDI = Children's Depression Inventory	ODPHP = Office of Disease Prevention And Health Promotion	WIAT = Wechsler Individual Achievement Test
CHS = Child Hope Scale		
HP2020 = Healthy People 2020		
ibid = In the same source as previous		

Specific Aims and Experimental Hypotheses

It is the goal of this research proposal to give attention to the positive outcomes of treating depression in adolescents, namely hope and achievement, in correlation with diminishing the negative symptoms of depression. This research proposal is placing emphasis on increasing an adolescent's self-perception of being generally capable and improving his or her ability to perceive a hope for achieving goals while experiencing improved achievement outcomes. As quoted from Weisz, Doss and Hawley (2005), "*Youth treatment research needs to examine intervention impact in ways that go beyond assessment of the specifically targeted youth symptoms and diagnoses*."

This would be an exploratory project that anticipates discovering correlations between depression treatment and changes in the positive constructs of hope and achievement. The null hypothesis would be that neither cognitive behavioral therapy (CBT) with placebo nor CBT plus pharmacotherapy will result in a statistically significant change in hope or achievement. The alternate hypothesis of this research proposal is that treating depression in adolescents will improve a measurement of hope as compared to baseline and that an increase in hope will correlate with an improvement in academic achievement scores. Whereas previous research has found that 12 weeks of pharmacotherapy plus CBT results in a statistically significant recovery from depression symptoms compared to CBT alone in depressed adolescents (Vitiello et al, 2006), we can discover if there is a similar difference between medication and placebo for response in measures of hope and achievement.

Experimental Design

Adolescents (12 through 15 years of age) with a diagnosis of moderate to severe depression would be referred to the study by physicians or psychiatric clinicians. The adolescent should not have received any treatment for depression (therapy sessions or pharmacotherapy) within one year prior to study admission. A control group comprised of adolescents within the same age range and unaffected by depression would be recruited within the geographic location of the other research subjects. Recorded baseline characteristics of all research subjects should include age, gender, ethnicity, geographical location, and a measure of socioeconomic status (such as a yes/no response for "qualifies for free school lunch"; list of baseline measures determined from Weisz, Doss and Hawley, 2005). A measure of verbal intelligence (such as the Wechsler Intelligence Scale for Children) will need to be administered to screen adolescent's testing capability (a test indicating an IQ equivalence of < 80 will exempt a subject from the

study). Baseline testing (Time 0) would include a measure of depression symptoms (Children's Depression Inventory [CDI]), hope (Child Hope Scale [CHS], a simple validated 6 question test, contents of the test can be seen in Appendix 1), and achievement (Wechsler Individual Achievement Test [WIAT]). A subject in the control group should score less than 17 on the CDI to be included in the study (17 or higher on CDI is correlated with depression; Craighead, Curry and Ilardi, 1995). Adolescents with depression would be randomized between two blinded active intervention arms: 1) CBT with pharmacotherapy and 2) CBT with placebo. Following the treatment protocol of the Treatment for Adolescents with Depression Study (TADS), active treatment (pharmacotherapy and placebo) will start with 10mg of fluoxetine (or placebo) for seven days then increase the dose to 20mg daily until day 28 of the study; after day 28, the dose can be increased by 10mg increments up to a maximum dose of 40mg (Kennard et al, 2009). The study would run for 84 days (12 weeks). At 42 days (Time 1), a reassessment of hope (CHS) would be administered. Measures of hope (CHS) and achievement (WIAT) would be repeated for all research subjects at study end (Time 2) as well as a measure of change in depression symptoms (CDI) for the active treatment groups.

Planned Data Analysis

Once all data is accumulated for our three groups (CBT + fluoxetine, CBT + placebo, control), all values will be entered into an Excel spreadsheet. First, a repeated measures ANOVA test will be used to determine if there was response to treatment (improvement in depression symptoms) in each of our active treatment groups. Then, a repeated measures ANOVA test will be used to determine if there is a statistically significant response in measures of hope and/or achievement by comparing each group at Time 2 with Time 0 (and Time 1 for assessing changes in hope). We can further investigate the significance of change in hope and achievement by using one-way ANOVA to compare means in each measure between the treatment groups and the control group. A further one-way ANOVA test can be performed to determine if there is a statistically significant difference in response between our two active treatment groups. We will also determine a coefficient of determination (r^2) and correlation coefficient (r) for changes in depression (CDI) and hope (CHS), depression (CDI) and achievement (WIAT), and hope (CHS) and achievement (WIAT).

