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**INITIATING, LEADING, AND
FEELING IN CONTROL OF ONE'S FATE:**

**FINDINGS FROM THE 2002-2003 STUDY OF NFTE
IN SIX BOSTON PUBLIC HIGH SCHOOLS**

Project IF: Inventing the Future
Harvard Graduate School of Education

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INTRODUCTION: PHASE TWO

During the 2002-03 academic year, Project IF (Inventing the Future) at the Harvard Graduate School of Education collected second-year data on a multi-year study of the National Foundation for Teaching Entrepreneurship (NFTE). The study is designed to address the role of NFTE in promoting the development of entrepreneurship, including entrepreneurial thinking and behavior. While a fair amount is known about how adult entrepreneurs think and act, little is known about how those entrepreneurial characteristics actually develop. Anecdotal evidence abounds regarding the activities adult entrepreneurs engaged in as children and youth, but virtually no systematic research exists that tracks the developmental processes of entrepreneurship from adolescence onward. This study is an attempt to begin addressing this twofold gap in different developmental literatures: the literature on the development of entrepreneurship, and the literature on adolescent and young adulthood development, which can be informed through studies of entrepreneurial training.

In phase one of our study (2001-02), we collected and reported on data from two large public high schools in Boston. In that phase, we found that NFTE students were more likely than Comparison group students to expand their college interests and occupational aspirations from pretest to posttest. In addition, NFTE students were more likely to increase their involvement in independent reading (non-school reading). These outcomes suggest clear implications for NFTE's impact not only as a *business entrepreneurship* training program, but also as a potential facilitator of broader educational and professional development. Furthermore, phase one indicated that Latino students may benefit from NFTE in particularly powerful ways. Most importantly, Latino students involved in our study of NFTE during 2001-02 showed an increased sense of connection to school, while Latino students in the Comparison group during that phase of our study declined in this area.

Phase two (2002-03) of the study builds upon the prior phase in a number of ways. First, we expanded the study to a larger number of schools and students, thereby allowing for the possibility to study NFTE in a broader range of learning contexts. There are

important implications derived from this expanded sampling, which will be presented below. In addition, this second phase incorporated some new instruments that allowed us to assess different factors potentially associated with NFTE's training and the development of entrepreneurship. Those instruments included a measure of entrepreneurially related activities (*Entrepreneurial Activities Checklist*) in which high school students can become involved. We also added a measure of Locus of Control, which has been found to be important in the adult entrepreneurship literature; this will allow us to assess whether NFTE promotes a greater sense of inner agency related to achievement and goal attainment, versus a belief that such outcomes are largely outside of one's control. Finally, we included four key scales from new national research on important contributions to healthy or positive development. Those scales assess originality, curiosity, industriousness, and hopefulness, all areas that we believe are related to entrepreneurship, and in which NFTE may have an impact.

Because of time constraints inherent to administering survey instruments in schools, our testing of new survey measures required that we delete others that were used in phase one of the study. We chose not to administer the ATOM (Across Time Orientation Measure) because it is particularly time consuming to administer, and we deleted the Personal Initiative survey from our phase two package because it overlaps with the industriousness scale and the locus of control survey. The analysis of data from the two phases of the study has allowed us to determine which instruments seem most powerful in detecting change that might be promoted through NFTE participation. This point is discussed in the implications section of the report.

PHASE TWO SAMPLE: THE SCHOOLS AND THEIR STUDENTS

As alluded to above, we targeted six schools for this second phase of our study. We selected these schools based on various factors. All had populations with similar demographics to the 2001-02 sample from East Boston High and Brighton High. We had hoped to return to both of these schools, but were not able to continue at East Boston High, due to the scheduling of the NFTE course across two academic years. (See Appendix A of 2001-02 Final Report for a detailed explanation of the East Boston data collection

constraints.) This was unfortunate, as East Boston High, a flagship NFTE school, would likely have provided the largest sample of NFTE and Comparison students. Our expansion into five other Boston public schools was, thus, not only desirable – a means of drawing from a larger pool of teachers and programs – but also a necessity in order to achieve a sample size comparable to the 2001-02 study.

Five of the six schools in the second phase were large Boston public schools, each of which had a strong relationship with NFTE. Only Brighton High stood on somewhat shaky ground with NFTE, but the benefits of collecting data for a second year at the school outweighed any potential drawbacks. The other large high schools with a NFTE history included: Charlestown High, English High, O’Bryant High, and West Roxbury High. It should be noted that O’Bryant High (John D. O’Bryant School of Mathematics and Science) is one of Boston’s three “exam schools,” which are magnet-type schools requiring an entrance exam. The sixth school in the sample was a small public charter school, Boston Evening Academy, which, as a Horace Mann Charter School, is included within the Boston Public Schools system (unlike typical charter schools). We decided to include Boston Evening Academy in the sample because, although the NFTE program was being taught there for the first time, NFTE staff believed the teacher and the school environment to be promising for the program.

