



WAMC Northeast Public Radio

ACCESS TO ADVANCEMENT:

An Audio Exploration of the National Effort to Increase the Role of Women with Disabilities in Science, Technology, Engineering and Mathematics (STEM)

Summative Evaluation Report: Survey and Case Study Results

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Kris Juffer, Ph.D., Evaluator

National Science Foundation
Research in Disabilities Education
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Action Research & Associates, Inc.
drkjuffer@actionresearchinc.com
PO Box 494 Ellicott City, MD 21041 410-465-1299



ACTION RESEARCH

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SUMMATIVE EVALUATION REPORT

Results of Outcomes and Impact Research

Evaluating the Impact of Two Radio Programs on
Women with Disabilities for
WAMC Northeast Radio's NSF-Funded Project HRD-0833247:

ACCESS TO ADVANCEMENT (A2A)

Executive Summary

Research Question 1: Did WAMC's *Access to Advancement* programs¹ impact their primary target audiences - Women With Disabilities (WWDs), educators, and parents?

Summary:

1A. A2A ACHIEVED ITS GOAL OF POSITIVELY IMPACTING ITS TARGET AUDIENCE

The majority of evidence indicates that *Access to Advancement* achieved its goals of positively impacting its primary target audiences' knowledge, and some attitudes and behaviors about STEM careers.

- The majority of evidence from both the pre- and post-survey results, as well as the case studies and focus groups, indicates that *Access to Advancement* programming achieved its goal of positively impacting its primary target audiences of women with disabilities (WWDs), parents and educators on multiple dimensions.
- Based on an analysis of the triangulated evidence from the three data sources in this study, women with disabilities, parents and educators become more knowledgeable and aware of opportunities for women with disabilities to enter the STEM field as a result of listening to WAMC's *Access to Advancement* programs. (Source: Table 2)

1B. LISTENING TO A2A CHANGED THE TARGET AUDIENCE'S KNOWLEDGE, ATTITUDES AND BEHAVIOR

¹ The two *Access to Advancement* (A2A) programs tested for this study were pilots developed by WAMC's *Access to Advancement* team to be embedded in one of two syndicated programs: *The Best of Our Knowledge* (TBOOK) -- a program focused on education-related issues, and 51% - focused on issues related to women. Triangulated data were gathered on the two pilot programs through focus groups, surveys and case studies to ensure reliable results and program development guidance. The A2A team used the resulting pilot program focus group recommendations to edit and re-record the first two programs, and to subsequently develop the other eight A2A programs -- for a total of ten programs --5 each for TBOOK and 51%. The resulting programs were not audience-tested due to funding limitations; therefore, the relative impact of the aired programs in achieving their goals with women with disabilities and other target audiences remains to be determined. A demographic description of the survey participants appears in Table 5.

- As a result of the respondents listening to the *Access to Advancement* programs, increases occurred in the sample's knowledge in multiple areas, as well as some of their attitudes and behaviors. (See Questions 2 and 3 for discussion of changes in their attitudes and behaviors below.)
 - The A2A radio programs significantly improved the WWD's knowledge about the availability of careers in STEM for women with disabilities. (Table 2)
 - The group mean scores measuring the WWDs' level of knowledge about the opportunities for WWDs in STEM careers changed from 1.9 to 3.2 immediately after listening to the A2A pilot programs. (Table 2)
 - This change in knowledge about STEM careers is statistically significant at the $p < 0.002$ level. (Table 2)
 - This result would indicate that Access to Advancement was instrumental in increasing women with disabilities' knowledge and awareness of opportunities in STEM careers at a statistically significant level. (Table 2)
 - Listening to the A2A programs tested, WWDs improved their knowledge about the availability and names of support programs. (Tables 6A/B)
 - The data also suggest that Access to Advancement serves as an effective source of encouragement for WWDs to begin to consider a career in STEM.
 - The encouragement the WWDs received from listening to the A2A programs appears to counteract the general discouragement from pursuing STEM careers many reported they had received from counselors, teachers, parents and others earlier in their lives. (Case Studies- Treatment Women, Post-Interviews, pp. 56-58).
 - Access to Advancement's tested programs generally presented some effective role models who were women with disabilities in the STEM field which stimulated the listeners to begin to consider STEM careers for themselves and other WWDs. There appeared to be exceptions to this finding, however. (Case Study, Treatment Women, Post-Interviews, p. 56-58)
 - Listening to A2A motivated some WWDs to take action to pursue further information about entering STEM careers. (Case Study, Treatment Women, Post-Interviews, p. 56-58)
- These results are important in light of the fact that *prior* to listening to *Access to Advancement*, most women with disabilities (WWDs) reported that:
 - They were not aware of career opportunities for women with disabilities in the STEM field;
 - They did not know, or know of, any role model WWDs who had pursued careers in the STEM field;
 - They could not name any support programs for Women with Disabilities to get into the STEM field;
 - They could not name any assistive technology for people with disabilities interested in STEM;

- Most of these college-educated WWDs reported that they had received **no encouragement** from parents, educators, counselors, peers, and other gatekeepers when they had showed interest in or inquired about education or career paths in the Science, Technology, Engineering or Math fields.
- Many of the college-educated WWDs who had expressed interest in a STEM career earlier in their lives reported they often faced **active discouragement** and redirection into other fields from significant people (teachers, counselors, parents, peers) in response to their expressed interest in STEM.

1C. MORE RESEARCH IS REQUIRED FOR A2A TO EFFECTIVELY AND CONSISTENTLY COMMUNICATE WITH WWDs

However, there is evidence that more work remains to be done for Access to Advancement to effectively understand, reach, communicate with and motivate Women with Disabilities about a number of important aspects.

- In particular, there are indicators that the pilot programs tested (see footnote 1) were somewhat mixed in their ability to “connect” consistently throughout the programs with WWDs, their interests, needs, and what motivates them. (Focus Groups, Surveys, Case Studies)
- Communications science has well established there are many opportunities for miscommunication between sender and receiver --- what a sender/person says and intends is different than what the receiver/listener hears, which is different from what s/he remembers, and ultimately different from what s/he understands. If the purpose of the A2A radio programs is to inform about STEM careers and support programs and motivate WWDs to enter the STEM field, those gaps in communication must be tightened and managed so that NSF's and the *Access to Advancement* program's goals are met with this grant.
- For example, counter-intuitively, WWDs were actually LESS LIKELY to report they would encourage *other WWDs* to enter into a STEM career, AFTER they had listened to the *Access to Advancement* stories (pre-survey mean group score=4.5 vs. post-mean score = 4.2.) (Table 4)
- A surprising, one-third of the WWD sample reported they would be LESS LIKELY to encourage other WWDs to enter the STEM field after they heard the A2A programs. (Table 4)
- Another example, A2A appears to have worked reasonably well for imparting factual knowledge about STEM careers and roles for Women with Disabilities. According to reports from the WWDs, this information had not been previously available -- or at least *salient* -- to the target audience. (Table 2)
- However, factual knowledge regarding *assistive technologies* available for WWDs did not show as much growth pre- to post-survey after listening to the pilot programs. This may be due, at least in part, to the fact that both programs tested focused on the WWD STEM training and support program, “Project DOIT” As a result, whether or not A2A effectively communicated with WWDs, parents and educators, and if not, how to effectively improve communicating regarding the important topic of assistive technologies, remain unknown.

- In another example -- there is evidence that one of the WWDs interviewed in the A2A programs, **Patricia, made a positive emotional connection and impact with the listeners.** Many of the positive comments made during the two focus groups specifically referenced the interview with Patricia. Plus, in the case study, Treatment WWDs remembered the interview with Patricia and still thought about her *six weeks after* hearing the A2A stories. (Case Studies- Treatment Women, Post-Interviews, pp. 56-58).
- However, some **other interviewee segments, in general, did not appear to connect as well with the WWDs as well as Patricia's story did.** This was reflected both in the focus group comments and case study interviews. Case Studies- Treatment Women, Post-Interviews, pp. 56-58).
- This may be due to any number of possible reasons - e.g. possibly, a lack of a "hook" relevant enough to catch the interest of the audience to effectively transition them into the interview; the need for a more effective "lead-in" to focus the listeners' attention; the need to fine-tune and focus the relevancy of the questions asked during the interview; the interviewer's or interviewees' energy levels; the length of the interaction; how the interview was used in the overall story; the number of interviews used, overall, in the story, etc.
- **Empirical research based on audience feedback could provide the kind of guidance to the A2A team that could strengthen and better focus the interview process.** Without that, one can only blindly guess as to how to effectively address this issue.
- After listening to the interviews with the women with disabilities in STEM in the two pilot-programs, **not all respondents expanded their definition of "knowing" (of) someone with disabilities who is in STEM, as reflected in their survey responses, to include someone they had heard about via A2A.** (Table 3)
- This seems to identify a communication barrier that the A2A programs have only partially overcome. This may be another indicator as to how much work these is to do with this population, to get them to identify with the WWDs they are hearing about in the A2A programs.

1D. A2A'S REMAINING COMMUNICATION ISSUES WITH WWDs APPEAR TO BE SUBSTANTIAL

The impact of these "misses," together with others described in this Summative Report, appears to be substantial.

- After listening to the two program pilots, the target audience of WWDs actually rated the Access to Advancement programs lower on some post-survey questions compared to the non-disabled respondents (parents, educators, and scientists.) (Table 1)
 - Regarding *The Best of Our Knowledge (TBOOK)*, WWDs rated the pilot program, on average, 3.4 on a 5-point scale, compared to a mean rating of the respondents without disabilities of 3.8. (Table 1)
 - Examining this statistic more closely, a full two-thirds of the WWDs rated TBOOK only "average" or "3." (Table 1)

- Turning to the A2A pilot of 51%, the entire non-disabled sample (100%) enthusiastically rated it a mean score of 5.0. (Table 1)
- In contrast, however, the WWD's rated it considerably lower, with a mean score of 4.0. About a quarter of the WWDs rated 51% a 3.0 or "average." (Table 1)
- Therefore, compared to the non-disabled sample studied, WWDs were considerably less likely to rate either A2A program as "Excellent." (Table 1)
- These results, in combination with others found in the report, would seem to indicate that *Access to Advancement* still has more work to do to understand their under-researched target audience, who have distinctive issues and sensitivities, in order to fine-tune the programs to effectively communicate with them, and to make these topics and issues more attractive to them.
- Compared to the non-disabled audience, the disabled audience appears to have had different standards when listening to the programs and was more critical of the A2A programming as tested.
 - It is important to note that subsequent to the A2A listening experience tested in this study, the A2A production team made a number of changes to the first two pilot programs, re-editing them - as well as the other eight programs that followed -- based on their understanding of the results from the initial process evaluation focus group feedback.
 - The degree to which these program revisions successfully met the primary needs and critiques from the target audience remains untested.
 - Another round of focus groups for the next stage of program development is recommended to ensure that the A2A programming has the basic information to optimize its programming to meet the particular needs and interests of the highly differentiated target demographic - Women (and people) with Disabilities, their parents, educators and counselors.
 - There remain many lessons still to be learned about how each show's topics, interviews, etc. can be made more deeply relevant and attractive to the target audience so that the programs go beyond being "average" to "excellent" for most target listeners.
 - Details about the type, directionality and strength of the knowledge, attitude and behavior changes are described below in the discussion of Results for Questions 2 and 3.

Research Question 2: Were there changes in the target audiences' learning, including changes in their:

- **Knowledge and awareness about studies and careers in STEM fields, WWDs in STEM.**
- **Knowledge of skills required for pursuing a STEM course of study or career**
- **Attitudes – from "I can't do that" to "I can do this!"**
- **Level of interest and motivation for WWDs to pursue studies/careers in STEM.**

Summary:

2A. KNOWLEDGE AND AWARENESS ABOUT STEM CAREERS FOR WWDs SIGNIFICANTLY IMPROVED

- Both the survey and case study results indicate that the *Access to Advancement* programs had a strong impact on the target audience's knowledge of STEM careers for Women with Disabilities.
- The group mean scores for the WWDs' level of knowledge about the opportunities for WWDs in STEM careers changed from 1.9 to 3.2 after listening to the A2A pilot programs. (Table 2)
- This change in knowledge is statistically significant at the $p < 0.002$ level, and indicates that *Access to Advancement* was instrumental in increasing Women with Disabilities' knowledge and awareness of opportunities in STEM careers. (Table 2)
- After listening to *Access to Advancement's* programs, parents', educators,' and scientists' mean score for knowledge about opportunities of Women in STEM also increased from 2.6 to 4.4 (pre- to post survey) on a 5 point scale, but the increase did not rise to the level of being statistically significant. (Table 2)

2B. PERSONAL KNOWLEDGE OR ACQUAINTANCE WITH OTHER WWDs PURSUING STEM CAREERS

- One measurement of a potential need for a radio program series such as *Access to Advancement*, or not, can be measured by how many alternative sources of information about STEM careers and role models a Women with Disabilities may have available to her in her life. This can be measured by the number of other Women with Disabilities she already knows, or knows of, as well as the number of WWDs parents, educators may be familiar with who have careers in STEM.
- If there are few or no role models in typical WWDs' friendship circles, this would indicate a significant gap. Therefore, to more effectively attract WWDs to enter the STEM field, sources need to be developed using other means for WWDs' to have role models and information about STEM Careers and support programs, such as that presented by a syndicated radio program on the topic. (Table 3)
- Based on data from the surveys and case studies, the *Access to Advancement radio programs* tested were effective introducing WWDs, parents, educators and scientists to role models who were WWDs in STEM careers.
- *Prior* to being exposed to the A2A radio programs, most of the Women with Disabilities did not personally know or were not familiar with any WWD who had entered a career in the STEM field. (Table 3)
- It can be inferred that they, therefore, lacked the images or awareness of successful WWD role models to emulate, inspire and guide them into the field.
- The WWDs' lack of awareness of women with disability role models in STEM may be due 1) a lack of WWDs role models common and visible in the young women's lives; 2) in part, to the reluctance of some people with "invisible" disabilities to self-identify, as well as to 3) other factors, such as the result of societal stereotypes and biases.

