The Incremental Effects of

Ethnically Matched Animated Agents in Restructuring the Irrational

Career Beliefs of African American Young Women

by

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ABSTRACT

Although women of color have increased their presence in the workplace, many obstacles restricting career opportunities still exist. It is important that mental health professionals contribute in providing interventions to increase career opportunities for women of color. The purpose of this research is to add to the repertoire of interventions by studying the irrational career beliefs of Black women. This research utilizes the *Believe It!* program, an online career development program that focuses on altering irrational/maladaptive career beliefs that can prevent young females from pursuing career opportunities. An early study of *Believe It!* found it to be effective for Caucasian females, however the effects for minority females were less clear. The current study re-examined the effectiveness of *Believe It!* for minorities by altering the appearance of the animated character within the program. It was hypothesized that young African American women interacting with African American animated agents would display greater rationality in terms of career beliefs compared to young African American women interacting with Caucasian animated agents. Forty-four African American girls between the ages of eleven to fifteen were pre-tested with a battery of assessment devices addressing the irrationality of the girls' career beliefs. The measures included the Career Myths Scale, the Career Beliefs Inventory, the Occupational Sex-role Questionnaire, and the *Believe It!* measure. Four to eight days later, participants engaged in the online *Believe It!* Program; they were randomly assigned to either a matched condition (viewing the program

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with an African American animated agent) or a mismatched condition (viewing the program with a Caucasian animated agent). After completion of the intervention, participants were post-tested with the same assessment battery. MANCOVA and ANCOVA analyses showed that participants in the matched condition consistently benefitted from the matched intervention. Implications for this research are discussed.

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of African American Young Women

Even though women have increased their presence in the historically male-dominated workplace, many obstacles restricting career opportunities for women still exist. For example, women are greatly outnumbered in science, technology, engineering, and mathematics (STEM) careers. The 2008 US Bureau of Labor Statistics showed that the number of men age sixteen and older in computer and mathematics fields was 2,765,000, while the number of women age sixteen and older in this same field was 911,000. The number of men age sixteen and older in architecture and engineering fields was 2,536,000 while the number of women was only 395,000. In addition, as STEM education levels increase, the percentage of women in these education levels declines. For instance, women earn nearly half of mathematics bachelor's degrees, but only 27% of doctoral degrees (http://www.socwomen.org/socactivism/stem_fact_sheet.pdf). The problem is especially salient for women of color who face both gender and race barriers.

There have been many efforts to increase the number of career opportunities for women in the United States. These include educational approaches to generate interest and improve career preparation, building endeavors for women in STEM by non-governmental organizations, and creating programs targeting girls and women from preschool to graduate school. It is

important that counselors also contribute in providing interventions to increase

career opportunities for women of color. The purpose of this research is to

determine if the effectiveness of a cognitive restructuring program delivered over

the internet can be improved by incorporating ethnically matched animated

agents.

Development of Career Stereotypes

Many theories have been developed to explain the career development

process. For example, Gottfredson's theory of circumscription and compromise

concentrates on how children and adolescents began to recognize the range of

occupational choices in their society. The theory suggests an interaction of

processes including cognitive growth, development of self, elimination of least

favored vocational alternatives (circumscription), and recognition of and

accommodation to external constraints on vocational choice (compromise)

(Brown & Lent, 2005). The social cognitive approach also suggests an interaction

between people, their behavior, and environments (gender, culture, barriers, and

supports). This theory acknowledges the many personal and environmental

influences of career development (Brown & Lent, 2005).

While looking at the career development of children and adolescents, it is

important to understand the stereotypical thinking patterns that influence their

career identity. Children began to stereotypically associate jobs with genders in

their early years. Similar to career development, career stereotypes concerning

appropriate vocations for men and women are formed at young ages. For

example, Termain, Schau, and Busch (1982) conducted a study asking children to respond to questions measuring job preferences and sex-typing attributions. The study found that between preschool age and elementary school age, the nature and degree of job sex-typing increased. While preschoolers did not sex-type their job attributions, elementary school children generally did. Similarly, the younger age groups did not prefer different occupational services as a means of gender stereotyping, while the older group did. The researchers suggested that sex-typing increases as knowledge about society's expectations about gender increases (Termain, Schau, & Busch, 1982).

In addition, Taber (1992) presented findings that stereotypes concerning genders and jobs occur before people enter secondary school and remain stable throughout high school years. These stereotypes contain ideas that the suitability of a job for men and women are based on their perceptions of the representation of the two sexes in the jobs. Taber's results showed that youth believed the following jobs were suitable for men: Pilots, motor mechanics, plumbers, electricians and computer engineers. Models of jobs seen as appropriate for women included: Secretaries, shop assistants, nurses, hairdressers and junior school teachers (while company executive secretaries, leading hair stylists, shop managers, hospital managers and junior school heads were seen as appropriate for men).