All of the schools arranged for us to collect data in Comparison classes, which, in most cases, provided similar class sizes to the NFTE classes. Our major constraint in having these Comparison classes yield similar sample sizes was the return rate of permission slips. (See Page 9 of 11/15/02 Progress Report for more details on this constraint.) With the exception of Boston Evening, all Comparison classes involved courses taught within the same School-to-Career pathway as the NFTE class or classes with which they were paired. Comparison courses included web design, marketing, CISCO networks, and technology. The least comparable course was “Facing History and Ourselves,” a history and social justice curriculum taught in one of the Charlestown High Comparison classrooms.

In some schools we worked with multiple NFTE and Comparison classes, and in others we worked with just one of each. English High offers NFTE on a semester schedule, so at that school we collected data from one cohort of NFTE and Comparison students in

the fall semester and from a second cohort in the spring. In all, we collected data in 17 different classrooms across the six schools, and worked with 13 different teachers.

A final point relating to the Phase Two sample involves variations in sample size among the findings referenced in this report. First, while the total sample includes 268 subjects, not all of these students were present at both the pre- and posttest sessions – a requirement in measuring change over time. In addition, there is variation in numbers among the measures used, as not all students were able to complete the entire survey. Thus we see attrition as we move through the measures in the order in which they were administered: Entrepreneurial Activities Checklist, Values in Action, Hemingway Measure of Connectedness, and Nowicki-Strickland Measure of Locus of Control. English-language proficiency and reading ability were the most common factors in students not completing the entire survey, though distractedness and fatigue were also contributors.

Table A. provides a breakdown of the sample by school. Table B. presents the basic demographic information on the sample, as provided by the Boston Public School's School-to-Career office.*

Table A. Number of students per site

Boston Public School sample 2002-2003 (N=268).

	Boston Evening	Brighton	Charles-town	English	O'Bryant	West Roxbury	Total
<u>NFTE</u>	15	23	30	44	27	19	158
<u>Comparison</u>	13	18	21	17	17	24	110
<u>Total</u>	28	41	51	61	44	43	268

*Table B. A Demographic Profile of NFTE vs. Comparison students***Boston Public School sample 2002-2003 (n=268).**

	NFTE n=158		Comparison n=110	
	n	%	n	%
<i>Gender</i>				
Male	85	54%	62	56%
Female	73	45%	48	30%
<i>Race</i>				
African American	91	58%	46	42%
White	12	8%	2	2%
Asian	19	12%	20	18%
Latino	36	23%	41	37%
Other/No Response	0	0%	1	1%
<i>Other Statistics</i>				
Students Receiving Free/Reduced Lunch	109	69%	78	71%

*Demographic data for students from Boston Evening Academy was provided by the school, not the School-to-Career office.

FINDINGS FROM THE ENTREPRENEURIAL ACTIVITIES CHECKLIST

Over the past two years, the research team has constructed and piloted a measure named the Entrepreneurial Activities Checklist (EAC), aimed at measuring the entrepreneurial activity and engagement in youth. The survey is the result of focus groups conducted with Brighton High students—both NFTE and Comparison group students—whereby we established the different activities in which students can engage, regardless of whether they are interested in them specifically. The construction of this measure was motivated, in part, by a lack of appropriate measures in the field of youth entrepreneurship to assess entrepreneurship activity beyond the business realm.

The guiding question for this instrument was: How can we measure whether a student is developing an entrepreneurial attitude or behavior that is not related to business? While this question poses a tough methodological challenge, it is clear that youth develop interests in different domains, and perhaps it is precisely in those domains that their entrepreneurial attitude and behavior would be most apparent. Previous NFTE research found that while the program is successful in promoting subsequent business ownership, the vast majority of students will not pursue this professional pathway. Our qualitative pilot

research (observations of the programming, along with interviews of participants), however, suggested that even students who may never open or own their own business seemed effected by the entrepreneurial training. Therefore, our research, and this measure in particular, is designed to measure entrepreneurial attitudes and behavior more widely; specifically, we are interested in the multitude of arenas in which youth might engage in entrepreneurial attitudes and behavior.

The EAC is a list of 49 different activities organized around different domains and dimensions of potential entrepreneurship. Domains refer to the specific areas of engagement, such as arts and media, sports, trades, science, business, or religion. Dimensions refer to the ways in which student engaged in the different activities: *Starter* refers to activities whereby students build or improve structure or flow of an activity; for example, starting their own business, organizing a social event, writing plays, musical compositions or dance performances. *Leader* refers to activities within an existing structure, but those which students can improve or direct, or through which they influence others; for example, serving as an editor of a school or community publication, serving as a captain of a sports team, or persuading others to accomplish a positive shared goal. Finally, *Joiner* refers to activities in which students stay within an existing structure, but contribute through their performance; for example, being a member of a sports team, joining an existing club or organization, or participating in a dance or theater group. Joiner may be considered less classically entrepreneurial than Starter and Leader, but a trait of entrepreneurship is becoming active in the world, and this dimension is designed to capture that characteristic. For each domain, the EAC asks questions that establish whether the student engaged as a starter, leader or joiner.