- The same lack of familiarity with WWD STEM role models is largely true for parents in the study. They also do not know of anyone with a disability who has had a successful career in STEM. This likely impacts the range of careers they can envision for their children, and the kind of support and guidance they provide women with disabilities *vis a vis* STEM careers. (Table 3)
- On the other hand, the educators and scientists, who mostly worked at universities or federal agencies, were more likely than WWDS or parents to personally know successful women with disabilities in the STEM field. (Table 3)
- However, interestingly, not all respondents expanded their definition of “knowing” someone, as reflected in their survey responses, to include someone they had heard about via the A2A radio programs. (Table 3)
- This seems to identify a communication barrier that the A2A programs have only partially overcome. This may be another indicator as to how much work these is to do with this population, to get them to identify with the WWDs they are hearing about - but not seeing - in the A2A programs.
- This may, also, be a function of some respondents deciding (and others not) to shift the traditional definition of “knowing” someone, to include “virtually knowing” someone via the electronic media. Or there may be inherent confusion about the intent of the question. Or there may be another cause for the lack of growth on this dimension after listening to two A2A programs.
- In future studies, this issue can be researched with respondents in an open-ended format, to better understand potential sources of ambiguity, if any, and to correct them to facilitate the programs’ ability to better “connect” on a deeper level with the target audience.

2C. KNOWLEDGE OF SUPPORT PROGRAMS FOR WWDs IN THE STEM FIELD

- When surveyed for the names of programs that support women with disabilities to go into the STEM field, *prior* to listening to the *Access to Advancement* radio program, **only one of the nine WWDs** and three of five of the non-disabled parents, educators and scientists **could name any programs**. (Appendix A, Table 6A)
- However, after listening to A2A programs, **8 of the 9 WWDs could name one or more STEM support programs for WWDs**.
- This suggests that the A2A programs tested were effective for most listeners in getting the basic names of programs across.

2D. KNOWLEDGE OF ASSISTIVE TECHNOLOGIES

- Most of the survey respondents did NOT know about specific assistive technologies for WWDs prior to listening to the *Access to Advancement* radio programs. (Table 3)
- *Prior* to listening to A2A, **6 of the 9 WWDs did not know of any assistive technologies** available for WWDs going into the STEM field. (Table 3)

- **After** listening to A2A, a surprising 5 of the 9 WWDs were *still* unsure of the names of the types of technical assistive devices. (Table 3)
- Therefore, the factor of factual knowledge regarding *assistive technologies* available for WWDs did not show as much growth pre- to post-survey after they listened to the pilot programs. This may be due, at least in part, to the fact that both programs tested focused on the WWD STEM training and support program, "Project Dolt." As a result, whether or not A2A effectively communicated with WWDs, parents and educators -- and if not, how to effectively improve communicating regarding the important topic of assistive technologies -- remains unknown.
- This would indicate that *Access to Advancement would* benefit from conducting more research to determine how to best to improve their programs to more effectively communicate with WWDs about other factual knowledge, such as the types of assistive technologies are available to help them succeed in the STEM field, as well as how to reach them at an deeper level to interest them and motive them into STEM.

2E. SOURCES OF ENCOURAGEMENT FOR WWDs TO GO INTO STEM CAREERS

- Most women with disabilities in the Treatment Group, as well as the Comparison Group, reported that they had not been encouraged, and some had been actively discouraged, from pursuing a career in the STEM field, or they were redirected into other non-STEM fields. The data suggests there is general a lack of encouragement for WWDs to pursue careers in STEM. (Focus Groups, Case Study, Treatment Women, Post-Interviews, p. 56-58)
- The dearth of systematic encouragement from traditional sources for WWDs to enter STEM careers means there is a gap and need for an outside source, like a broadcast media program, to fill the need.
- The case study data suggest that Access to Advancement serves as an effective source of encouragement for WWDs to consider entering the STEM field.

Post-A2A Interview with ES, Treatment WWD, 42 yrs, mobility disability:

ES stated the A2A radio programs were very encouraging.

Post-A2A Interview with SC, Treatment WWD, 59 yrs, mobility disability:

SC state that A2A has made an impact on her and she has thought about the possibility of pursuing a career in STEM. She remembers the stories about the women's accomplishments were very inspirational. They made her think in depth about her own life and she wondered if there was something she could do similar to some of their stories. She still has the two A2A radio programs on her mind.

Research Question 3: Did the audience participants demonstrate changes in their *Actions*, including changes in their:

- **Behavior demonstrating more interest in STEM and possibilities for WWDs.**
- **Decisions – re: studies, interests, careers in STEM.**

3A. LEVEL OF INTEREST IN AND/OR MOTIVATION TOWARD PURSUING STUDIES OR CAREERS IN STEM

- Research data indicate that WWDs found the *A2A* programs inspirational and encouraging.

3B. WWDs' SUBSEQUENT ACTIONS/DECISIONS INDICATE INCREASED INTEREST IN STEM

- All the Case Study Treatment Key Informants confirmed that the *Access to Advancement* programs were memorable and inspirational, and that they continued to think about what they had learned for the program, even 6 weeks later.
- They confirmed they had taken several actions based on what they had learned on the program.

3C. WOULD WWDs TAKE ACTION TO ENCOURAGE OTHER WWDs TO PURSUE A CAREER IN STEM?

- Counter-intuitively, WWDs were actually **LESS LIKELY** to report they would encourage *other WWDs to enter into a STEM career*, AFTER they had listened to the *Access to Advancement* stories (pre-survey mean group score=4.5 vs. post-mean score = 4.2.) (Table 4)
- One-third of the WWD sample reported they would be **LESS LIKELY** to encourage other WWDs to enter the STEM field after they heard the *A2A* programs. (Table 4)
- Interestingly, the *A2A* programs did **not** improve the *non-disabled's* likelihood to encourage *other WWDs* to enter the STEM field either! The non-disabled's likelihood to so **did not change** at all after listening to *A2A* (Pre-survey=4.6 vs. Post-survey=4.6, Table 4).
- Again, similar to some other factors, the WWDs reacted differently to the *Access to Advancement* programming than did the non-disabled. This raises important questions.
- To learn why this occurs, it is important to understand more deeply through research what it is that the WWDs are focusing on and reacting to when they hear the programming.
- Better understanding of the basic needs of this under-researched demographic group would be a prerequisite to WAMC's being able to develop consistently strong and positive *Access to Advancement* programming and outreach to WWDs that does not inadvertently dis-incent or discourage WWDs from pursuing desirable behaviors toward STEM careers.



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SUMMATIVE EVALUATION REPORT

Results of Outcomes and Impact Research

**Evaluating the Impact of Two Radio Programs on
Women with Disabilities for
WAMC Northeast Radio's NSF-Funded Project HRD-0833247:**

ACCESS TO ADVANCEMENT (A2A)

Report

Introduction

Action Research & Associates, Inc. was contracted by WAMC Northeast Public Radio to serve as the outside evaluator to evaluate WAMC's Information Dissemination project, ***Access to Advancement: An Audio Exploration of the National Effort to Increase the Role of Women with Disabilities in Science, Technology, Engineering and Mathematics (STEM)***, funded by the National Science Foundation's Division of Research on Disability Education, ***HRD-0833247***. Action Research applied to extensive experience in conducting rigorous program evaluation for the National Science Foundation and the federal government that meets the U.S. Department of Education's Scientifically-Based Research's (SBR) standards, as well as more the 25 years' expertise in assessing and improving the impact of media programs including radio and television for clients such as USDE, the Corporation for Public Broadcasting, Public Broadcasting Service, Voice of America Television and Radio stations, CBS Network, Arbitron Radio, etc. (See "***Background on Action Research & Associates, Inc.***" on page 61.)

To achieve that, Action Research designed and executed a multi-method quasi-experimental evaluation research design for the ***Access to Advancement (A2A)*** program, which was customized to meet the specific needs of a multi-media information dissemination program. The Evaluation Plan included three principle components:

1. *Access to Advancement* Program Logic Model
2. Formative Evaluation
3. Summative Evaluation

Brief Description of A2A Evaluation Components

A brief description of the three components is presented below:

Component 1: Developed an *A2A Program Logic Model* in conjunction with WAMC's A2A team to identify and analyze the program goals, outcomes and impacts desired, and how to develop a program to meet the goals, given the resources (inputs) available;

Component 2: Conducted a *formative evaluation* to audience-test two WAMC A2A segments for two syndicated radio programs: *To the Best of Our Knowledge (TBOOK)* and *51%*. The formative research's focus groups provided the program producers scientifically-gathered, empirical research data 1) to improve and enhance the programs' effectiveness before finalizing, recording, disseminating and broadcasting them; and 2) to provide the program producers a direct bridge and feedback loop to and from their target audiences to better understand and reach the widely diverse target audience segment with their specialized interests, attitudes and needs that often go unmet by other media and educational programming.²

Component 3: Conducted a *summative evaluation* to assess the A2A radio programs' outcomes and impact on target audiences via surveys and case studies.

The results of Components 1 and 2, the logic model and formative evaluation, were submitted by Action Research & Associates, Inc. as part of the 2009 WAMC Report to the National Science Foundation, Research in Disabilities Education Division for Grant HRD-0833247.

This report forms Component 3, the summative evaluation, of Action Research's program evaluation. The summative evaluation was designed to consist of two subcomponents: an outcomes study (pre- and post-survey results with samples from the target audience) and an impact study (case studies with Key Informant Treatment and Comparison Women with Disabilities). The purpose of the summative evaluation is to determine what intended or

² *In media research, in contrast to education research, formative research (focus groups) forms a fundamental component of an effective program development process. Focus Group feedback facilitates the production and dissemination of attractive, competitive media programming that effectively connects with, interests and meets the unmet informational and emotional needs of the target audience.*

Media program development and delivery is fundamentally different than education program development and delivery in many aspects. For example, when educators develop and deliver a program to students, they are constantly getting feedback real time from how students are reacting to the program while it is being delivered. The effective program developers/educators factor-in student feedback on a minute-to-minute basis, and fine-tune and adjust the program real-time as it is being delivered to meet students' needs and interests. This increases effective communication and multiplies the effectiveness of the program's impact and goal attainment.

In syndicated media programming, programs are finalized, recorded and then disseminated. The ONLY time the producers have an opportunity to fine-tune the program to meet target audience needs and interests is in the pre-production stage in focus groups. Therefore, focus groups are a critical component for producers to more deeply understand how best to communicate and motivate their audience, and for funding agencies to ensure the funding they provide produces the intended result through optimized programming.

unintended outcomes or impacts the programs may have had on Key Informants representative of the target audiences.

The three evaluation components are interrelated in that they empirically and iteratively build on each other in order to ultimately assist WAMC in their efforts to produce a stronger, better focused series of on-target radio programs to meaningfully address the issue of opportunities for Disabled Women in the STEM field.

Summative Evaluation: Surveys and Case Studies

As indicated above, to assess the impact and outcomes of the *Access to Advancement* program on its target audience, Action Research relied primarily on two types of studies - 1) **surveys** and 2) **case studies** with target audience samples. Results from the focus groups are also incorporated in the report where appropriate to provide fuller illumination.

Surveys: The pre- and post-surveys were administered before and after fourteen respondents (Demographic Description appears in Table 5, and pages 37-47) listened to two prototypes of the *Access to Advancement* programs on June 23 and 24, 2009 to assess what changes in the subjects' knowledge and attitudes may have occurred as a result of listening to the programs. The scope of the surveys assessed the listeners' rating of the two **A2A** programs tested, and changes in their **knowledge** of career opportunities and support programs and assistive technologies available for disabled women in STEM, as well as changes in their **attitudes** and **behaviors** regarding **STEM careers**.