As sex-typing in occupations takes place during the path of career development, stereotypes of women in STEM fields become very prominent and

central to the development of identity for women (Phillips & Imhoff, 1997).

Although environmental, cultural and ethnic factors, as well as individual

differences, influence the degree of stereotypical thinking as a representation of

the identity of women, irrational beliefs still exist. These irrational beliefs include

thoughts women may hold about what they can and can not do within their

careers.

Cognitive Restructuring

Many researchers have thought of interventions to facilitate career

development because of many ideas surrounding the development of educational

and occupational aspirations. For example, interventions include counseling

women to restore options that society has taken away, using career theories to

guide practice, career education to expand options, and advocating for

organizational and structural change (Brown & Lent, 2005). The specific

technique discussed in this research is cognitive restructuring, which aims to

reduce career and gender stereotyping by changing irrational thinking patterns.

Cognitive therapy emphasizes education. Albert Ellis, an early proponent,

argues that negative human emotions stem from irrational beliefs and

interpretations about life situations. The therapeutic process focuses on identifying

and disputing acquired irrational beliefs. People learn how to replace ineffective

ways of thinking with effective rational thoughts; hence the name cognitive

restructuring (Corey, 2009).

Keller, Brigg, and Gysbers (1982) show the importance of cognitive restructuring of career beliefs by citing four propositions about human behavior based on the reciprocal interaction mode: 1) Career behaviors can be conceptualized as responses to cognitive representations of career environments. 2) These cognitive career representations are functionally related to and modifiable through applications of the laws of human learning and cognitive development. 3) Vocational cognitions, behaviors, and environments interact to influence behavior. 4) Career behavior changes are cognitively mediated. Therefore, career counseling interventions should be based on cognitive techniques (Keller, Biggs, & Gysbers, 1982).

Computer-Based Counseling and Cognitive Restructuring

The percentage of US households with a computer rose from 8.2% in 1984 to 61.8% in 2003. The percentage of US households with internet access rose from 18% in 1997 to 54.7% in 2003. In 2003, 76% of all children 3 to 17 years lived in a household with a computer, and 83 percent used a computer at school (U.S. Census Bureau, 2003). The percentage of US households with internet continued to rise to 61.7% in 2007 (U.S. Census Bureau, 2008). These statistics show the rise of computer and internet usage in the United States.

With the use of internet technology on the rise, the use of internet counseling interventions have also been on the rise. American Psychological Association's (1997) view of computer based counseling is as follows:

"Delivery of services by such media as telephone, teleconferencing and internet is a rapidly evolving area. This will be the subject of APA task forces and will be

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considered in future revision of the Ethics Code. Until such time as a more definitive judgment is available, the Ethics Committee recommends that psychologists follow Standard 1.04c, Boundaries of Competence, which indicates that 'In those emerging areas in which generally recognized standards for preparatory training do not yet exist, psychologists nevertheless take reasonable steps to ensure the competence of their work and to protect patients, clients, students, research participants, and others from harm.'"

American Counseling Association (2005) states:

"Counselors inform clients of the benefits and limitations of using information technology applications in the counseling process and in business/billing procedures. Such technologies include but are not limited to computer hardware and software, telephones, the World Wide Web, the Internet, online assessment instruments and other communication devices."

Taking these internet elements into account, studies have discovered the effects that computer-based cognitive restructuring programs have on individuals. For example, Horan (1996) conducted a study where 11th- and 12th-grade students with below-average self-esteem were randomly assigned to either the computer-based cognitive restructuring or a relaxation-training control condition. Tailoring the cognitive-restructuring intervention program to each individual's unique pattern of irrational thoughts had a beneficial impact on self-esteem.

In addition, the use of animated pedagogical agents (animated agents) has shown that the actual characters are beneficial in a variety of ways. The characters can (1) facilitate learning environments through face-to-face learning interactions, (2) demonstrate complex tasks, employ locomotion and gesture to focus students' attention on the most salient aspect of the task at hand, and convey emotional responses to the tutorial situation, (3) offer great promise for broadening the bandwidth of tutorial communication and increasing learning environments'

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ability to engage and motivate students, (4) offer enormous promise for interactive learning environments (Johnson, Rickel, & Lester, 2000).