The entrepreneurial attitude, therefore, could be measured by assessing whether students engage in different activities outside of class, and the extent and nature of their engagement. The EAC gave students four different choices for each activity. The choices capture both the reasons for and level of their engagement.

0: If they did not do it because it was not available to them (perhaps because it was not offered at their school or community, they did not know the activity existed, or they did not have access to it because of gender, race/ethnicity, or age.

- 1: If they did not participate because, although it was offered or available to them, they were not interested.
- 2: If they did the activity one or two times; in other words, whether they had simply tried it.
- 3: If they had engaged in the activity regularly or often.

When students circle a '0' response, we have no way of determining whether or not that activity was indeed not available to them, or whether they perceived that it was not available. By looking at changes in students' responses from pre to posttest, we are assessing their sense of opportunity and the extent to which interventions can influence its development. In theory, NFTE has the potential to help students recognize opportunities for developing business ideas, even among those who previously would have been unaware of those opportunities. For each activity included in the survey, no more than 40% of all students gave a '0' response. We believe this results from the set of activities that we chose, which are relevant to the lives of the youth in the sample.

All students receive an overall score for Entrepreneurial Behavior (EB), estimated by the mean of their responses to all the items; we score EB, and all subscales, on a standardized scale of 0-10. Students who provided more 2 and 3 responses got a higher score than those who tended to respond 0 and 1. EB reflects both engagement in different activities and the degree of commitment to those activities; that is, if students were not interested and marked mostly 1's, they would get a low score, while students who were interested and tried individual activities frequently got high scores. Students also receive a score for the different dimensions and for selected domains, again with a range of 0-10. We compared students' scores from pre to posttest, resulting in change scores for EB and its domains and dimensions. The first analysis focused on whether change from pre to posttest for both NFTE and Comparison students was statistically significant. The second analysis involved looking at the difference between the change scores of NFTE and the Comparison Group. This first step captures whether each group changes significantly from pre to posttest. The second step compares both groups against each other.

Differences from Pre to Posttest for both Groups

On the overall Entrepreneurial Behavior score, NFTE students changed substantially from pre to posttest. On our standardized scale of 0-10, NFTE students changed from 4.14 to 4.45. This change of 7.5 % was statistically significant ($p < .01$). NFTE students increased their participation in activities as Starters (8.5%) and Leaders (13.2%). Although the largest change was for the Leader dimension, changes in both dimensions were statistically significant (please see Table C. below). NFTE students did not improve in the Joiner dimension, which would be consistent with what NFTE's entrepreneurship model, which emphasizes starting businesses and related initiative-taking activities, as well as leadership development related to entrepreneurial activities.

In the different domains, NFTE students' scores in business, sports and arts-related activities increased significantly. The largest increase was in the business realm with a .54 (15%) increase. The only domain that declined was the general or more cognitively oriented domain, but this decline was not statistically significant.

In contrast to NFTE students, Comparison students did not change significantly from pre to posttest on overall Entrepreneurial Behavior or in any of the dimensions or domains. In some cases, the trend was to decline, as for example in the business, general, and sports domains.

Differences between NFTE and Comparison Students in Change Scores

To establish whether increases in the different scores are due to the program intervention, the difference in the change scores between NFTE and the Comparison students has to be large enough to be statistically significant. For the Starter dimension the two groups change scores were significantly different ($p < .05$). That is, for this dimension the difference in change scores of .29 was large enough to be statistically significant. Therefore, changes in the starter dimension can be attributed to the NFTE program. Likewise, the Business domain showed significant differences in change scores ($p < .01$) between NFTE and the Comparison group. In the other dimensions the difference in change scores between NFTE and Comparison groups was not large enough relative to the sample size to be considered statistically significant. If similar differences show up with

somewhat larger samples, the Leadership change score found for the NFTE sample would certainly reach significance. Finally, we did not find any gender differences between NFTE and Comparison groups for EB and the various domains and dimensions.