Case Studies: The **case studies** employed a small-scale quasi-experimental design, with a Treatment Group of three key informants who were women with disabilities (WWDs) who listened to the **A2A** programs, and a Comparison Group of three WWDs who did not listen to the **A2A** programs, applying the same interview protocol and administration schedules for both groups. (Demographic Description appears in Tables 8-14, and pages 39-47) The pre-interviews for both the Treatment Comparison Groups occurred in June 2009 and the post-interviews for both groups were conducted in August 2009, approximately 5-6 weeks after the Treatment group had listened to the **A2A** programs.

* * * * *

To facilitate the usefulness of this report and the reader's quick comprehension, the Findings of the Outcomes and Impact Studies (the Summative Evaluation) will be presented together organized by key goal and evaluation questions below.

See **Appendix A** (p. 34) to review the methodology and sample description from the **Pre- and Post- Surveys** that were conducted before and after listening to the **A2A** programs.

See **Appendix B** (p. 39) to review the methodology, sample description, and pre- and post-interview summaries for the **Case Studies** for the Treatment Group, who listened to the **A2A** programs, and for the Comparison Group, who were not exposed to **A2A** programming.

Overall Audience Ratings of the Two A2A Pilot Programs Tested

After listening to prototypes of the two A2A programs tested, *51%* and *The Best of Our Knowledge*, the 14 survey participants, disabled and non-disabled, rated the pilots on a 5-point scale, 1 being "Poor" and 5 being "Excellent."

Table 1: How would you rate the *Access to Advancement* pilots you listened to?

Scale	Women With Disabilities				Respondents Without Disabilities			
	<i>The Best of Our Knowledge Pilot</i>		<i>51% Pilot</i>		<i>The Best of Our Knowledge Pilot</i>		<i>51% Pilot</i>	
	N	%	N	%	N	%	N	%
5=Excellent	1	11.1	2	22.2	1	20.0	5	100.0
4	2	22.2	5	55.6	2	40.0	0	0.0
3	6	66.7	2	22.2	2	40.0	0	0.0
2	0	0.0	0	0.0	0	0.0	0	0.0
1=Poor	0	00.0	0	0.0	0	0.0	0	0.0
Total	9	100.0	9	100.0	5	100.0	5	100.0
Group Mean Score	3.4		4.0		3.8		5.0	

Analysis and Discussion:

1. Surprisingly, the WWDs rated the *Access to Advancement* programs lower on post-survey questions compared to the non-disabled respondents (parents, educators, and scientists.) (See Table 1)
2. *The Best of Our Knowledge (TBOOK)*:
 - The non-disabled sample rated *TBOOK* a mean score of 3.8 on a 5 point scale.
 - However, the WWD's rated *TBOOK* a mean of 3.4. In fact, a full two-thirds of the WWDs rated it only "average" or "3."
3. *51%*:
 - The entire non-disabled sample (100%) enthusiastically rated 51% a mean score of 5.0.
 - In contrast, however, the WWD's rated it considerably lower than the non-disabled listeners, with a mean score of 4.0. About a quarter of the WWDs rated 51% a 3.0 or "average."

4. Summary:

- Compared to the non-disabled sample studied, the WWDs were considerably less likely to rate either A2A program as "Excellent." (See Table 1)
- Compared to the non-disabled audience, the disabled audience appears to have had different standards when listening to the programs and was more critical of the A2A programming as tested.
- It is important to note, subsequent to the listening experience and the sample's rating of the two shows, the A2A team made a number of changes to the first two programs and others that followed, based on the teams' understanding of the initial focus group feedback.
- The degree to which the program changes successfully met the primary needs and criticisms of the target audience is unknown. A set of formative focus groups was conducted, as funding allowed, to test the pilot program - which, in turn, generated the first set of program improvement recommendations.
- However, the WWDs' rating would seem to indicate that *Access to Advancement* still has more work to do to understand their under-researched and distinct target audience in order to further fine-tune the programs to effectively communicate with Women with Disabilities, and to make these topics and issues attractive to them.

Analysis by Key Research Questions

To focus the evaluation, Action Research & Associates, Inc. formulated three primary Key Research Questions based on NSF's Research in Disabilities Education's grant goals, and *Access to Advancement* program goals and Logic Model.

The Key Research Questions relative to the Summative Evaluation included:

- 1) Did WAMC's **Access to Advancement** programs impact their primary target audiences - Women With Disabilities (WWDs), educators, and parents?
- 2) Were there changes in the primary target audiences' **Learning**, including changes in their:
 - **Knowledge and Awareness** about studies, careers in STEM fields, WWDs in STEM.
 - **Knowledge** of skills required for pursuing a STEM course of study or career
 - **Attitudes** – from "I can't do that" to "I can do this!"
 - Level of **interest in and/or motivation** toward WWDs pursuing studies or careers in STEM.
- 3) Did the Participants/audiences demonstrate changes in their **Actions**, including changes in their:
 - **Behavior** demonstrating more interest in STEM and possibilities for WWDs.
 - **Decisions** – re: studies, interests, careers in STEM.

The Summative Evaluation focuses on evidence examining whether the *Access to Advancement* radio programs impacted the factors expressed in the Key Research questions. An **Analysis and Discussion of the Findings from the Results of the Surveys and Case Studies** related to the Key Research Questions follows below.

Research Question 1: Did WAMC's Access to Advancement programs impact their primary target audiences - Women With Disabilities (WWDs), educators, and parents?

Analysis and Discussion:

1A. A2A ACHIEVED ITS GOAL OF POSITIVELY IMPACTING ITS TARGET AUDIENCE

The majority of evidence from both the pre- and post-survey results, as well as the case studies and focus groups, indicates that *Access to Advancement* achieved its goal of positively impacting its primary target audiences of women with disabilities (WWDs), parents and educators.

- Based on an analysis of the triangulated evidence from the three data sources in the study, **women with disabilities, parents and educators became more knowledgeable and aware opportunities for women with disabilities to enter the STEM field as a result of listening to WAMC's Access to Advancement programs** (Source: Table 2)
- The majority of the evidence from both the pre- and post-survey results, as well as the case studies, indicates that *Access to Advancement* programming achieved its goal of **positively impacting its primary target audiences of women with disabilities, parents and educators to become more knowledgeable and aware of opportunities for women with disabilities to enter the STEM field.**

Post-A2A Interview with SC, Comparison WWD, 59 yrs., mobility disability:

SC remembered that the (A2A) stories of the women's accomplishments were very inspirational. They made her think in depth about her own life and she wondered if there was something she could do similar to some of their stories

- As a result of the respondents listening to the *Access to Advancement* programs, **increases occurred in the listeners' knowledge in multiple areas, as well as some of their attitudes and behaviors.** (See Research Questions 2 and 3 for discussion of changes in their attitudes and behaviors.)

For example, most Women with Disabilities reported that, *prior* to listening to *Access to Advancement*:

- They were **not aware of careers opportunities for women with disabilities in the STEM field**
- They did **not know, or know of, any role model WWDs who had pursued careers in the STEM field;**
- They could **not name any support programs for Women with Disabilities to get into the STEM field;**
- They could **not name any assistive technology for people with disabilities interested in STEM;**
- Most of these college-educated WWDs reported **receiving no encouragement -- and often faced active discouragement and redirection into other fields -- from parents, educators, counselors, peers, and other gatekeepers when they had showed interest in or inquired about education or career paths in the Science, Technology, Engineering or Math fields.**

1B. LISTENING TO A2A, CHANGED THE TARGET AUDIENCE'S KNOWLEDGE, ATTITUDES AND BEHAVIOR

As a result of the respondents listening to the *Access to Advancement* programs, **increases occurred in the sample's knowledge, as well as some of their attitudes and behaviors.**

- For example: the group mean scores for the WWDs' level of **knowledge about the opportunities for WWDs in STEM careers** changed from 1.9 to 3.2 after listening to the A2A pilot programs. **This change in knowledge is statistically significant at the $p < 0.002$**

level, and indicates that *Access to Advancement* was instrumental in increasing Women with Disabilities' knowledge and awareness of opportunities in STEM careers. (Table 2)

- Details about the type, directionality and strength of the changes are described below in detail in the discussion of Results for Questions 2 and 3.

1C: MORE RESEARCH IS REQUIRED FOR A2A TO EFFECTIVELY AND CONSISTENTLY COMMUNICATE WITH WWDs

Examining the full body of evaluation evidence demonstrates that more work remains to be done for *Access to Advancement* to effectively understand, reach and communicate with Women with Disabilities about STEM careers and opportunities.

In particular, there are indicators that the programs tested were somewhat mixed in their ability to “connect” consistently throughout the programs tested with WWDs, their interests, their needs, and what motivates them.

- *For example, A2A* appears to have worked relatively well, for imparting factual knowledge about STEM careers and roles for Women with Disabilities that had not been previously available or salient to the target audience.
- However, the factual knowledge regarding *assistive technologies* available for WWDs was not as well communicated, since some WWDs did not appear to pick up that information.
- Another example, there is evidence that one of the WWDs interviewed in the *A2A* programs, Patricia, made a positive emotional connection with the listeners. The case study Treatment WWDs remembered her 6 weeks after hearing the *A2A* stories.
- However, some other interviewee segments, in general, did not connect with the WWDs as well as Patricia's story did.
- This may be due to any number of possible reasons -- eg. a lack of a relevant “hook” to catch the interest of the audience transitioning them into the interview; the lead-in to focus the listeners' attention; the focus and relevancy of the questions asked to WWDs; the interviewer's or interviewees' energy level; length of the interaction; how the interview was used in the overall story, the number of interviews used overall in the story, etc. Empirical evidence based on audience feedback (focus groups) could provide the kind of guidance that could strengthen the interview process. Without that, one can only guess as to how best to address the issue.

1D: AZA'S REMAINING COMMUNICATION ISSUES WITH WWDs APPEAR TO BE SUBSTANTIAL

The impact of these “misses,” together with others described in the Summative Report appears to be substantial.

- After listening to the two program pilots, WWDs actually rated the Access to Advancement programs lower on post-survey questions than did the non-disabled respondents (parents, educators, and scientists.) (See Table 1)
- Compared to the non-disabled sample studied, the WWDs were considerably less likely to rate either AZA program as “Excellent.” (See Table 1)
- For *The Best of Our Knowledge (TBOOK)*, WWDs rated the program 3.4
- However, it is notable that a full two-thirds of the WWDs rated it only “average” or “3.” See Table 1)
- The entire non-disabled sample (100%) enthusiastically rated the 51% pilot a mean score of 5.0.
- In contrast, however, the WWD's rated it considerably lower, with a mean of 4.0. About a quarter of the WWDs rated 51% a 3.0 or “average.”
- These results would indicate that *Access to Advancement* still has more work to do to understand their under-researched target audience with distinctive issues and sensitivities in order to fine-tune the programs to effectively communicate, and to make these topics and issues attractive to them.
- Compared to the non-disabled audience, the disabled audience appears to have had different standards when listening to the programs and was more critical of the tested AZA programming.
- Importantly, subsequent to the AZA listening experience, the AZA production team made a number of changes to the first two programs and the other eight, based on the results from the initial focus group feedback.
- The degree to which these program revisions successfully met the primary needs and critiques from the target audience is untested
- A second round of audience research for the next round of program development is recommended to ensure that the AZA programming has the basic information to optimize its programming to meet the particular needs and interests of the highly differentiated target demographic - Women (and people) with Disabilities, their parents, educators and counselors.
- There remain many lessons to be learned about how each show's topics, interviews, etc. can be made more relevant and attractive to the target audience so that the programs go beyond being “average” to “excellent” for most target listeners.
- Details about the type, directionality and strength of the knowledge, attitude and behavior changes are described below in the discussion of Results for Questions 2 and 3.

Research Question 2: Were there changes in the primary target audiences' Learning, including changes in their:

- **Knowledge and Awareness** about studies, careers in STEM fields, WWDs in STEM.
- **Knowledge** of skills required for pursuing a STEM course of study or career
- **Attitudes** – from “I can’t do that” to “I can do this!”
- **Level of interest in and/or motivation** toward WWDs pursuing studies or careers in STEM.

Analysis and Discussion:

A number of factors were assessed to determine what changes, if any, occurred in the target audiences' knowledge, attitudes, interests, and behaviors, as a result of the *Access to Advancement* radio program.