Multicultural Issues

There have been discrepancies in delivering mental health services to minority groups. Researchers and practitioners have found deficiencies in delivering services to Asian Americans, African Americans, Native Americans and Latinos. Sue, Fujino, Hu, Takeuchi, & Zane (1991) state that multicultural issues can be found in areas such as psychological assessments, types of treatment, therapist preferences for client characteristics that place ethnic minorities at a disadvantage, underutilization of services on the part of some ethnic groups, high premature termination rates, and ineffectiveness of traditional mental health services for ethnic minority clients. Therefore, it is important to keep in mind the culture of the client and be responsive to the various multicultural needs.

One way for counselors to be responsive is to acknowledge client preferences. Clients may prefer working with someone who is similar to them in regards to physical and personality attributes. For example, Coleman, Warnpole, Casali's (1995) meta-analysis showed that although values and outcomes were important to people, ethnic minorities tended to prefer counselors who were ethnically similar over European American counselors. Another study conducted by Townes, Korell, and Cunningham (2009) discussed the years of research that have shown African American preference for counselors of the same ethnicity.

The researchers found that high cultural mistrust, high Afrocentric attitudes, and low assimilation attitudes were related to a stronger preference for an African American counselor.

Counselor preference may in turn be related to the effectiveness of counseling interventions and client outcomes. Hall, Guterman, Lee, & Little's, (2002) study looked at children and adolescents' counseling outcomes to determine if clients benefit from working with counselors with the same ethnic, gender, and language identities as themselves. They found that these factors were in fact related to treatment effectiveness. For ethnic, language, and gender matched pairs; treatment outcome was rated higher than for non-matched pairs. Overall matching increased psychological functioning and decreased treatment dropout rates.

Due to the research that shows the importance of counselor-client similarities, matching ethnicities should be a prime concern with both human counselors and animated agents. For example, Moreno and Flowerday (2005) conducted a study in which college students learned about science with a multimedia program. One group chose to learn with or without an animated agent that represented a male or female of five different ethnicities. Another group was assigned an animated agent. Two of the six hypotheses included (1) students who are asked to pick an animated agent representation would choose a representation that is perceived to be similar to themselves in gender and ethnicity and (2) students will learn more when they learn with an animated agent that is perceived

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to be similar to them. The researchers found that while African American, Hispanic, and Native American students were more likely to pick animated agents similar to themselves than Caucasian students, there was not a significant effect on students' learning outcomes. This is different from Baylor's (2005) findings, who investigated the impact of animated agent images on affective and motivational outcomes. Their results indicated that the ability to choose animated agents may be beneficial for African-American students, who tend to affiliate strongly with the character. The findings from the studies above suggest that (1) African Americans tend to prefer learning from those that are similar to them, and (2) it is important to carefully design the animated agent image in order to provide optimal affective interactions.

Research Question

This research focuses on the incremental effects of African American animated agents in changing the irrational career beliefs of African American young women. The research utilizes the *Believe It!* program, an online career development program offered within Arizona State University's Virtual Counseling Center. The program focuses on altering irrational/maladaptive career beliefs that can prevent young females from pursuing career opportunities, using ethnically diverse animated figures. An earlier version of *Believe It!* (Kovalsi & Horan, 1999) that used still figures was found to be effective for Caucasian females, however the effect for minority females was not clear. The authors noted that minority females were less computer literate, and concluded that this factor

needed better clarification and control. Additionally, since the models represented four different ethnic groups, the influence of specific matching of ethnicities was not tested. *Believe It!* now uses animated agents instead of still figures but has retained the sound (speech) files used in the first edition. The current study will examine the effectiveness of *Believe It!* for minorities by restructuring the appearance of the animated character within the program to exclusively African American or Caucasian and evaluating the impact of either on African American young women. It is hypothesized that young African American women interacting with African American animated agents will display greater rationality in their career beliefs compared to young African American women interacting with Caucasian animated agents.

Method

Participants

The participants were 44 African American girls between the ages of eleven to fifteen (mean age 13.02 years, standard deviation 1.50). Participants included students from a junior high school, members of a youth organization, and two Baptist churches in the metropolitan Phoenix area. All participants were third generation or beyond in the United States, with English as their first language. To disguise the hypothesis of this study, young women of all races in each setting were allowed to participate, however only African American participants were included in the data analysis. The total number of participants that began the program was forty-seven. Three participants were excluded from

the study (two did not complete the second part of the program; one had a high number of missing responses in the questionnaires).

Measures

Demographic Questionnaire. This questionnaire consisted of ten questions requesting basic demographic information such as ethnic/racial self identification, age, grade, gender, and primary language. Specific questions can be found in Appendix A.