Power Estimation / Sample Size Determination

Using averages from 10 previous samples, an expected CHS mean score pre- and post-intervention could be estimated as 25.6 and 27.3 respectively (Snyder et al, 1997; Valle, Huebner and Suldo, 2006). The range of sample standard deviations is 3.01 to 6.11 (ibid). Using an alpha of 0.05 and an average standard deviation of 4.56, we estimate a need for 113 subjects per group to exceed an 80% power to detect a difference of 1.7 points. We would estimate the need to account for a 15% loss to follow-up in this type of study, so we would recruit 133 subjects for each group. An average WIAT score for similar youths dealing with mental health issues is 93.0 with a standard deviation of 14.0 (Jensen et al, 2001). If we assume that we can retain 113 subjects per group, this study would be able to detect a change in mean WIAT score of 5.22 points at an 80% power and alpha of 0.05. Based on the assumption that depression and hope are not correlated with a decrease in student capability, along with the fact that a score of 100 is considered an average score on WIAT, we would hope to observe a change of approximately 7 points to reflect the adolescents' return to the population mean (Wechsler Test, "What's A Good Score…"). In total, 266 adolescents would be recruited for the active treatment groups (randomized to 133 subjects receiving medication and 133 placebo) and 133 adolescents will be recruited for the control group.

Expected Outcomes and Potential Problems

Since there is a built-in expectation that approximately 20 subjects will be lost to follow-up from each group for various reasons, it is my intention to record the losses and possible reasons for the losses and omit those individuals' tests from analysis while maintaining the > 80% power of the study.

The choice to have a blinded pharmacologic treatment of depressed adolescents is to determine if medication improves the positive attributes of hope and achievement or if medication simply lessens the negative symptoms of depression. Based on literature analysis, there is no expectation of whether there will be a difference between CBT + medication or CBT + placebo. It would be expected that intervention will result in an increase in hope (Snyder et al, 1997). Medication usage and therapy have been shown to positively affect achievement (Jensen et al, 2001), but again, there is no expectation whether CBT + medication will be significantly different than CBT + placebo. As with previous studies, it is expected that both active treatment groups will be safely managed and will significantly improve according to depression symptom analysis (Kennard et al, 2009; Vitiello et al, 2006). However,

pharmacotherapy is not without risk (Weisz, McCarty and Valeri, 2006) and we need a better understanding of the potential benefits, or the possible lack of benefits, the addition of medication poses for adolescents.

Estimating an 80% power has a 23% chance of resulting in an underpowered result in this type of study (Tavernier and Giraudeau, 2015). However, to minimize risk in an adolescent population, I have chosen to keep power estimation at 80% while factoring in an extra 20 subjects per research group to conservatively account for potential loss to follow-up.

It is difficult to quantify a clinically meaningful change in scores for hope (CHS) or achievement (WIAT). A normal score range for WIAT is 90-109 (Wechsler Test, "What's A Good Score…"), and our assumption is that the mean score of all three research groups will fall within that normal range at both Time 0 and Time 2. Our expectation is that we will be able to discover a statistically significant increase in WIAT scores for our active treatment group and that we will be able to correlate changes in hope with the observed change in achievement scores. In similar fashion, we expect to negatively correlate meaningful changes in depression (CDI) with changes in hope (CHS, as depression decreases, hope will similarly increase). Even in the potential absence of statistical significance, it would be my desire to increase general awareness of adolescent mental health and their varying levels of hope and ambition to achieve. As a society, we need to give all adolescents the best chance to succeed.