2A. AWARENESS OF STEM CAREERS FOR WOMEN WITH DISABILITIES SIGNIFICANTLY IMPROVED

Evidence from Survey results:

RESPONDENTS WITH DISABILITIES:

Pre-Survey:

- The survey and case study data show that *prior* to listening to *Access to Advancement*, the Women with Disabilities were at best unsure (44%) about what the opportunities were in STEM careers for WWDs, or they did not know of any such opportunities in STEM for them (56%). (Table 2)
- Looking at those that did know about opportunities, they were only “Somewhat familiar” (44%) with the opportunities available, therefore indicating they were unsure about what the opportunities were in STEM careers for WWDs. (Table 2)

Post-Survey:

- After listening to the A2A programs, all the WWDs (100%) said that they were now “Somewhat” to “Very familiar” with STEM careers for women with disabilities, and no one still thought they were “Not at all” or “Just a little familiar” with the STEM career opportunities. (Table 2)

Gain:

- The Respondents with Disabilities Group's mean score changed from 1.9 to 3.2 after listening to the A2A programs, indicating that the A2A programs had a strong impact on the target audience's knowledge of STEM careers for WWDs. (Table 2)
- This change in knowledge is statistically significant at the $p < 0.002$ level, and indicates that *Access to Advancement* was instrumental in increasing Women with Disabilities' knowledge and awareness of opportunities in STEM careers. (Table 2)

RESPONDENTS WITHOUT DISABILITIES - PARENTS, EDUCATORS AND SCIENTISTS:

Pre-Survey:

- Examining what the Parents, Educators and Scientists without disabilities knew about opportunities in the STEM field, they were more likely than the WWDs to be familiar with the opportunities available for WWDs in STEM prior to listening to the A2A programs. This is likely due to the fact that many of the sample were educators and scientists who worked with WWDs in the STEM field daily and who were part of the *Access to Advancement* Advisory Board; therefore, they had a higher than expected knowledge level prior to listening to the programs. (Table 2)

Post-Survey:

- After hearing the A2A programs, most (60%) of the non-disabled respondents said that they were now “Very familiar” with STEM careers for women with disabilities, and no one still thought they were “Not at all” or “Just a little familiar” with the STEM career opportunities for WWDs. (Table 2)

Gain:

- The Respondents with Disabilities Group’s mean score changed from 2.6 to 4.4 after listening to the programs, indicating that the A2A programs had a strong impact on the parents’ and educators’ knowledge of STEM careers for WWDs.
- After listening to *Access to Advancement’s* programs, parents’, educators’, and scientists’ mean score for knowledge about opportunities of Women in STEM also increased from 2.6 to 4.4 (pre- to post survey) on a 5 point scale, but the increase did not rise to the level of being statistically significant for the Non-Disabled. (Table 2)

Table 2: How familiar are you about STEM careers for women with disabilities?

Scale	Women With Disabilities (N=9)					Respondents Without Disabilities (N=5)				
	Pre-Survey		Post-Survey		Change Pre-to Post-Survey	Pre-Survey		Post-Survey		Change Pre-to Post-Survey
	N	%	N	%	2-tailed t-test	N	%	N	%	2-tailed t-test
1=Not at all familiar	5	55.6	0	0.0		0	0.0	0	0.0	
2	0	0	0	0.0		1	20.0	0	0.0	
3=Somewhat familiar	4	44.4	7	77.8		2	40.0	1	20.0	
4	0	0	2	22.2		0	0.0	1	20.0	
5=Very familiar	0	0	0	0.0		2	40.0	3	60.0	
Total	9	100.0	9	100.0		5	100.0	5	100.0	
Group Mean Score	1.9		3.2		<i>P</i> <0.002 [^]	2.6		4.4		<i>P</i> <0.10

* change pre- to post-survey is statistically significant at the *p*<0.05 level

2B. WOMEN WITH DISABILITIES THAT THE RESPONDENTS KNOW (OF) WHO HAVE STEM CAREERS

Evidence from Surveys:

Pre-Survey:

- Most the college-educated WWDs in the studies did not know of anyone (55%) or only one person (22%) with disabilities who had entered the STEM field. (Table 3)
- This suggests that most did not previously have a role model or image of WWDs successfully entering the STEM field to inspire them into the field.
- The educators (60%) were more likely to know at least 1 person or more (up to 25 people) with disabilities who had gone into the STEM field. (Table 3)
- Parents were more likely (40%) than the educators and scientists, to not know anyone who had done so. (Table 3)

Post-Survey:

- On average, the WWDs and parents, non-disabled educators and scientists felt they had gotten to "know" an average of one more WWD who had entered the STEM field after they had listened to the A2A programs. (Table 3)

Gain:

- The group mean for both the WWDs, and the Parents/Educators and Scientists, changed from a Pre-Listening Mean of knowing 1 person with a disability (0.9) to knowing an average of 1.6 people. This would indicate that some of the respondents -- both WWDs and non-disabled -- expanded their definition of "acquaintances" to include the new WWDs they had just "met virtually" via the *Access to Advancement* radio program. (Table 3)
- However, not all respondents expanded their definition of "knowing" someone to include someone they had heard about via the A2A programs.
- This may be more of a function of some respondents deciding (and others not) to shift the traditional definition of "knowing" someone, to include "virtual knowing" someone via the electronic media.
- Or this may be linked to other evidence showing that the listeners received a vivid mental "image" of who "Patricia" who worked at Microsoft through the A2A interviews and stories. But the other interviewees were not as well developed and communicated. They seem to have missed their mark.

Post-A2A Interview with CB, Treatment WWD, 21 yrs., Learning Disability:

CB reported she found *some* of the stories very interesting -- especially the story about the woman who worked at Microsoft. She stated that the information she heard about the educational programs which encouraged and assisted women with disabilities left a lasting impression on her. She would like to see more information about the assistance programs offered and less interviews as there were a little too many in the longer piece.

- The issue about how to draw vivid lasting impressions for the WWDs through the on-air interviews can be explored with respondents in an open-ended research format to understand potential sources of ambiguity, if any, and correct them.

Table 3: How many women with disabilities (WWDs) do you personally know, or know of, who have gone into a STEM career?

N of WWDs in STEM Careers	Women With Disabilities (N=9)				Respondents Without Disabilities (N=5)			
	Pre-Survey		Post-Survey		Pre-Survey		Post-Survey	
	N	%	N	%	N	%	N	%
0	5	55.6	4	0.0	2	40.0	2	40.0
1	2	22.2	1	0.0	1	20.0	1	20.0
2	0	0.0	2	77.8	1	20.0	1	20.0
3	2	22.2	2	22.2	0	0.0	0	0.0
25	0	0.0	0	0.0	1	20.0	1	20.0
Total	9	100.0	9	100.0	5	100.0	5	100.0
Mean N of WWDs in STEM careers	0.9		1.6		0.9		1.6	

Evidence from Case study results:

Evidence from the Pre-Interviews:

- The trends of WWDs not knowing other WWDs who had entered the STEM field are replicated in the case study.³ (See Appendix B, pp 39-47.)
- In their pre-listening case study interviews, many of the college-educated women with disabilities in the Treatment Group, as well as the Comparison Group, reported that they did not know and were not familiar with other women with disabilities who had had successful STEM careers.

Pre-Listening to A2A Interview with BM, a Comparison WWD, 49 yrs., disability

BM said she did not have any female friends or friends with disabilities that had gone into any of the STEM fields.

2C. KNOWLEDGE OF SUPPORT PROGRAMS FOR WWDs IN THE STEM FIELD

Evidence from Surveys:

- When asked for the names of programs that support women with disabilities to go into the STEM field, prior to listening to the *Access to Advancement* radio program, only one of the nine WWDs and three of five of the non-disabled parents, educators and scientists could name any programs. (Appendix A, Table 6A)
- After listening to A2A programs, 8 of the 9 WWDs could name one or more STEM support programs for WWDs. (Appendix A, Table 6B)
- The 8 Treatment Women reported they had learned about different academic support programs such as “DOIT,” having heard of it from the A2A radio programs that were audience-tested. (Appendix A, Table 6B)

³ The question was not repeated in the case study post-interview.

- All (100%) non-disabled participants could subsequently name at least two or more programs for WWDs. (Appendix A, Table 6B)
- This suggests that the A2A programs tested were effective for most listeners in getting the names of programs across.

Evidence from Case Studies:

- In the case study pre-interviews conducted in early June 2009, all Treatment Group, as well as Comparison Group, women reported that they had not heard of and did not know of any specific program that encouraged or supported Women with Disabilities (WWDs) to get into Science, Engineering, Technology or Math (STEM) fields. This would provide additional support that few WWDs know of these programs. The question was not repeated in the post-interviews.

Pre-A2A Interview with Comparison WWD, 22 yrs old with a brain injury:

KK was not aware of any programs that encouraged or supported people with disabilities to go into STEM careers.

2D. KNOWLEDGE OF ASSISTIVE TECHNOLOGY FOR WWDs IN THE STEM FIELD

Evidence from Surveys:

- Most of the survey respondents did NOT know about specific assistive technologies for WWDs prior to listening to the *Access to Advancement* radio programs. (Appendix A, Table 7A)
- Prior to listening to A2A, 6 of the 9 WWDs surveyed did not know of any assistive technologies available for WWDs going into the STEM field.
- *Immediately after* listening to A2A, a surprising FIVE of the nine WWDs *still* were unsure of the names of the technical assistive devices. (Appendix A, Table 7B)
- This would indicate that *Access to Advancement* needs to do more research to determine how to better communicate with WWDs about the types of assistive technologies are out there to help them succeed in the STEM field, and how to access them.
- Or it may be a function of the type of program tested which focused on “Project DOIT” and its activities, and which only secondarily focused on assistive devices. At any rate, how to effectively communicate about the devices still remains to be determined.
- On the other hand, all the non-disabled participants in the surveys knew the names of assistive devices both before and after listening to the A2A programs. They stated that “there are many [assistive devices.] The problem is not with software, but access to it and knowing where and how to find it.” This could be a theme that A2A could expand on in the next year’s A2A programs.

2E. SOURCES OF ENCOURAGEMENT FOR WWDs TO GO INTO STEM CAREERS

Evidence from the Case Studies:

- Most women with disabilities in the Treatment Group, as well as the Comparison Group, reported that they had not been encouraged, and some had been actively discouraged, from pursuing a career in the STEM field, or they were redirected into other non-STEM fields.
- Only two women reported that parents who were scientists themselves or a science teacher had encouraged them to enter a STEM field, but rarely a school counselor.
- School counselors appear to be more often sources of discouragement re: STEM careers for most of these women.
- The data suggests there is general a lack of encouragement for WWDs to pursue careers in STEM.
- The dearth of systematic encouragement from traditional sources for WWDs to enter STEM careers means there is a gap or need for an outside source, like a broadcast media program to fill the need.

Pre-Interview with ES, a Treatment WWD, 42 yrs old with a mobility disability:

Earlier in her life, ES had considered and was encouraged by her school counselor and parents to study the social sciences or to become a counselor.

Pre-Listening to A2A Interview with SC, a Treatment WWD, 59 yrs., mobility disability

SC reported she was not encouraged by others to go into a STEM career, but pursued a related career (geographical information systems) out of her personal interest in science. She had been really interested in studying physics, but decided against it since she would have had to stay in school longer in order to get that degree. She had been discouraged from studying any of the STEM fields and even advised by her school counselor to go into other fields such as psychology or to be an adviser or counselor. She was told the STEM fields would be too tough for her and that she did not fit the mold for the prototypical scientist. SC stated that she does not remember any support being offered her for a career in the sciences. She was told by her parents, friends, teachers and counselors she would be better off doing something else. She did not know any female or disabled friends who have gone into the STEM fields.

Pre-Listening to A2A Interview with ES, a Treatment WWD, 42 yrs., mobility disability:

ES reports she received no encouragement to go into STEM field. She had been interested in computer science, but she was discouraged from pursuing a career in that field because when she grew up many people thought that was not a proper field for people with disabilities. Nor was she encouraged to enter technology, engineering or math. She believed this was due to the common misperception that people with disabilities do not go into the STEM fields.

Pre-Listening to A2A Interview with BM, a Comparison WWD, 49 yrs., disability

BM found her job at COARC, the largest provider of programs and services to individuals experiencing disabilities in Columbia County, New York, on her own, and reported she did not receive outside encouragement or support to get this job. She stated that she

had not considered pursuing a career in technology or engineering. She claimed that she had considered pursuing math because she likes numbers and science. She said that she did not have any female friends or friends with disabilities that had gone into any of the STEM fields. She stated that no one ever encouraged her to specifically go into any of the STEM fields. She said she received some support from her teachers as she looked towards going to trade school. Her teachers talked to her and gave her encouragement. She said, however, that there was not much support from the counselors.

Pre-Listening to A2A Interview with HM, a Comparison WWD, 24 yrs., learning disability

HM felt that she had been very fortunate since she had received encouragement from her teachers to pursue a career in science, particularly from her biology teachers. Her parents, who are biologists, were also key in her decision, since they helped her prepare for working in this field. HM stated that she received encouragement from teachers she had both in 8th grade and high school to pursue her interests in science. These teachers saw the skills she possessed and positively reinforced her skills as she matured. She claimed the support from counselors was generally positive as they recognized her interests in the science field. As far as her counselors were concerned, she claimed that they were supportive by pointing out her strong skills and achievements.