Table C. Entrepreneurial Activities Checklist – Change Scores & NFTE vs. Comparison

	Comparison (n=67)				NFTE (n=95)				NFTE vs. Comparison
	Pre	Post	Change	p-value	Pre	Post	Change	p-value	p-value
Total	4.01	4.05	0.04	n.s.	4.14	4.45	0.31	**	n.s.
<i>Dimensions</i>									
Starter	4.09	4.05	-0.06	n.s.	4.10	4.45	0.35	**	*
Joiner	4.36	4.42	0.03	n.s.	4.63	4.74	0.11	n.s.	n.s.
Leader	3.51	3.73	0.22	n.s.	3.71	4.20	0.49	***	n.s.
<i>Domains</i>									
Business	3.28	3.24	-0.08	n.s.	3.59	4.13	0.54	***	**
General	6.96	6.72	-0.24	n.s.	7.28	7.24	-0.05	n.s.	n.s.
Sports	4.25	4.07	-0.18	n.s.	4.85	5.27	0.42	*	~
Social	3.83	4.07	0.21	n.s.	3.94	4.20	0.27	~	n.s.
Arts	3.07	3.32	0.22	n.s.	3.14	3.47	0.33	*	n.s.

n.s. = *p*-value not statistically significant

statistically significant *p*-values (from least to most): ~ = *p*<.1; * = *p*<.05; ** = *p*<.01; *** = *p*<.001

Discussion of the EAC and NFTE's Impact

These results indicate that the NFTE students are changing in the dimensions that we could hypothesize the program would influence – the Starter and Leader activities. Likewise, they are changing in business and other domains. However, the significant differences between NFTE and the Comparison group occur only in the dimensions and domains in which we would hypothesize NFTE has the greatest influence: the Starter dimension and the Business domain.

Entrepreneurship attitudes and activity arguably result from a combination of context and attitude, or opportunity and personal disposition. In attempting to develop entrepreneurial activity, there needs to be a certain level of opportunity available for students. At the same time, interventions can promote within the individual a sense of entrepreneurship, or an entrepreneurial belief that ‘you can make things happen,’ even where opportunities may be relatively minimal. One might argue that NFTE addresses both sides of the entrepreneurial coin: the program creates an opportunity for learning entrepreneurial skills and practicing entrepreneurial behavior, while at the same time fostering an entrepreneurial attitude. Providing one side of the coin without the other would likely be less effective and not yield the results presented here.

LOCUS OF CONTROL FINDINGS

Locus of control reflects the extent to which people view the events and outcomes in their lives as being either within or beyond their control. While it is unrealistic to believe that everything we do and want is within our control (*internal locus of control*), prior research has consistently shown that people who generally are inclined to believe that their fate is largely in their own hands are happier and more productive than those who feel the opposite (*external locus of control*). If positive outcomes are largely linked to luck or chance, there is little motivation to improve one’s skills or work ethic. In other words, the application of effort toward achievement, goal setting and attainment, and skill development requires an adequate degree of an *internal locus of control*.

Because entrepreneurship requires a great deal of individual agency, locus of control has been shown among adult entrepreneurs to be an important attribute. Aggressive and successful entrepreneurship requires a belief in one’s capacity to meet the challenges set forth. It would be foolhardy to pursue entrepreneurial endeavors if one believed that the success of those efforts was due largely to chance. Therefore, we incorporated a measure of locus of control that can be used with high school students.

The *Nowicki-Strickland Measure of Locus of Control* has been developed for use with a range of ages and populations. We adopted it for our study because it is widely used and provides readily interpretable data that ultimately can be compared to national norms.

The results from this wave of data collection showed a strong favorable trend. Specifically, NFTE students began with marginally lower locus of control scores than the Comparison students, but increased by approximately 3% at posttest, thereby slightly outscoring the Comparison group. While this difference across the two groups was not statistically significant, the NFTE students did change many times more than the Comparison students: (.79 versus .14). With a somewhat larger sample, this trend would be significant.

In a more fine-grained analysis, we found that the locus of control findings were even stronger for immigrant students, or those born outside of the U.S. For this subsample, we found that immigrant students within the NFTE programming improved by approximately 4.5% in locus of control, while such students in the Comparison group declined by approximately 2.5%. This seven percent difference is quite substantial, and although it does not prove to be statistically significant in this study, it would be with a somewhat larger sample. In summary, then, the overall findings that show NFTE students improving more than Comparison students on locus of control are due in large part to the outcomes for immigrant participants. To confidently support these findings, further analyses are needed with larger samples of immigrant participants. The sample size here was quite small: of the total participants in our study who completed the Nowicki-Strickland at both pre and posttest, there were 31 immigrant students in NFTE, and 21 in the Comparison group.

Finally, in looking at school and teacher effects on locus of control outcomes, we found that both proved very important. For students at English High School, participation in NFTE was strongly associated with improved locus of control from pre to posttest (11% gain), while the reverse was the case for English High students in the Comparison group (4.5% decline). In a less dramatic, but also important outcome, NFTE students at O'Bryant High School improved marginally (1% gain), while their Comparison group peers declined substantially (7.7% decline). Upon examining the school effects more closely, however, we found that at English High, the students of one teacher showed extremely large increases in locus of control from pre to posttest (approximately 15% gain). What is most noteworthy here is that the teacher whose students showed this dramatic gain in locus of control was named the 2004 NFTE National Teacher of the Year and has received other recognition in

the past for her outstanding work as a NFTE instructor. This suggests that excellent teaching may be related to improvements in locus of control for NFTE students.