Discussion and Commentary

From an adult perspective, we can probably all recall times in our lives where feelings of hope may have been high and we had an overall positive outlook on life. We can also recall times when hope seemed absent and the future felt like a burden. As adults, we have learned coping mechanisms for getting past our obstacles and we can continue to achieve our daily tasks. Adolescents do not have the same life experience of coping. If there is an added factor of depressive disorder, an adolescent can fall behind academically (Kovacs and Goldston, 1991) and he or she is significantly less likely to participate in sports, hobbies and other social activities (Olfsen et al, 2003).

The National Institute of Mental Health (NIMH) has been undergoing an effort to establish a new research framework for studying mental disorders called Research Domain Criteria (NIMH, "Research Domain Criteria (RDoC)"). Within this framework, psychiatric constructs like "fear," "anxiety," or "effort valuation" are associated within a framework of psychiatric systems (examples include "Negative Valence

Systems" or "Positive Valence System;" NIMH, "RDoC Matrix"). The construct of "hope" does not exist in the current RDoC Matrix, but NIMH does list "hopelessness" as a "self-reported unit of analysis" (NIMH, "RDoC Unit of Analysis"). Hopelessness has not yet been associated with another construct or a psychiatric system even though research has found that lower measurements of hopelessness were significantly correlated to positive outcomes in managing adolescent depression (Curry et al, 2006). As mentioned from the article from Snyder and associates (1997), the absence of hopelessness does not significantly correlate with the presence of hope. Despite over 20 years of research into the effects of hope and repeated validation of the Children's Hope Scale (Snyder et al, 1997; Valle, Huebner and Suldo, 2006; Ciarrochi, Heaven and Davies, 2007), hope does not seem to be getting any attention for NIMH research.

It would be an intent of this project to correlate depression treatments with a change in hope and differentiate between common forms of depression treatment to see if any treatment has a greater positive correlation with hope. Upon completion of this research, awareness of the importance of evaluating hope in adolescents should be further justified. To quote Ciarrochi, Heaven and Davies (2007): "*If youth are to be successful in an ever-increasing competitive global environment, it is essential that their academic achievements reflect their innate ability.*"

Please address all comments or questions to: Joseph Miles, jmiles3@oswego.edu

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Appendix 1: Children's Hope Scale (Snyder et al, 1997)

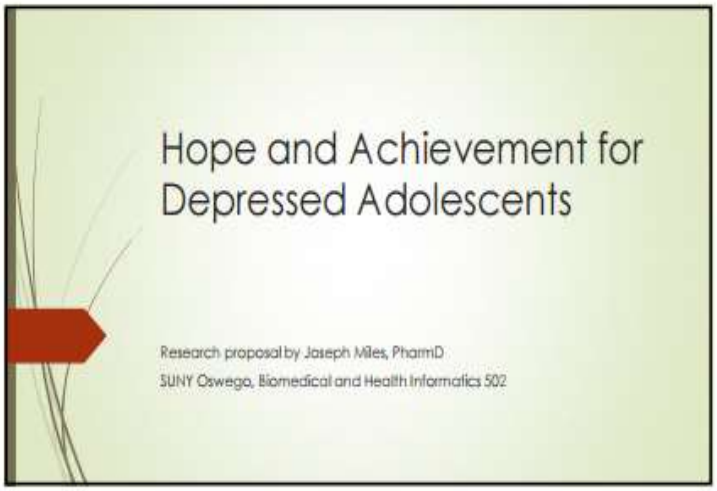
"Questions About Your Goals:"