(ALSO, REFER TO 3A LEVEL OF INTEREST IN AND/OR MOTIVATION TOWARD PURSUING STUDENTS OR CAREERS IN STEM WHICH HAS SOME INDICATORS OF BEHAVIOR)



Question 3: Did the Participants/audiences demonstrate changes in their *Actions*, including changes in their:

- **Behavior** demonstrating more interest in STEM and possibilities for WWDs.
- **Decisions** – re: studies, interests, careers in STEM.

Analysis and Discussion:

3A. LEVEL OF INTEREST IN AND/OR MOTIVATION TOWARD PURSUING STUDIES OR CAREERS IN STEM

- Research data indicate that WWDs for the A2A Program inspirational and encouraging.

Evidence from the Case Studies:

Post-A2A Interview with CB, Treatment WWD, 21 yrs., Learning Disability:

CB reported she found *some* of the stories very interesting -- especially the story about the woman who worked at Microsoft. She stated that the information she heard about the educational programs which encouraged and assisted women with disabilities left a lasting impression on her. She would like to see more information about the assistance programs offered and less interviews as there were a little too many in the longer piece. She stated that she has thought about the radio programs since hearing them.

Post-A2A Interview with ES, Treatment WWD, 42 yrs., mobility disability:

ES stated that she had *thought frequently* about what she learned from the radio programs since she heard them over a month before. She said she had thought about both programs and all the things she learned, and had *talked to some other people* about it. On a whole, ES stated that the radio programs were very encouraging. It has *given her more information to pass on to other people with disabilities, especially younger ones, about STEM.* After listening to the *Access to Advancement* programs, ES found and read a magazine called *New Mobility* which is geared towards those people with disabilities, specifically in wheelchairs.

Post-A2A Interview with SC, Treatment WWD, 59 yrs., mobility disability:

SC stated that A2A has made an impact on her and has thought about the possibility of pursuing a career in STEM. She took the initiative to see a counselor at the Rockefeller University about this idea. She stated that she has a *strong desire to pursue a graduate degree and admits she has always had her heart in science.* She remembered the stories of the women's accomplishments were very *inspirational.* They made her *think in depth* about her own life and she wondered if there was something she could do similar to some of their stories. She indicates she still has the two A2A radio programs on her mind since hearing them and specifically wonders how they could be further developed in the future. She even *looked at the website, browsed through some of the information, and passed on what she has learned to others.*

3B. WWDs' SUBSEQUENT ACTIONS/DECISIONS INDICATE INCREASED INTEREST IN STEM

Evidence from the Case Studies:

- Of the three case study Treatment Key Informants, they all confirmed that the *Access to Advancement* programs were memorable and inspirational,

and that they continued to think about what they had learned for the program, even 6 weeks later.

- All three key information confirmed they had taken several actions based on what they had learned on the program:
- One went to visit a university counselor to look into possibility of pursuing a degree in an aspect of STEM.
- She had visited the WAMC *Access to Advancement* website and browsed through the STEM information.
- She had multiplied the programs' impact by passing on the STEM information to others.
- Another had found and read magazines supportive of her as a WWD. While apparently not a STEM magazine, the action may lead to renewed confidence in her abilities or future.
- She decided that she was not going to change careers, mid-career, into another STEM field, but she was already working in Math - in Accounting.
- Another key informant found that her earlier resolve to follow a Math field (Finance) had been strengthened by the program. She is looking to pursue and MBA in the field.

Post-AZA Interview with SC, Treatment WWD, 59 yrs., mobility disability:

SC stated that AZA has made an impact on her and has thought about the possibility of pursuing a career in STEM. She took the initiative to see a counselor at the Rockefeller University about this idea. She stated that she has a strong desire to pursue a graduate degree and admits she has always had her heart in science. She remembered the stories of the women's accomplishments were very inspirational. They made her think in depth about her own life and she wondered if there was something she could do similar to some of their stories. She indicates she still has the two AZA radio programs on her mind since hearing them and specifically wonders how they could be further developed in the future. She even looked at the website, browsed through some of the information, and passed on what she has learned to others

Post-AZA Interview with ES, Treatment WWD, 42 yrs., mobility disability:

ES stated that she had thought frequently about what she learned from the radio programs since she heard them over a month before. She said she had thought about both programs and all the things she learned, and had talked to some other people about it. She gave them some information about it and referred them to the website. Overall, she stated that she has a strong hope that the program will continue and grow in the number of episodes and in popularity. Since hearing the radio programs, she stated that she has not rethought the possibility of pursuing a career in a STEM field because she really likes what she does today (accounting). However, she did say that if she did have the ability to choose her career over again she might have made a different choice based on the knowledge she knows now from the AZA programs. She believes that STEM is a fast growing and lucrative field. She stated the levels of attractiveness of the careers of STEM by giving them all a 5's as being highly attractive. After listening to the *Access to Advancement* programs, ES found and read a magazine called *New Mobility* which is geared towards those people with disabilities, specifically in wheelchairs.

Post-AZA Interview with CB, Treatment WWD, 21 yrs., learning disability:

CB stated that she has had her mind set on a career in the math field for a long time now, and has been pursuing it in college.] But she found that the AZA radio programs were very useful since they did a lot to encourage her and support her decision.

3C: WOULD WWDs TAKE ACTION TO ENCOURAGE OTHER WWDs TO PURSUE A CAREER IN STEM?

Evidence from Survey results:

- Counter-intuitively, WWDs were actually **LESS LIKELY** to report they would encourage other WWDs to enter into a STEM career, **AFTER** they had listened to the **Access to Advancement** stories (pre-survey mean group score=4.5 vs. post-mean score = 4.2.) (Table 4)
- One-third of the WWD sample reported they would be **LESS LIKELY** to encourage other WWDs to enter the STEM field after they heard the **A2A** programs. (Table 4)
- In contrast, the mean group score for the non-disabled remained the same, after exposure to the (mean 4.6, both pre- and post-survey.) (Table 4)
- Interestingly, the **A2A** programs did not improve the non-disabled's likelihood to encourage WWDs to enter the STEM field.
- Again, similar to some other factors, the WWDs reacted differently to the **Access to Advancement** programming than did the non-disabled.
- To learn why this occurs, it is important to understand more deeply through audience research what it is that the WWDs are focusing on and reacting to when they hear the programming.
- Better understanding the basic needs of this under-researched groups would be a prerequisite to WAMC's being able to develop consistently strong and positive **Access to Advancement** programming and outreach to WWDs that does not inadvertently dis-incent or discourage WWDs from pursuing desirable behaviors.

Table 4: How likely is it that you would encourage a woman with a disability to go into a STEM career?

Scale	Women With Disabilities (N=9)				Respondents Without Disabilities (N=5)			
	Pre-Survey		Post-Survey		Pre-Survey		Post-Survey	
	N	%	N	%	N	%	N	%
1 = Not Likely	0	0.0	0	0.0	0	0.0	0	0.0
2	0	0.0	0	0.0	0	0.0	0	0.0
3	1	11.1	1	11.1	1	20.0	1	20.0
4	2	22.2	5	55.6	0	0.0	0	0.00
5 = Highly Likely	6	66.7	3	33.3	4	80.0	4	80.0
Total	9	100.0	9	100.0	5	100.0	5	100.0
Group Mean Score	4.5		4.2		4.6		4.6	



Appendix A

Access to Advancement Survey Study

Methodology

Survey Sample Development

Description of the Sample

Survey Results

Sample Tables

Results Tables



Appendix A

Access to Advancement Survey Study

Methodology

To scientifically examine what changes in knowledge, attitudes, and behaviors occurred as a result of being exposed to and listening to the NSF RDE-funded *Access To Advancement* radio programs produced by WAMC Northeast Public Radio, Action Research & Associates, Inc. administered two surveys on the same day to samples of women with disabilities, educators, parents, scientists and engineers and the general public. The pre-survey was administered immediately prior to the sample subjects listening to two radio programs, and the post-survey (with virtually identical items) was administered after they had listened to the programs.

In this report Action Research urges the reader to interpret the survey findings cautiously, given that the study is small-scale and the participants self-selected to participate in the study. The key value of the pre to post- survey analysis is to gain an insight into the *Access To Advancement* programs' impact on a subset of its listeners, by analyzing the results from the pre-survey and contrasting them to the post-survey to identify patterns of changes in knowledge, attitudes and behaviors..

Survey Sample Development

To recruit the survey participants, Action Research contacted 14 community and educational institutions with connections to women with disabilities (WWDs), as well as New York state and county organizations and agencies in the Albany area. The colleges, organizations and agencies provided excellent response, and enthusiastically agreed to facilitate Action Research's request to communicate with their membership. To protect the organizations' members' identities, Action Research requested that the agencies/organizations forward the research invitation (with an application) to their membership via their email listserve.

It is estimated that more than 600 people with disabilities (estimated 50% women) were contacted by their organizations 1-3 times in May and June 2009, and invited to participate in the research. The email recipients could volunteer to participate in the focus groups, surveys, and/or case studies. The sample, therefore, was self-selected.

Action Research worked closely with the WAMC *A2A* Project Manager who also used her community resources to recruit participants. The goal was to recruit representatives from the *A2A* Advisory Group, working scientists and engineers, women with disabilities (WWDs), parents, K-12 and college educators, counselors, members of the community and public of differing ages and both genders.

WAMC and Action Research staff received training by the Disability Business Technical Assistance Center (DBTAC) at Cornell University regarding issues of interest to women with disabilities, and how to sensitively recruit and accommodate the focus group participants. Action Research and WAMC A2A staff conferred with DBTAC Technical Assistants at various points of the sample development and research process. A Technical Assistant from DBTAC was present at the June 23, 2009 focus group to facilitate and provide necessary accommodations for women with disabilities.

The June 22-23, 2009 timeframe for the survey was identified because the WAMC radio program development process dictated that the two prototype programs would be ready for testing then, and those dates coincided with the WAMC A2A Advisory Committee Annual Meeting.

Unexpectedly, the late June 2009 timeframe did not prove to be optimal for recruiting large numbers of women with disabilities, parents, educators and counselors to attend focus groups or participate in research. Although a general response from the Albany-area disability community had been recruited for and expected to participate, what was found was that, surprisingly, those most likely to respond to the invitation to participate in the research were primarily those from Albany-area college campuses. Due to the funding and program production cycles, the June 22-23 focus group timeframe coincided with the region's schools' summer break, after the colleges, universities, and high schools had dismissed for the summer. According to university EEO, Disabilities, and related offices, stated that most students and faculty were out of town or otherwise not available to participate until they returned Fall 2009. As a result of analyzing the situation, improvising and taking many additional steps above and beyond the usual ones to overcome this unexpected difficulty, Action Research, with WAMC's valuable support, successfully recruited 15 participants representing every key demographic group to conduct the surveys. One participant did not complete the post-survey; therefore, the study sample totaled 14 respondents.

Description of the Sample

The sample for the 2009 A2A surveys consisted of 14 participants, selected for key demographic characteristics. The surveys and radio program listening experience were conducted at "The Linda", a small-venue concert hall owned by WAMC (separate from WAMC's broadcast facilities), in Albany, NY on June 22 and 23, 2009 and coincided with the focus groups conducted at that site.

Six of ten *Access to Advancement* Advisory Board Members participated in the Pre- and Post-Surveys while attending the Advisory Board's Annual Meeting at WAMC in Albany, NY on June 22, 2009. The Advisory Board was comprised of professional and practicing scientists and engineers, university educators, and the director of an assisted living facility from around the Nation. (Table 5)

Nine additional survey participants were recruited from the Albany-area community, and represented parents, educators, counselors, the public, and disability agency staff. Almost all survey respondents were college educated. The following summarizes the key demographics of the survey respondents. (Table 5)

Table 5: Demographic Characteristics of Survey Participants (N=14)

Survey Participants	N	%
Gender		
Female	10	71.4
Male	4	28.6
Race		
Caucasian	13	92.8
Black	1	7.2
Disabled		
Yes	9	64.3
No	5	35.7
Profession/Status*		
Student	3	21.4
Educator	2	14.3
K-12	1	7.1
Higher Ed.	1	7.1
Counselor	2	14.3
K-12	1	7.1
Higher Ed.	1	7.1
University Administrator/Employee	3	21.4
Parent of Disabled Child	1	7.1
Disability Service Provider	2	14.3
Scientist/Engineers	5	35.7
Access to Advancement Board Members	6	42.9

* Totals exceed 100% since an individual could fit multiple categories

Survey Results

Several Survey Table results are embedded in the text. Below are Tables that are referred to in the main Summative Evaluation Report.