Table D. Summary of Locus of Control Findings

	Control (N = 68)			NFTE (N = 89)		
	Pretest	Posttest	Change (% ch)	Pretest	Posttest	Change (% ch)
NS Total	25.76	26.01	.15 (<1%)	25.68	26.47	.79 (3.1%)
U.S. Born	25.62	25.81	.39 (1.5%)	25.25	26.00	.75 (3.0%)
Immigrant	25.01	25.64	-.63 (2.5%)	25.24	26.39	1.15 (4.6%)

FINDINGS ON ADOLESCENT CONNECTEDNESS

Over the past two waves of data collection we have used the Hemingway connectedness scales as a means of capturing the impact of NFTE on the students' experiences of connectedness to school, to learning in general, and to other areas in their lives. The Hemingway was selected for a variety of reasons. First, our observations of NFTE suggested that the real-world, hands-on teaching approach was engaging for students and helped them connect with learning the entrepreneurial concepts. Our hypothesis was that this connection to learning through the NFTE course would be experienced as an important connection to school, and that it helped build connections to peers in the NFTE classes. The Hemingway assesses such forms of connectedness.

Results from the 2002-2003 school year generally were negative. That is, students participating in NFTE did not improve in overall connectedness, nor to experiences of connectedness in any of the separate domains (e.g., school, peer, teacher connectedness). In addition, the NFTE students generally did not show positive results relative to the Comparison group. In examining patterns of scores across the two groups, we see in Table D. below that the NFTE students show a slightly higher degree of overall connectedness than the Comparison students at pretest (3.55 versus 3.37), although this difference is not statistically significant. By posttest that difference is approximately cut in half, with the NFTE students declining a bit (from 3.55 to 3.46), whereas the Comparison students finished in a near identical place to where they started.

This picture suggests that for the Comparison students their school year was fairly stable; their scores across the overall scale and each of the dimensions show little variation. The NFTE group, on the other hand, shows a consistent marginal decline in connectedness. This is especially true for the friends, peers, school, and teacher subscales, which all show somewhat larger declines. This trend suggests that within the friendship and school domains the students seem to be facing particular challenges. As would be expected, NFTE, as an intervention of sorts, is not proving strong enough to counter these over-riding factors. We see further evidence of this pattern in some of the other findings that follow. The potential meanings for this trend are discussed in the implications section at the end of the report.

There are, however, two important contrasts to the general connectedness findings. First, there is a significant interaction between School and Teacher Connectedness. That is, at Charlestown High School, where NFTE is taught by a 2004 NFTE National Teacher of the Year award recipient, NFTE students' experiences of connectedness to their teachers improves from pre to posttest, while Charlestown High Comparison group students decline on teacher connectedness. In a related, but less dramatic effect, Comparison group students at Brighton High decline twice as much as NFTE students there from pre to posttest. At the other schools in the study, the Comparison group students fair better than NFTE students on teacher connectedness.

This teacher connectedness by school interaction is complex, given that NFTE students are not rating connectedness to their NFTE teachers only, but rather to all the teachers with whom they interact. It is especially powerful, then, that at Charlestown High, where there is reason to believe that NFTE is taught particularly well, improvements in teacher connectedness for NFTE students shows up as a powerful finding. Our hypothesis is that if students make a strong connection to their NFTE teacher this will have implications for their feelings of connectedness to teachers more broadly. More specifically, having a positive experience of connectedness in one class might encourage attempts at building connections with teachers in other classes. Clearly, more research is needed to test this hypothesis more definitively.

A second modification to the general connectedness findings is that for broad school connectedness (connectedness to teachers, classmates, and to learning), there is a

significant ($p < .05$) gender-by-NFTE interaction. This interaction effect shows that NFTE boys decline somewhat (-.62) in school connectedness, while Comparison group boys improve marginally (.15); in contrast, NFTE girls hold even in school connectedness (.01), while Comparison group girls decline somewhat (-.23). It is difficult to accurately interpret this interaction effect. But it is worth considering whether boys who participate in NFTE feel a stronger desire to get out into the world to make things happen, relative to Comparison group boys. For girls, on the other hand, it may be that NFTE is providing a way to connect with school; NFTE girls may not feel the same ability to make things happen in the world without continued education. This interpretation is clearly speculative, but may be worth pursuing in subsequent waves of analysis.