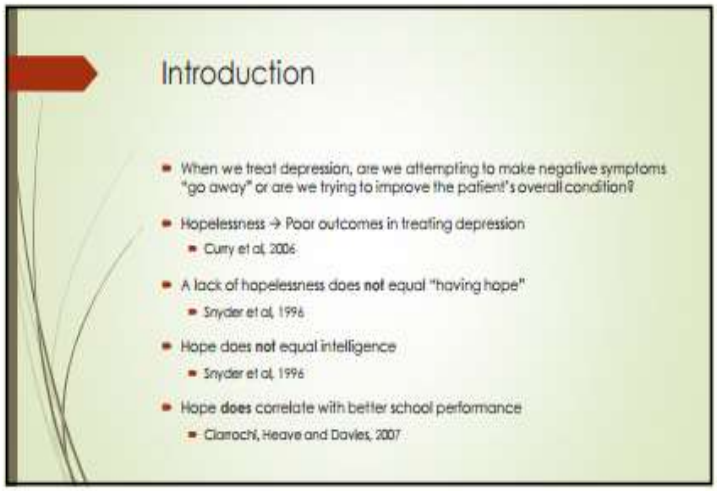
1. I think I am doing pretty well.
2. I can think of many ways to get the things in life that are most important to me.
3. I am doing just as well as other kids my age.
4. When I have a problem, I can come up with lots of ways to solve it.
5. I think the things I have done in the past will help me in the future.
6. Even when others want to quit, I know that I can find ways to solve the problem.

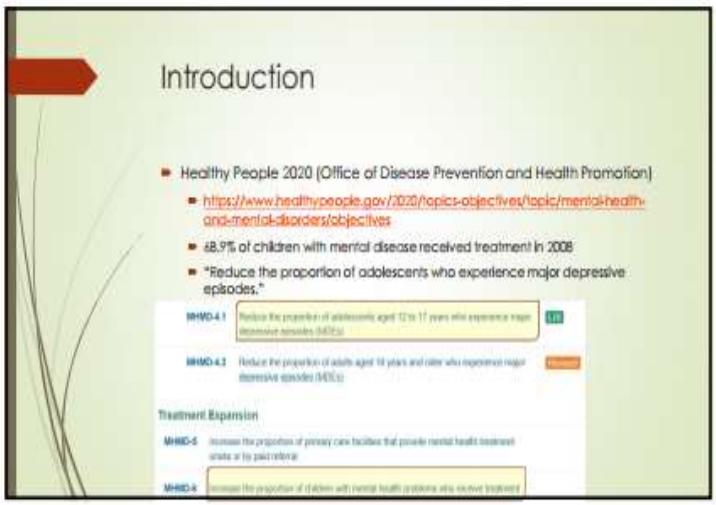
Options for the six questions:
1 = "None of the time"
2 = "A little of the time"
3 = "Some of the time"
4 = "A lot of the time"
5 = "Most of the time"
6 = "All of the time"

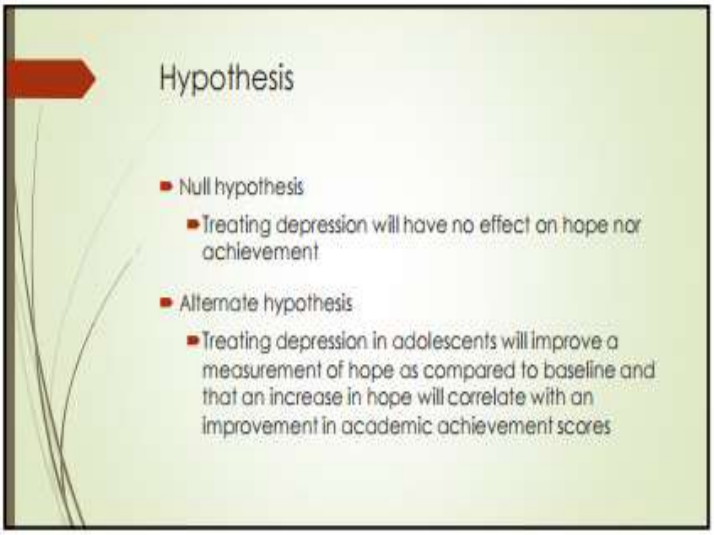
Questions 1, 3, and 5 are "agency thoughts." Questions 2, 4, and 6 are "pathways thoughts." Quoted from Snyder et al (1997): "Agency thoughts reflect the perception that children can initiate and sustain action toward a desired goal; pathways thoughts reflect the children's perceived capability to produce routes to those goals."