Table 6A: What are the names of some programs that support women with disabilities to go into the STEM field? (Women With Disabilities N=9)

	Pre-Survey Comments	Post-Survey Comments
1	Don't know.	Don't know
2	Don't know.	DOIT
3	Not sure.	DOIT, GEMS
4	Don't know of any.	ACCESS STEM
5	Don't know of any.	DOIT
6	Don't know	DOIT, ACCESS
7	Don't know	DOIT - Project ACCESS
8	Don't know	DOIT
9	Entry Point (AAAS), NIH has some programs for medical fields.	Do-IT, Entry Point, American Chemistry Society

Table 6B: What are the names of some programs that support women with disabilities to go into the STEM field? (Respondents Without Disabilities N=5)

	Pre-Survey Comments	Post-Survey Comments
1	Don't know	DOIT, NE Association for Blind, Bellevue College disabilities services.
2	Don't know.	DOIT, ACCESS STEM
3	NSF program on disabilities	AAAS, NSF programs for disabilities
4	American Chemical Society, Chemists with Disabilities	DOIT, ACCESS STEM; AES
5	ACCESS - Achieving Competence in Careers in Engineering and Space Science ACCESS - AAA	ACCESS - Achieving Competence in Careers in Engineering and Space Science

Table 7A: What assistive technologies are available for women with disabilities who go into the STEM fields? (Women With Disabilities N=9)

	Pre-Survey Comments	Post-Survey Comments
1	Don't know.	Don't remember.
2	Don't know.	Don't know
3	Don't know.	Don't know
4	Don't know.	Computer-assisted technologies
5	Don't know.	software, tactile graphics
6	Don't know.	Adaptive input devices,
7	Don't know.	Regular devices to do college courses
8	JAWS, wordcue,	JAWS, screen enlargement
9	computers which can read aloud (Kurzweil, etc.) screen enlargement	Mechanical, visual, auditory computer, mostly available to all persons with disabilities.

Table 7B: What assistive technologies are available for women with disabilities who go into the STEM fields? (Respondents Without Disabilities N=5)

	Pre-Survey Comments	Post-Survey Comments
1	Lots - numerous relating to computers and technology.	There are many, the problem is not with software but with access to it and knowing where and how to find it.
2	There are a wide range of digital and assistive technologies to my knowledge.	Tactile graphics, AT computers
3	There are many including voice activated computer system, motorized wheel chair as well as personal assistant to assist activities of daily living.	There are numerous adaptive technologies that can be used to support people with disabilities.
4	Speech recognition software, physical aids	Tactile graphics; accro-productions
5	Computer software, Adaptive Devices TTY's, etc	Computer technology



ACTION RESEARCH

Appendix B:

Access to Advancement Case Studies

Background

Case Study Methodology

Summary of Findings Treatment and Comparison

Sample Development

Sample Description

Pre-Interview* Summaries

Conducted early June 2009

Treatment Group
Comparison Group

Post-Interview* Summaries

Conducted August 2009

Treatment Group
Comparison Group

* Note: On June 23-24, 2009, Treatment Case Study Participants listened to two *Access to Advancement* Prototype programs designed to be aired embedded in two syndicated shows, *51%* and *The Best of Our Knowledge (TBOOK)*. None of the Comparison Group Case Study Participants listened to the A2A programs.



Access to Advancement Case Studies

Background

To further examine in more depth what changes in knowledge, attitudes, and intended behaviors occurred as a result of being exposed to and listening to the NSF RDE-funded *Access To Advancement* radio programs, Action Research & Associates, Inc. conducted six case studies with two samples -- Treatment and Comparison samples of women with disabilities -- to see what similarities and differences there may be between the two groups.

Case study research can be useful to bring an understanding of a complex issue and it can add strength to what is already known through previous research. Case studies emphasize detailed contextual analysis of a limited number of people, events or conditions and their relationships.

Researchers have used the case study research method for many years across a variety of disciplines. Social scientists, in particular, have made wide use of this qualitative research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods.⁴ Researcher Robert K. Yin defines the case study research method as an “empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p. 23).

Although the case study method that involves the study of a small number of cases offer no grounds for establishing reliability or generality of findings, it can illuminate and give meaning and depth to quantitative results, if the the case study research method is carefully planned and crafted applying it to real-life situations, issues, and problems. Reports on case studies from many disciplines are widely available in the literature.

Case Study Methodology

To conduct the case study, Action Research & Associates, Inc. selected multiple real-life cases to examine in depth the impact that the **A2A** radio programs had on women with disabilities who listened to the programs. To verify whether or not the programs had any impact, a separate sample of women with disabilities who did NOT listen to the **A2A** programs were also selected for case study, in order to verify if the changes (if any) in the Treatment women were accidental or circumstantial, or caused by having listened to the **A2A** programs.

⁴ *The Case Study as a Research Method*, <http://www.ischool.utexas.edu/~ssoy/usesusers/1391d1b.htm>

Both the Treatment and Comparison subjects were interviewed by telephone in early June 2009 prior to the Treatment women having listened to the **A2A** programs on June 23, 2009. Both groups were interviewed again 6 weeks later, in August 2009. In the interviews, they were asked a series of quantitative questions, to gather demographic information, and educational and interest information. In-depth interviews were conducted to gain more background on the WWDs' educational attainment and aspirations, their support systems, career selection, their interests and attitudes towards having a career in the STEM field, knowledge of STEM education program supportive of women with disabilities, and any attitudinal and/or behavioral changes.

As is typical in case study research, when there are multiple cases, each case is treated as a single case. Each case's conclusions can then be used as exploratory and/or confirmatory information that contributes to the whole study, but each case remains a single case.

Action Research developed a pre and post-interview protocol to address the key issues of interest in the overall study. The interviewer/investigator was selected and trained to be effective in establishing rapport, recruiting and talking on the telephone with women with disabilities about their education and careers, to follow the protocol, understand the definitions of key terminology, and to record all the responses.

The Treatment sample of women with disabilities was developed by inviting three of those who planned to attend the June 23, 2009 **Access to Advancement** focus groups to also participate in a pre-interview in early June 2009, prior to attending the focus groups (where they listened to the radio programs). They were post-interviewed in early August 2009, more than a month after they had heard the radio programs.

The Comparison sample was developed by inviting three women with disabilities who had been recruited in the same manner as the Treatment WWDs, and who had self-identified as wanting to participate, but could not attend the **A2A** focus groups. They, too, were pre-interviewed in early June, and post-interviewed in early August, following the same protocol and interview schedule as the Treatment group. Their responses were written down by the interviewer/investigator and summaries of them appear in the Appendix of this report.

Summary of Findings

Treatment Group Case Study Participants

- Since being exposed to the **Access to Advancement** program approximately 6 weeks before the post interview, all Treatment participants independently confirmed that they have had the radio programs and their content on their mind.
- Both the Treatment and Comparison Group women reported they did not know about any specific programs for women with disabilities or assistive technologies for women, particularly for STEM careers.
- However, after the Treatment women listened to the **A2A** radio programs, they not only learned the names of such programs and technologies, but they had very positive feedback about the programs. They reported they learned about different academic support programs such as DOIT and also

about assistive technologies for the blind including software and tactile graphics which they didn't know about before.

- One Treatment informant stated that she had taken action and she had encouraged and talked to other younger women about STEM fields and referred them to the website of the program.
- Another older Treatment informant who had already established her career stated that she has passed the information she gained from the radio programs on to other younger women, hoping that they will look into STEM as a possible career choice.
- A younger Treatment WWD said that her mind had been previously set on a career in math, and she found the **AZA** programs to be very supportive and encouraging for her to persist in attaining an MBA in finance or in the international trade finance market.
- A new idea that impressed them as important was the idea of a mentor. Two of the women stated that they had an experience with a "mentor" while growing up (as they defined it), who were helpful and positive people who assisted them during the moments when they were struggling in particular areas of their life growing up. One did not have that experience, so that facet of the radio program really struck her as important and the benefits of having one. She stated that the process that some of these women went through in the radio programs wouldn't have been possible without one and wondered how she, herself could have been helped if she had one while growing up.
- Information about the specific programs that encourage and assist women with disabilities left a lasting impression on the listeners.
- They responded very positively to profile of the blind woman working at top software company in computers software.

Comparison Group Case Study

- The Comparison Group women reported they did not know about any specific programs for women with disabilities or assistive technologies for women, particularly for STEM careers, similar to the Treatment women before they listened to **AZA**.
- Since their pre-interview, all three women in the Comparison group confirmed they had not listened to or watched any programs about women with disabilities or their careers.
- Similar to their pre-interview, in the post-interview, all Comparison WWDs stated they were not aware of any programs that support women with disabilities getting into the STEM field.
- One WWD, however, did visit the disability services office at her school to find out what STEM programs they had to offer. She stated that she had rethought her career and feels that she might do well in the technology field.

- Another WWD reported in her post-interview that she is thinking about getting a job in the science field. She stated that she had been doing some research on the number of women in certain disciplines of science including comparing men vs. women.
- One Comparison WWD said in her pre-interview that she had already decided to prepare for a “new challenge” and is focused on her studies in biology. She wants to become a physical therapist or physician’s assistant. In her post-interview, she was continuing her studies.
- Since the women in the comparison group did not have the radio programs to listen to, they gained no additional insight about women with disabilities unless they sought it out on their own.
- The fact that one of the women all two of the three of the Comparison women had changed course, and had taken steps to look into STEM careers may indicate 1) a naturally occurring interest in STEM; or 2) a halo effect after having participated in the first evaluation research interview about their interest in STEM careers; 3) or a wish to please the researcher.

Case Studies: Description of Survey Sample

The following describes and contrasts the demographic data from the Treatment and Comparison samples of Women with Disabilities (WWDs) in the Case Study.

Age

The women in the Treatment group were on average older than the women in the Comparison group; the Treatment women averaged 40.6 years old compared with the Comparison group, who averaged 31.3 years. (See Table X) A majority of the Comparison group were in their 20s, while the majority of treatment women were over the age of 40. (Table 8)

Table 8: Age: Treatment vs. Comparison Group Women

Treatment Group			Comparison Group		
Age	N	%	Age	N	%
20-29	1	33.3	20-29	2	66.7
30-39	0	0.0	30-39	0	0.0
40-49	1	33.3	40-49	1	33.3
50-59	1	33.3	50-59	0	0.0
60+	0	0.0	60+	0	0.0
Total	3	100.0	Total	3	100.0
Group Mean Age	40.6		Group Mean Age	31.3	

Education

The Treatment group women were overall better educated than were the Comparison Women; 100% of the Treatment women had attained some college education or higher, with one subject attending graduate school; while in the comparison group only 67% had a college education or higher. (Table 9)

Table 9: Educational Level: Treatment vs. Comparison Women

<i>Treatment Group</i>			<i>Comparison Group</i>		
<i>Educational Level</i>	<i>N</i>	<i>%</i>	<i>Educational Level</i>	<i>N</i>	<i>%</i>
High School	0	0.0	High School	1	33.3
College Education	2	66.7	College Education	1	33.3
Graduate Education	1	33.3	Graduate Education	1	33.3
Total	3	100.0	Total	3	100.0
Group Mean Education	College		Group Mean Education	College	

Employment

Both treatment groups reflected a similar employment pattern, with 67% employed, and only 33% unemployed. (Table 10)

Table 10: Employment: Treatment vs. Comparison Women

<i>Treatment Group</i>			<i>Comparison Group</i>		
<i>Employment</i>	<i>N</i>	<i>%</i>	<i>Employment</i>	<i>N</i>	<i>%</i>
Yes	2	66.7	Yes	2	66.7
No	1	33.3	No	1	33.3
Total	3	100.0	Total	3	100.0
Group Mean Employment	Employed		Group Mean Employment	Employed	

Type of Disability

The two treatment groups varied in the types of disabilities reflected: The Treatment group had 67% with a mobility disability and 33% with a mental or learning disability. On the other hand, in the comparison group, 100% of the women had a mental or learning disabilities. (Table 11)

Table 11: Type of Disability: Treatment vs. Comparison Women

<i>Treatment Group</i>			<i>Comparison Group</i>		
<i>Type of Disability</i>	<i>N</i>	<i>%</i>	<i>Type of Disability</i>	<i>N</i>	<i>%</i>
Mobility	2	66.7	Mobility	0	0.0
Mental/Learning	1	33.3	Mental/Learning	3	100.0
Sensory	0	0.0	Sensory	0	0.0
Emotional	0	0.0	Emotional	0	0.0
Total	3	100.0	Total	3	100.0

Favorite School Subjects: Treatment vs. Comparison Women

When asked an open ended question - “What is your favorite subject in school?”, the treatment groups differed in its interests. All the Treatment group stated that math, science or related subjects like accounting and finance were their favorites. Two of the comparison group women liked science and math related subjects, and one preferred English and or Social Studies subjects instead. (Table 12)

Table 12: Favorite School Subject: Treatment vs. Comparison Women

<i>Treatment Group</i>			<i>Comparison Group</i>		
<i>Favorite Subject</i>	<i>N</i>	<i>%</i>	<i>Favorite Subject</i>	<i>N</i>	<i>%</i>
Math/Science	2	66.7	Math/Science	1	0.0
English/History	0	0.0	English/History	1	100.0
Finance/Accounting	1	33.3	Finance/Accounting	1	0.0
Total	3	100.0	Total	3	100.0