Table D. Summary of Connectedness Findings

	Comparison Group			NFTE		
	Pretest	Posttest	Change	Pretest	Posttest	Change
Hem Total	3.37	3.38	.01	3.55	3.46	-.09
Friends	3.71	3.68	.03	3.91	3.76	-.16
Parents	3.75	3.76	.01	3.95	3.87	-.08
Peers	3.30	3.23	-.07	3.36	3.24	-.12
School	3.44	3.37	-.07	3.54	3.39	-.15
Reading	2.80	2.87	.07	2.93	2.90	-.03
Siblings	3.40	3.53	.13	3.63	3.60	.03
Teacher	3.44	3.42	-.02	3.53	3.39	-.14
Neighborhood	2.48	2.54	.06	2.68	2.57	-.11
Self	3.86	3.83	.03	4.01	3.99	-.02
Future	3.73	3.68	-.05	3.96	3.90	-.06

FINDINGS FROM THE VALUES IN ACTION SCALES

The Values in Action (VIA) scales are designed by a group of leading researchers in the newly emerging field of positive psychology. This field is focused on studying the positive indicators of psychological growth and well-being. A core aspect of such growth is the ability to act on what one believes or values. Therefore, the VIA scales not only assesses beliefs and values; they also assess the extent to which students report acting on such beliefs and values. Prior research on the VIA scales suggests that students self reports are reliable indicators of actual behavior.

Because we believe NFTE addresses many of the positive values incorporated into the VIA assessments, and because it provides training for acting on such values, we selected targeted scales for use in this wave of our study. Specifically, we selected the four scales that seem most related to NFTE's purpose and teaching approach: *originality*, *curiosity*, *industriousness*, and *hopefulness*. The definitions of these scales are as follows:

- **Originality:** valuing creativity and novelty over certainty and security, both in values and in action.
- **Curiosity:** the degree to which students show interest in the world and in the way things work; high scorers on the curiosity scale also are likely to score high on originality.
- **Industriousness:** captures the value students place on hard work and productivity; high scores on this scale are those oriented toward “making things happen” or “getting things done.”
- **Hopefulness:** emphasizes an orientation toward optimism rather than pessimism, cynicism, or despair; students who feel optimistic about taking on new and exciting challenges would score high on hopefulness.

Each of these scales – individually and collectively – seem related to an entrepreneurial mindset. We hypothesized, therefore, that each would be affected by participation in NFTE.

Results from the VIA scales were similar in many respects to those of the Hemingway connectedness scales. As shown in Table E. below, NFTE students scored marginally higher than the Comparison group at Pretest, although this difference was not statistically significant. By posttest, however, the gap between the two groups was narrowed, with the Comparison students generally increasing somewhat, while the NFTE students generally declined. The industriousness subscale provided the only exception to this pattern. For this scale, NFTE students improved marginally, whereas the Comparison students declined by a small amount; the difference in change was not statistically significant.

What accounts for these negative findings? We do not have adequate evidence to explain the decline in NFTE scores, relative to the Comparison group. It is important to note, however, that the trend across the two groups (for both the Hemingway and the VIA) reflects the statistical phenomenon of “regression to the mean,” which argues that all things being equal differences at pretest will wash out at posttest, resulting in the two groups looking similar. This is precisely what occurred. The NFTE students remain slightly higher than the Comparison group at Posttest, but on average the NFTE students declined while the Comparison group students increased.

The concern, though, is that all things are not equal. The NFTE students received the intervention, whereas the Comparison group did not. Given this fact, the most likely interpretation of these findings is that the pressures against connectedness and positive development in the larger school environment are outweighing the strength of NFTE in certain respects. If indeed this is the case, the program needs to consider whether to address these factors explicitly in its programming. That is, should originality be highlighted and addressed through teaching strategies? The same question holds for each of the other factors. We will discuss this question in more depth in the implications section at the end of this report.

Table E. Summary of Findings for the Values in Action Scales

	Control			NFTE		
	Pretest	Posttest	Change	Pretest	Posttest	Change
VIA Total	67.84	68.16	.11	69.41	68.43	-.06
Originality	22.04	22.26	.25	22.17	21.76	-.09
Curiosity	15.88	15.59	-.02	16.26	15.85	-.20
Industriousness	11.31	11.25	-.07	11.38	11.53	.11
Hopefulness	16.17	16.60	.22	17.04	16.66	-.07

DISCUSSION AND IMPLICATIONS

In this closing section we review key findings from phase two of our study, compare those with findings from phase one, and finish with a discussion of lessons learned from our piloting of different assessment approaches over these two phases. As we wrap up analysis from phase two, we are simultaneously continuing the ongoing work of

our longitudinal study, and beginning plans for data collection for a new wave of schools beyond New England.