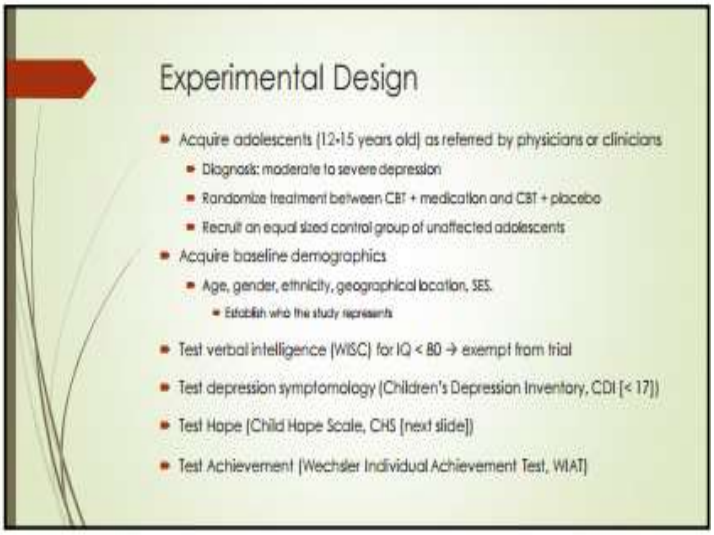
Appendix 2: Project presentation (slides 1-6), http://pi.cs.oswego.edu/~jmiles3/bhi/Adolescent-hope.pdf