How Attractive are the STEM Fields?: Treatment vs. Comparison Women

The treatment groups were asked to rank how attractive each of the four STEM subjects were to them (Science, Technology, Engineering and Math) on a 1-5 scale with "1" being "Not at all attractive" and "5" being "Very Attractive." The mean scores for each subject averaged by all Treatment and Comparison women are reflected in Table X below. (Table 13)

The women in the Treatment group saw the four STEM fields - Science, Technology, Engineering and Math -- as very attractive with all fields averaging 4.25. Math and Engineering ranked highest at 4.6 and 4.3, respectively, while Technology and Science both averaged a 4 for these women. (Table 13)

In the Comparison group, they ranked all four STEM fields as 3.48, less favorably than the Treatment women. The Comparison women saw the fields of Math and Science as the most attractive with an average of 4.3 each. However, the field of Technology was seen as less attractive with an average ranking of 3, while Engineering was the least attractive with an average of 2.3. (Table 13)

In summary, the Treatment group overall saw all the STEM fields as more attractive in contrast to the Comparison group. (Table 13)

Table 13: How Attractive are the STEM field Subjects?: Treatment vs. Comparison Women

<i>Treatment Group</i>		<i>Comparison Group</i>	
<i>Attracted to STEM Subjects</i>	<i>Ranking 1-5</i>	<i>Attracted to STEM Subjects</i>	<i>Ranking 1-5</i>
Science	4	Science	4.3
Technology	4	Technology	3
Engineering	4.3	Engineering	2.3
Math	4.7	Math	4.3
Group Mean-STEM Attractiveness	4.25	Group Mean STEM Attractiveness	3.48

*Ranking: "1"= "Not at all attractive" and "5" = "Very Attractive"

Media Usage: Treatment vs. Comparison Women

When asked about their media usage during their first interview, the Comparison group was much more likely to use the TV, radio, and email virtually daily (6.67-7 days a week) and they turned to Social Networks and You Tube about 4 days a week. This pattern is in contrast to the Treatment group, which used almost all media -- and particular these media -- relatively less frequently (TV-3.6 days; radio-2.3 days; email-5.3days a week, Social Networking-2.3; You Tube-2.3.) This disparate pattern may be due to the relative youth of the Comparison Group, belonging to the “Digital Divide” demographic Group under age 30, compared to the Treatment Group who were 40 and older. (Table 14)

Whereas the Treatment group was less likely than the Comparison group to use media, they did rely on magazines four times more frequently than did the Comparison sample (one day weekly). (Table 14)

Both treatment groups, relied most strongly on the internet and email–5-7 days a week), with the comparison group slightly higher in both areas. (Table 14)

Of interest to this study, the radio was used more frequently by the Comparison group (7 days a week) in contrast to the treatment group at just over 2 days. (Table 14)

Table 14: How Often A Week Do You Use the Following Media? Treatment vs. Comparison Women

<i>Treatment Group</i>		<i>Comparison Group</i>	
<i>Media</i>	<i>Mean Days Used Media</i>	<i>Media</i>	<i>Mean Days Used Media</i>
TV	3.6	TV	6.67
Radio	2.3	Radio	6.67
Newspapers	1	Newspapers	2.67
Magazines	4	Magazines	1
Social Networks	2.6	Social Networks	4
You Tube	2.3	You Tube	4.33
Internet	6.67	Internet	7
Email	5.3	Email	7

*Ranking: “1”= “Not at all attractive” and “5” = “Very Attractive”



Pre-Interview Summaries

Treatment Group

Access to Advancement Case Study 1T-Pre Treatment Group Pre-Interview - early June 2009 CB: Albany, New York

CB, a 21 year old student at the University of Albany with a learning disability, is in school studying math with the intention of getting her MBA. Her career goal is to work in the international trade market. She was encouraged by her mother towards this field because she saw that her grades were always higher in math than in other subjects. She also had inspiration from her godmother who is in marketing and her god-sister who is currently in the international trade market. SC was not interested in technology or science and was she was not interested in engineering because she thought the work her father did on the car was engineering, which did not appeal to her.

CB does not have any female friends who have gone into any of the STEM fields, but she does have a blind friend who just graduated with a degree in computer science.

Her mother was the one who strongly encouraged SC towards studying math, having seen that SC excelled at the subject while growing up. SC was not aware of any support programs for people with disabilities and no one with disabilities who have had successful careers in the STEM field. Regarding how attractive of a STEM career would be, on a scale of 1 to 5, she ranked Math and Technology highest at "4" and ranked Science a "2."

CB is a moderate to heavy user of different types of media: She tuned into television 3 days a week, read newspapers 2 days and magazines 5 days a week, but did not tune into the radio at all during the week. She used social networking sites 7 days a week, You Tube or similar websites 6 days a week, internet at 7 days a week, email at 2 days a week. SC relies heavily on texting, doing so 7 days a week instead of emailing.

Prior to attending the WAMC focus groups, CB had not listened to the radio or WAMC Northeast Public Radio. She indicated she would listen to WAMC if there were features about women with disabilities because she is one and thought she could learn something new, as well as hear some success stories or helpful hints.

Career	Attractiveness on 1-5 scale
Science	2
Technology	3
Engineering	3
Math	4

Media	Days Per Week of Use
TV	3
Radio	0
Newspapers	2
Magazines	5
Social Networking	7
You Tube or similar	6
Internet	7
Email	2
Texting	7

**Access to Advancement Case Study-2T-Pre
Treatment Group
Pre-Interview - early June 2009
ES: Albany, New York**

ES is a 42 year old woman with a mobility disability who works in accounting as the Assistant Director of accounting at the University of Albany where she manages credit programs and travel. She reported she received no encouragement from parents, teachers or counselors to pursue the accounting career she is in today. They never even brought up a career in the sciences to her and were even having trouble with her wanting to be a business major.

Accounting was something she was always interested in from high school, and she chose and pursued the career herself. She considered and was encouraged by her school counselor and parents to study the social sciences or to become a counselor.

She reports she received no encouragement to go into STEM field. She had been interested in computer science, but she was discouraged from pursuing a career in that field because when she grew up many people thought that was not a proper field for people with disabilities.

Nor was she encouraged to enter technology, engineering or math. She believed this was due to the common misperception that people with disabilities do not go into the STEM fields. She did not know any female friends or friends with disabilities who went into any of the STEM fields. She was not aware of any specific programs designed for people with disabilities. She did know that the University of Albany offers a program that recruits people that are underrepresented in certain fields which includes minorities and people with disabilities.

In her opinion, having a career in a STEM field would be beneficial since it could improve a person's opportunity for advancement in society. Despite not knowing of any people with a career in a STEM field, she sees that people with disabilities have made progress in general as society has become more open-minded with the passage of the Americans with Disabilities Act. She is aware of some career success stories of people with disabilities.

ES finds all careers in the STEM field attractive, and she rates all 4 STEM fields a "5" out of a possible 5 points for being highly attractive career choices.

Media plays a role in her life on a weekly basis, but she picks and chooses which media she uses. She watches television daily, but only listens to the radio twice a week. She does spend a fair amount of time online on the internet and email almost daily. She does not use newspapers, magazines, social networking sites, or You Tube at all.

Since she does not listen to the radio at all, she does not listen to WAMC Northeast Public Radio. However, she would listen if there were features broadcast about women with disabilities so she could gain insight into some success stories.

Career	Attractiveness on 1-5 scale
Science	5
Technology	5
Engineering	5
Math	5

Media	Days Per Week of Use
TV	7
Radio	2
Newspapers	0
Magazines	0
Social Networking	0
You Tube or similar	0
Internet	6
Email	7

***Access to Advancement Case Study-3T-Pre
Treatment Group
Pre-Interview - early June 2009
SC: Avril Park, New York***

SC is a 59 year old woman with a mobility disability who is currently working as an intern in the GIS or geographic information field and who would like to continue working at this level in the state or federal sector.

SC was not encouraged by others to go into this career, but pursued it out of her personal interest in science. She had been really interested in studying physics, but decided against it since she would have had to stay in school longer in order to get that degree. She had been discouraged from studying any of the STEM fields and even advised to go into other fields such as psychology or to be an

adviser or counselor. She was told the STEM fields would be too tough for her and that she did not fit the mold for the prototypical scientist. SC stated that she does not remember any support being offered her for a career in the sciences. She was told she would be better off doing something else. She did not know any female or disabled friends who have gone into the STEM fields.

Careers in technology, engineering or math had not sparked her interest originally. Thinking about the fields now, she felt that having a career in science, engineering and math were very attractive which she rated a "5," and she ranked technology a "4" on a scale of 1 to 5.

SC was not aware of any programs that encourage or support people with disabilities to go into the STEM field and did not know anyone with a successful career in these fields. In her opinion, this information is not more available or abundant because the school resources and counselors focus more on those with learning disabilities than those with physical disabilities. It was her experience on campus that people with physical and mobility disabilities are not accommodated or taken into as strong consideration as those with learning disabilities. This makes campus life more difficult for those with mobility issues, hearing or vision impairment. She feels that universities and schools in general are not properly prepared or equipped for those with physical disabilities. She feels that the institutions do not seem aware of how they are failing to make reasonable and adequate accommodations around the campus for people with physical disabilities.

SC is a fairly heavy media user -- she tunes into television 4 days a week and radio 5 days a week. She reads magazines 7 days a week and newspapers once a week. She visits social networking sites and You Tube once a week, but is on the internet and email 7 days a week.

She is a frequent listener to WAMC Northeast Public Radio, tuning in about 5 times a week. She said she would be very interested in listening to features that included women with disabilities out of curiosity and to see if there was information about resources to use.

Career	Attractiveness on 1-5 scale
Science	5
Technology	4
Engineering	5
Math	5

Media	Days Per Week of Use
TV	4
Radio	5
Newspapers	1
Magazines	7
Social Networking	1
You Tube or similar	1
Internet	7
Email	7



Pre-Interview Summaries

Comparison Group

Access to Advancement Case Study -1C-Pre Comparison Group Pre-Interview - early June 2009 BM: Hudson, New York 12534

BM is a 49 year old woman with a disability who has been working as an assembly worker at COARC, the largest provider of programs and services to individuals experiencing disabilities in Columbia County, New York, for 27 years. She reported she found this job on her own, and did not receive outside encouragement or support to get this job.

She stated that she had not considered pursuing a career in technology or engineering. She claimed that she had considered pursuing math because she likes numbers and science. She said that she did not have any female friends or friends with disabilities that had gone into any of the STEM fields. She stated that no one ever encouraged her to specifically go into any of the STEM fields.

She said she received some support from her teachers as she looked towards going to trade school. Her teachers talked to her and gave her encouragement. She said, however, that there was not much support from the counselors. She stated that she is taking online classes to become a nurse, which involves science, because she wanted something different at this point of her life.

BM said that she did not know of any programs that encourage or support people with disabilities to go into the STEM fields; nor did she know of anyone with disabilities that has had a successful career in STEM. In ranking the attractiveness of the STEM careers from 1 to 5 she was most enthusiastic about math (5) and science (4); and less enthusiastic about technology (2) and engineering (1) (Tables below).

Overall, she is a heavy media user, tuning into TV and radio daily, and reading newspapers almost daily. She went online daily to use the internet and email, but never used social networking or You Tube or similar sites.

BM is an active listener to WAMC Northeast Public Radio tuning in 5 times a week. Regarding listening to WAMC, she said she would tune in more frequently if there were features about women with disabilities, because she would very much like to hear what they would report on this topic.

Career	Attractiveness on 1-5 scale
Science	4
Technology	2
Engineering	1
Math	5

Media	Days Per Week of Use
TV	7
Radio	7
Newspapers	6
Magazines	0
Social Networking	0

**Access to Advancement Case Study-2C-Pre
Comparison Group
Pre-Interview - early June 2009
KK: Bay Shore, New York**

KK, a 22 year old with a brain injury, is currently majoring in human biology because “she has a keen interest in the human species.” It is her hope to become either a nurse or a physicians’ assistant with a preference towards the latter. Her mother, who is a nurse, was a big influence on her career choice. She indicates she has no interest in a career in other STEM careers, such as engineering, technology, or math simply because she does not like them. She is not aware of any female friends nor any other friends who are disabled who went into the STEM fields, other than her mother.

Her mother strongly encouraged her to enter the human biology field, as well as her biology teachers who saw that she excelled in science and biology with good grades.

KK was not aware of any programs that encouraged or supported people with disabilities to go into STEM careers, but did remember one person with a disability who had had a successful career. This person was the doctor who took care of her when she was in the hospital after her brain injury. He had suffered a stroke that had disabled him mentally, but he was able to overcome the limitations that he suffered and continue on in his profession. This person was an inspiration for KK.

When evaluating the attractiveness of careers in the STEM field on a scale of 1 to 5, she rated both science and math a “4,” technology a “3” and engineering a “2.”

Regarding media usage, she viewed television 6 days a week, listened to radio 3 days, read newspapers 2 days and magazines 1 day a week. She visited social networking sites, You Tube, was on the internet and email daily.