Review of Key Findings

Phase two of our study of NFTE's impact on the development of entrepreneurial attitudes and behavior yielded a number of important findings. First, the results from our newly developed Entrepreneurial Activities Checklist (EAC) showed that NFTE students were more likely than their Comparison Group peers to change in key areas over the course of the academic year. The NFTE students' overall Entrepreneurial Behavior score increased significantly from pre to posttest, while the Comparison Group scores remained static. This finding is especially important to our study, given the lack of instruments for assessing what might be deemed *precursors to adult entrepreneurship*. Because we are not only studying entrepreneurship per se – that is, the opening and developing of one's own business – but also the adolescent correlates of and precursors to later entrepreneurship, we were not certain that our instrument would detect differences between NFTE and Comparison Group students; nor were we certain that NFTE would produce the changes we were looking for. Therefore, powerful changes detected in the *Starter* and *Leader* subscales of our instrument are especially heartening. Increased scores in these areas for NFTE students (and not for Comparison Group students) suggest that the program is encouraging engagement in these arenas, and that our scales pick up this engagement.

Another important finding from the EAC is that change was found not only in the *business activity* subscale, but also in *sports and arts activity*. This finding suggests that NFTE students initiate and take leadership in sports and arts activities, as well as doing so in the business arena. This is important because the roots of entrepreneurship in adolescence likely have their moorings in areas rich with opportunities for initiation and leadership. Sports and the arts are two such areas. We anticipate that youth who initiate and take leadership in these arenas, are likely to take such actions forward in other areas as well.

Related to “taking initiative” is the popular notion of *locus of control*. People high on *internal* locus of control have been found to lead and take initiative, because they view

success as residing largely within themselves. On the contrary, people high on *external* locus of control view success as contingent upon a host of external factors, rather than attributing it primarily to their own efforts and capacities. Successful entrepreneurship has been associated with internal locus of control in other studies. Therefore, it is encouraging that NFTE students were found to increase their internal locus of control from pre to posttest substantially more than Comparison Group students. This was particularly the case for the immigrant participants in our study. In fact, immigrant students in the Comparison Group decreased markedly from pre to posttest on locus of control, becoming, by definition, more externally oriented.

Although we cannot explain why immigrant students in NFTE became more internally oriented while their Comparison Group peers did the reverse, we can speculate as to why this might be the case. Immigrant youth and their families generally have been found to be more entrepreneurial and idealistic about their future prospects than citizens who have lived in this country for multiple generations. However, the literature also shows that the children of immigrant families tend to decline in their idealism following years of assimilation to American norms. Our findings may help explain this phenomenon. That is, idealism that is met with barriers and obstacles is likely to turn to frustration and disappointment. If, on the other hand, immigrant idealism is met with real tools for engaging the opportunities available in our society, perhaps the sense of personal efficacy grows stronger. The fact that NFTE seems to provide particular benefits to immigrant youth (based on findings from both phases one and two) suggests that they view it as a tool for accessing opportunities. This, of course, is consistent with the initial premise and ongoing work of NFTE – that it can provide knowledge, skills, and tools to help underprivileged youth access the opportunities potentially available to them. Ongoing study is necessary to track the immigrant findings over time, but our results to this point suggest a good deal of promise in this area.

It also is important to note here that locus of control findings were strongest for students trained by NFTE's National Teacher of the Year. Students from this class increased dramatically in internal locus of control from pre to posttest. This finding reinforces a tenet that is critical to ongoing studies of NFTE: sampling must include top-notch NFTE teachers. In those cases where the programming is strongest, we are most likely

to detect results that can inform the field. Although it is useful to study processes and outcomes associated with a range of NFTE teaching, studies of best practice teaching are essential to the overall picture.

Another example of the importance of strong NFTE teaching came through in our finding that general *teacher connectedness* increased for students trained in NFTE by another teacher-of-the-year award winner. Students trained in NFTE by this teacher reported increases in the degree to which they feel connected to their teachers, while the Comparison Group students from the same school showed a strong decline in teacher connectedness. The *Hemingway Measure of Adolescent Connectedness* was used in our study precisely to explore this type of experience. We hypothesized that if students could feel more connected to school through NFTE they would ultimately form a stronger bond to school itself. Our evidence is not strong enough to support this hypothesis yet, but the teacher connectedness finding is a step in that direction.

Connecting Phase One and Two Findings

When examining significant findings across the last two phases of our study, an impressive picture begins to emerge. Phase one showed that NFTE students were more likely to increase in their occupational aspirations over the course of the school year; more specifically, relative to the Comparison Group students, NFTE students expressed increasingly strong interest in occupations requiring advanced training or formal education. In addition, the NFTE students were more likely than the Comparison Group students to express interests in college. Phase two findings show that NFTE students also are more likely than Comparison Group students to engage in a range of Entrepreneurial Behavior, such as taking initiative and leading in business, arts, and sports activities. When combining these findings, we see an emergent profile of NFTE students expanding their future occupational aspirations, taking initiative within their present circumstances, and taking on leadership roles in their lives. Although these findings need to be replicated through subsequent waves of study with larger samples of students before we can confidently stand behind them, the emerging picture is highly encouraging.