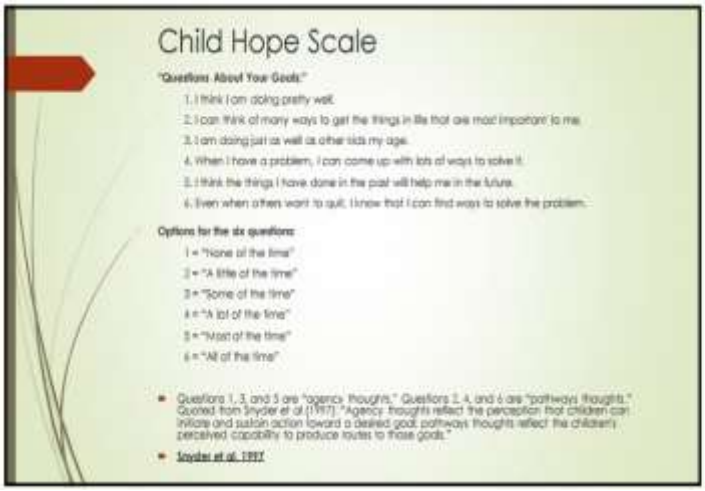


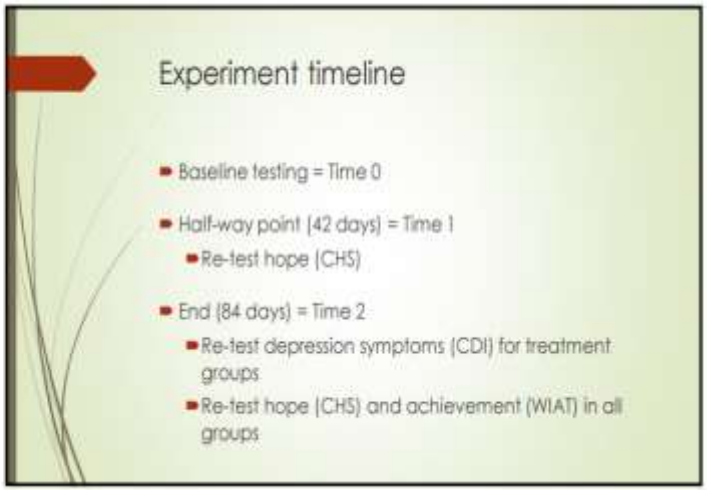


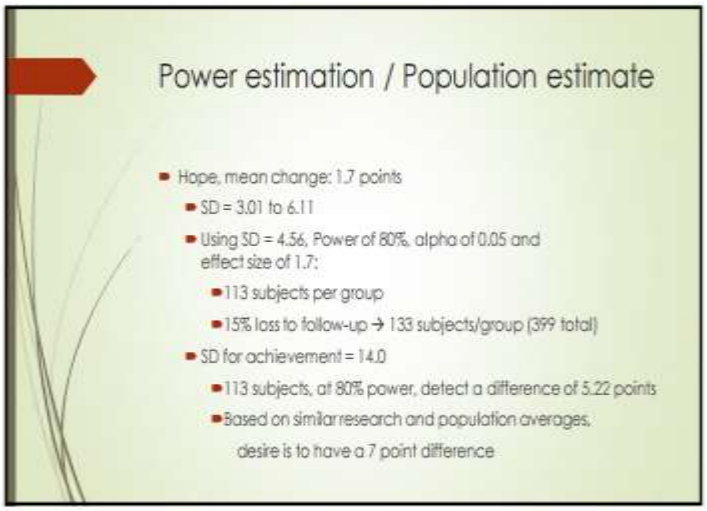


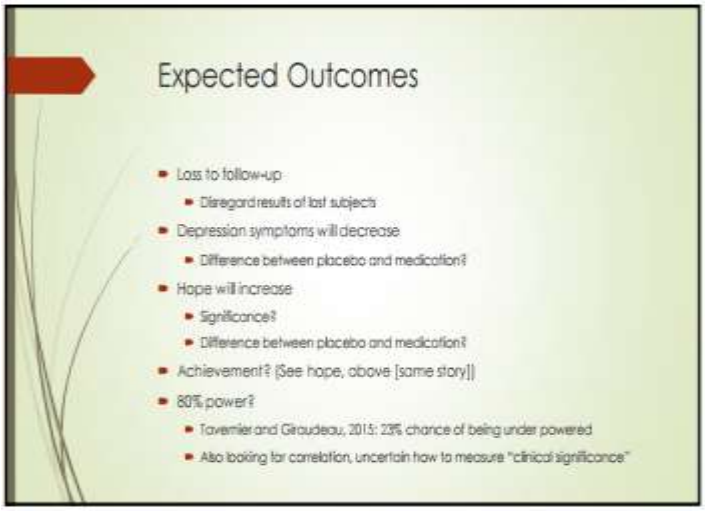


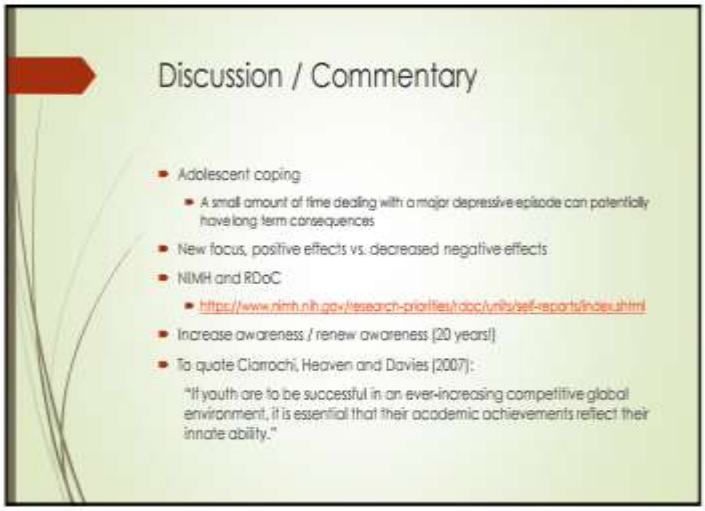
Appendix 2: Project presentation (slides 7-12),
http://pi.cs.oswego.edu/~jmiles3/bhi/Adolescent-hope.pdf











Appendix 2: Project presentation (slides 13-14), http://pi.cs.oswego.edu/~jmiles3/bhi/Adolescent-hope.pdf

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Any questions / comments?

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- Thank you!

Full presentation downloadable from: http://pi.cs.oswego.edu/~jmiles3/bhi/Adolescent-hope.pdf

A video presentation of the above slides can be viewed on YouTube: https://youtu.be/ZhCPmplUqUI