KK reports that she has never listened to WAMC Northeast Public Radio because she had never heard of it. She indicated she would listen to the station if there were features about women with disabilities because it would be something she could relate to and even help form a support system for her.

Career	Attractiveness on 1-5 scale
Science	4
Technology	3
Engineering	2
Math	4

Media	Days Per Week of Use
TV	6
Radio	3
Newspapers	2
Magazines	1
Social Networking	7
You Tube or similar	7
Internet	7
Email	7

**Access to Advancement Case Study-3C-Pre
Comparison Group
Pre Interview - early June 2009
HM: Cohoes, New York**

HM is a 24 year old woman with a learning disability who works as an undergraduate admissions counselor. She plans to begin studies in science, because she wants to be a high school science teacher.

She was inspired to become a science teacher by her sister who is a teacher. She always thought that science was interesting. She had considered careers in technology, math or engineering as options. However, she admitted that her math skills were not good, which had deterred her. In terms of attractiveness of a STEM career on a scale of 1 to 5, she rated technology, engineering and math a "4" and science a "5."

She felt that she had been very fortunate since she had received encouragement from her teachers to pursue a career in science, particularly from her biology teachers. Her parents were also key in her decision, since they helped her prepare for working in this field. She received background training experience from them while growing up on their farm as a child. HM stated that she received encouragement from teachers she had both in 8th grade and high school to pursue her interests in science. These teachers saw the skills she possessed and positively reinforced her skills as she matured. They made it more engaging and were very personable with her in class. She claimed the support from counselors

was generally positive as they recognized her interests in the science field. As far as her counselors were concerned, she claimed that they were supportive by pointing out her strong skills and achievements.

Although she could not remember the specific name of the program, she was aware of a program that supports students with disabilities in any field of study. She did not know of any people with disabilities who went into STEM careers personally, but she stated that her undergraduate adviser knew of a dyslexic student who got her Ph.D. and went on to become a professor. She knows of three people who have gone in the STEM fields -- one is in a health profession, another in forensics, and another has earned their Ph.D. in science. The biggest problem she has had to overcome with her studies was spelling which she solved with the help of a proofreader.

Electronic media were important to her: She tunes into both television and radio daily (See table below). She visits social networking sites 5 days a week, You Tube or similar websites, 6 days a week, and surfs the internet and reads email daily. She reads print media less frequently - she reads magazines twice a week, and never reads newspapers.

As a radio listener, she listens to WAMC Northeast Public Radio. She stated she would tune in to catch the features on women with disabilities, if they were offered because she would love to hear the interesting stories.

Career	Attractiveness on 1-5 scale
Science	5
Technology	4
Engineering	4
Math	4

Media	Days Per Week of Use
TV	7
Radio	7
Newspapers	0
Magazines	2
Social Networking	5
You Tube or similar	6
Internet	7
Email	7



Post-Interview Summaries

Treatment Group

Access to Advancement Case Study-1T-Post Treatment Group

Post Listening to Access to Advancement Programs Interview - August 2009 CB: Albany, New York

CB reported that she had listened to the WAMC radio programs *51%* and *TBOOK* during the WAMC focus groups in June 2009. She reported she found some of the stories very interesting -- especially the story about the woman who worked at Microsoft. She stated that the information she heard about the educational programs which encourage and assist women with disabilities left a lasting impression on her.

In particular, she said she appreciated learning about what “mentors” are and that they are available. To her, she felt that it is always good to know that mentors are available and that there is someone to fall back on for assistance when needed. She claimed she had no prior knowledge of mentors and what they do.

She stated that she has thought about the radio programs since hearing them. For her, she said that the issues she had had in high school and early on in college could have been alleviated had she known and had access to some of the information she learned on the *AZA* programs, such as the availability of a mentor or assistance programs.

She stated that she was even ready to drop out her freshman year in college because she thought that she did not belong, but managed to fight through that urge and overcome those feelings. She knows that her struggle would have been less tough, and possibly alleviated if she had known about the support she could have access.

CB stated that she has had her mind set on a career in the math field for a long time now, and has been pursuing it in college. But she found that the *AZA* radio programs were very useful, since they did a lot to encourage her and support her decision. At this point she said she is studying for the GMAT. She wants to pursue her masters in finance and work in the international trade finance market.

In general, she stated that she enjoyed and thought the radio programs were really good. She would like to see more information about the assistance programs offered and less interviews as there were a little too many in the longer piece. For her, she said the experience of the focus group was very fun as well. She has not listened to WAMC or visited its website in since the focus groups.

Access to Advancement Case Study-2T-Post

Treatment Group

Post-Listening to Access to Advancement Programs Interview - August 2009
ES: Albany, New York

ES recalled the two *Access to Advancement* radio pilot programs she had listened to over a month prior to this post-interview, and had high praise for the programs and the people profiled. She specifically remembered the blind woman working for Microsoft. She recalled the positive feeling she had experienced learning of someone working at a top software company and succeeding with a disability. The other people profiled in the two programs she felt were also good choices.

Prior to listening to the *A2A* shows, she had been unfamiliar with the term “mentor” and what they could do for her personally, her education and career. However, after listening to the program, she realized she had had “someone like that in her life” who had helped her in school when she was growing up. ES talked about knowing about the issues and problems that a woman with a disability can go through and how a mentor can be that positive reinforcement to help push a person in the right direction. She had experienced before and was glad that it was talked about. She knows it is important and necessary for people with disabilities.

She stated that she had thought frequently about what she learned from the radio programs since she heard them over a month before. She said she had thought about both programs and all the things she learned, and had talked to some other people about it. She gave them some information about it and referred them to the website. Overall, she stated that she has a strong hope that the program will continue and grow in the number of episodes and in popularity.

Since hearing the radio programs, she stated that she has not rethought the possibility of pursuing a career in a STEM field because she really likes what she does today (accounting). However, she did say that if she did have the ability to choose her career over again she might have made a different choice based on the knowledge she knows now from the *A2A* programs. She believes that STEM is a fast growing and lucrative field. She stated the levels of attractiveness of the careers of STEM by giving them all a 5's as being highly attractive. She noted that science was very challenging; technology, constantly changing; and engineering, newly attractive.

On a whole, she stated that the radio programs were very encouraging. It has given her more information to pass on to other people with disabilities, especially younger ones, about STEM.

After listening to the *Access to Advancement* programs, ES found and read a magazine called *New Mobility* which is geared towards those people with disabilities, specifically in wheelchairs.

She also stated she enjoyed the focus group very much and thought it was run very well. It was the different age groups present that helped provide different perspectives, and allowed her to attain a lot of information. Her only wish was that there were more people present [in the audience.]. She said that she had not listened to WAMC or visited the website since the focus group, but did have plans to do so in the immediate future.

**Access to Advancement Case Study-3T-Post
Treatment Group**
Post-Listening to Access to Advancement Programs Interview - August 2009
SC: Averil Park, New York

SC recalled listening to the **AZA** pilot radio programs "51%" and "The Best of Our Knowledge". She stated that these shows have made an impact on her and has thought about the possibility of pursuing a career in STEM. She took the initiative to see a counselor at the Rockefeller University about this idea. She stated that she has a strong desire to pursue a graduate degree and admits she has always had her heart in science.

She remembered the stories of the women's accomplishments were very inspirational. They made her think in depth about her own life and she wondered if there was something she could do similar to some of their stories.

She stated that "mentoring" was something that had not struck her as that important before. However, after hearing the **AZA** radio programs, she realized the strong benefits of having a mentor. She stated that the educational and career process that these women went through would not have worked without a mentor. It made her wonder what could have been done to help her growing up if she had one.

She indicates she still has the two **AZA** radio programs on her mind since hearing them and specifically wonders how they could be further developed in the future. She even looked at the website, browsed through some of the information, and passed on what she has learned to others.



Post-Interview Summaries Comparison Group

Access to Advancement Case Study -1C-Post Comparison Group Post-Interview - August 2009 BM: Hudson, New York

Since the pre-interview, BM reported that she had not listened to any television, radio, internet or other programs about women with disabilities and their careers. She also said that she was not aware of any educational programs that support women with disabilities getting into careers in the STEM field.

On the other hand, BM reported she would still like to be a nurse and her online classes were going well. Her choice to be a nurse she claimed was because she wanted a change and a challenge in her life, and not due to any particular encouragement or support she received from outside sources.

She stated she had not listened to WAMC or been to its website since the pre-interview, and did not report having plans to do so.

Access to Advancement Case Study - 2C-Post Comparison Group Post Interview - August 2009 KK: Bay Shore, New York

Since the pre-interview more than a month ago, KK has not listened to any television, radio, internet or other programs about women with disabilities and their careers but did visit the disability services office to find out what they had to offer. Other than that office, she informed me that she was not aware of any other educational programs that support women with disabilities get into careers in the STEM field.

She stated that she still has her mind on studying biology and wants to either become a physical therapist or physician's assistant. At this point in school, she said that she is looking to acquire an internship either at a health clinic or hospital working in the ER or a brain injury unit.

KK stated that she had not listened to nor visited WAMC's website since the pre-interview, but intends to look at the website in the near future.

***Access to Advancement Case Study - 3C-Post
Comparison Group
Post-Interview - August 2009
HM: Cohoes, New York 12047***

HM stated that since the pre-interview she has been actively searching for a job. During her job search, she read about a job fair at the University of Albany for women with disabilities but did not decide to attend. As far as she knows, she is not aware of any educational programs that support women with disabilities getting careers in the STEM field.

At this point, she claims that her thoughts are really focused on getting a job in the science field. She has been browsing postings for jobs of interest such as ones from NIH. She also stated doing some research on the number of women in certain disciplines of science including comparing men vs. women including those just teaching biology. She is coming to the end of her degree and informed me that she's trying to decide if she wants to pursue a job with just her masters or go onto getting her doctorate.

She also stated that she has not listened to WAMC nor visited its website during the last two months, nor did she have plans to do so.



Appendix C:

Background on Action Research & Associates, Inc.

Action Research & Associates, Inc., established in 1999, is a research firm based in the Greater Washington DC/Baltimore metropolitan area, and serving the Nation and the World. The Principal Investigator for WAMC's Northeast Public Radio's *Access to Advancement: An Audio Exploration of the National Effort to Increase the Role of Women with Disabilities in Science, Technology, Engineering and Mathematics (STEM)* mixed-methods evaluation study is Dr. Kris Juffer, Executive Director of Action Research & Associates, Inc. Dr. Juffer is well-qualified to conduct the WAMC Summative Evaluation, since she has been a professional researcher and evaluator for more than 25 years meeting federal standards and specializing in evaluating federal and state STEM education programs.

Action Research & Associates, Inc., a small business, customizes each evaluation research project by building specialized teams ("Associates") of highly competent researchers from among the Nation's top researchers, to meet the parameters of each project. To accomplish the summative evaluation, Action Research assembled a special team: In addition to Dr. Juffer as the Principal Investigator, the team consisted of methodologists, psychometricians, statisticians, database experts, an expert in instrumentation, and science educators.

Additional experience relevant to the WAMC *Access to Advancement* Program -- Dr. Juffer is one of the few evaluators who has conducted evaluation research that the U.S. Department of Education has indicated meets the federal standards for "Scientifically Based Research-SBR." In addition, Action Research has conducted high caliber research and educational program evaluations for such clients as the National Science Foundation, the National Institutes of Health - Office of Science Education, U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS), U.S. Department of Education, the Public Broadcasting Service's (PBS) *Kids Ready To Learn* TV Programming (*Sesame Street*, *Between the Lions*,) the Department of Defense's Educational Outreach Programs, U.S. Information Agency, the Fulbright Program, the Voice of America radio and television programming, Arbitron (national radio station ratings), CBS network television and radio, ABC network television, Clear Channel radio corporation, WAMC Northeast Public Radio (NPR), and other media companies; Harford and Prince Georges (MD) County Public Schools, Harford and Garrett (MD) Colleges, the University System of Maryland's Chancellor's Office and other non-profit agencies, corporations, universities and school districts.

In addition, Action Research's staff includes experienced developers of tests and assessments for National Assessment of Educational Progress (NAEP) and the Armed Services Vocational Aptitude Battery (ASVAB) and the. Dr. Juffer has conducted psychometric research for the Iowa Testing Program, a subsidiary of American College Testing (ACT), developing reliable and validated assessment instruments and achievement tests. She has also researched cross-cultural adjustment and developed a highly reliable (.95), nationally-recognized psychological test, the *Culture Shock Adaptation Inventory* (CSAI ©1983) which is considered a break-through in its field. Her work is recognized and used in many countries around the world.

With masters and doctorate degrees in education, Dr. Juffer has worked in education for more than 25 years, as a classroom teacher, district administrator, curriculum developer and coordinator, university professor, federal government program officer and senior official, contractor and professional evaluator. She has also conducted educational research, and media and communications research for local, state, national and international clients, and is fluent in Spanish at the professional level.