Assessment Lessons

Based on our analyses of the first two waves of data (2001-02 and 2002-03), we have learned important lessons for the measurement of NFTE's impact, at least in the time period immediately following completion of the program. It is possible and even likely, of course, that the most essential outcomes will not appear at posttest, but will, rather, show up further into the future. So instruments that did not show change at posttest are not necessarily ineffective for assessing NFTE; it is possible that their use over many measurement periods would yield important patterns of growth. Nonetheless, these first two phases of our study have shown that particular instruments are sensitive to detecting change immediately at posttest, and as such those instruments should receive strong consideration in future iterations of data collection.

In this 2002-03 phase of the study, we found that the *Entrepreneurial Activities Checklist* (EAC) proved enormously useful in detecting differences between NFTE and the Comparison students. Specifically, it showed that NFTE students changed significantly in the overall degree to which they engaged in a range of entrepreneurial behaviors, as defined by the instrument; the Comparison group students did not change significantly in this regard. Furthermore, the EAC was useful in picking up significant change in both starter- and leader-based activities, two important aspects of entrepreneurship. Although the EAC is still being refined it clearly shows strong potential for contributing to the standard package of assessment approaches.

The *Nowicki-Strickland Measure of Locus of Control* also yielded important findings that marked differences between the NFTE and Comparison groups. These differences were especially pronounced for immigrant participants, and for students in classes known for strong NFTE teaching. Given the importance of locus of control (feeling in control of one's fate versus feeling that one's fate is due to chance or external factors) in the adult entrepreneurship field, the strength of the Nowicki-Strickland in our study makes it an important tool for the subsequent steps.

We have had mixed results with the *Hemingway Measure of Adolescent Connectedness* over the past two years, however, each year one important finding has been uncovered by this instrument. For this second phase of analysis, an important School Site

by Teacher Connectedness interaction was found, whereby feelings of connections to one's teachers was dramatically increased for students who participated in NFTE with a recent NFTE New England Teacher of the Year award winner. This finding did not exist in the other NFTE schools, suggesting that when NFTE is taught particularly well, feelings of connection to one's teachers may be enhanced. This finding, of course, has strong implications for broader educational engagement and academic achievement.

In phase two, only the newly tried *Values in Action* (VIA) scales proved disappointing across the board. NFTE students did not show change on any of these scales. It is arguable that the scales assess deeper developmental and personality-related issues that take longer to change: originality, curiosity, industriousness, and hopefulness. Although these issues are important to entrepreneurship, we will need to give careful thought to whether we can further utilize them in our studies, given the constraints on time and student energy required to accurately complete the surveys.

In order to try out new instruments for phase two, we did not administer the ATOM (Across Time Orientation Measure), which focuses on students' self-perceptions across time, including present interests and future hopes and worries. The ATOM was critical to our phase one study, uncovering strong differences between NFTE and Comparison Group students in such areas as occupational aspirations, and ongoing educational interests. When examining outcomes from phases one and two together, it seems that an optimal assessment package would include the (1) ATOM, (2) Entrepreneurial Activities Checklist, (3) Nowicki-Strickland Measure of Locus of Control, and (4) the school and independent reading subscales of the Hemingway Measure of Adolescent Connectedness.

In the current academic year (2003-04) we are not collecting data on a new cohort of students; rather, we are collecting longitudinal follow-up data on students from phases one and two. This longitudinal data should allow us to further assess the impact of NFTE and the degree to which the various instruments are effective in picking up change. In addition to using each of the key instruments from phases one and two, we also added a new *Create a Resume* instrument, which will allow us to examine students' representations of their skills, accomplishments, and future career interests. The instrument will be scored in a manner that will help to determine the relative degree to which the students portray an entrepreneurial profile. This comprehensive assessment package should provide a fairly

thorough depiction of the degree to which NFTE is shaping entrepreneurial attitudes and behaviors.

Appendix A. Notes on Test Construction of the Entrepreneurial Activities Checklist

While the Entrepreneurial Activities Checklist is still under construction and refinement, exploratory statistics on the instrument's reliability (that is, how consistently students answered the questions) suggests that overall it is a highly reliable measure (Cronbach alpha=.89), and six of its subscales also fall between moderate and strong levels of reliability (See Table 1). This report includes only results from the subscales that are most reliable and relevant.

Table 1. Cronbach Alpha

	No. of Variables	Alpha
Total	49	0.89
Starter	19	0.75
Leader	13	0.75
Joiner	14	0.61
Business	9	0.60
General	5	0.70
Sports	4	0.75
Arts	11	0.80
Social	8	0.63