Believe It! **Measure.** The *Believe it!* measure was constructed to measure irrational thoughts specific to the *Believe it!* Program's four modules: (1) Children should be dependent upon adults for their career choices; (2) There is only one vocation in the world that will lead to happiness; (3) Choosing a vocation involves making a final decision at specific points in time; and (4) Certain jobs are more appropriate for men while other jobs are more suited for women. One statement was assigned to each module, in which participants were asked to rate the statement as it applies to them on a 5 point Likert scale (strongly disagree to strongly agree). Responses were added together; and, higher scores indicated less irrational thinking. Pretest internal consistency for the *Believe It!* measure was .73.

Occupational Sex-Role Stereotyping Questionnaire. Occupational sex-role stereotyping (see Kovalski & Horan, 1999) was measured by asking the adolescent what she would like to be when she grows up. A second question inquires what she would like to be if she were a male. Scoring was done by two

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raters acting independently. Providing the exact answer for both questions received a score of 5; a response with multiple answers and at least one occupation in common received a score of 4, an answer with occupations in the same field for male female received a score of 3, a response with multiple answers and at least one occupation in the same field received a score of 2; and an answer with nothing in common received a score of 1. Rater scores were added to produce each participant's score. Interrater reliabilities (Pearson's r) were .98 at pretest and .99 at posttest.

Career Beliefs Inventory. The Career Beliefs Inventory was designed to assist individuals who were junior high-school age and older in identifying career beliefs that may influence their career goals. The norms for this test were computed for the population of interest, female junior high school students. Test-retest reliabilities showed ranges from .74 to .35 over a one month interval and .68 to .27 over a three month interval (Mental Measurements Yearbook, n.d.). Discriminate validity of the instrument is shown with the instrument's inverse relationship with career commitment scores (Krumboltz, 1991). 26 of the 96 CBI items were used in the current study. Pretest internal consistency on the attenuated items measured .43. The items were scored with a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Responses were added together; where higher scores on the CBI reflect increased irrational beliefs. Reverse-scoring of items was completed so that CBI scores reflected the same scale as the other measures in the study.

Career Myths Scale. The Career Myths Scale was meant to evaluate the degree that students concede to their irrational career beliefs. This inventory has four components: Test Myths, Self-Esteem Myths, Misconceptions of Exactitude, and Career Anxiety Myths. According to Stead and Watson (1991), the concurrent validity of the instrument is supported by its correlation with the Idea Inventory (Kassinove, Crisci & Tiegerman, 1977), a measure of general irrational beliefs. The original inventory consisted of 27 items; five items were used in this study. Internal consistency on these attenuated items of the Career Myths Scale measured .30 on the pretests. The items are scored with a 5-point Likert scale from 1 (strongly agree) to 5 (strongly disagree). Responses were added together; where high scores represent a lower degree of irrational beliefs while low scores illustrate the opposite.

Animated Agent Appearance Questionnaire. Another questionnaire was used to measure the participants' perceptions of the animated agents' ethnicities in order to clarify if the participants perceived the animated agents as either Black or Caucasian. The participants were asked (1) How would you classify this animated agent (Black, Caucasian/White, Asian/Pacific Islander, Latino/Hispanic, Multiracial, or Other) and (2) How does the animated agent compare to you (same ethnicity, different ethnicity)? This questionnaire was given to the participant after the intervention.

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Treatment/Cognitive Restructuring Program

In order to measure the effects of internet based cognitive restructuring and African American animated agents, this study used the cognitive restructuring program, *Believe It!,* from the original Kovalski and Horan study. The program consists of four modules, each relating to a specific irrational career belief, namely:

1. Children should be dependent upon adults for their career choices

2. There is only one vocation in the world that will lead to my happiness

3. Choosing a vocation involves making a final decision at specific points in time

4. Certain jobs are more appropriate for men while other jobs are more suited for women

Each module utilizes a female animated agent that makes a statement resembling an irrational career belief. The animated agent then asks the participant if she "ever feels this way," which the student can answer "never" (if answered, the adolescent will view a reward screen and confirming example of rational self-talk pop ups, followed by the next module) or "sometimes or "often" (if answered, the adolescent will view cognitive restructuring dialogues that aim to change the irrational beliefs and suggest rational perspectives). Answers to questions such as "Does this make sense?" will allow the participant to advance to the next module (Kovalski & Horan, 1999).

The study had two treatment conditions, matched and mismatched. The matched condition consisted of self-identified African American students watching the program with an African-American animated agent. The mismatched condition consisted of self-identified African American adolescents watching the program with a Caucasian animated agent. Images of the animated agents can be seen in Figures 1 and 2.

The animated agents were constructed using a company specializing in online technologies, Oddcast. The script used was identical to the script in the original *Believe It!* program, with minor modifications to the wording and phrases of the affirmations. Both the Caucasian animated agent and the African American animated agent utilized the same script. In addition, the voice and diction recorded for the program was the same human voice used in both treatment conditions.
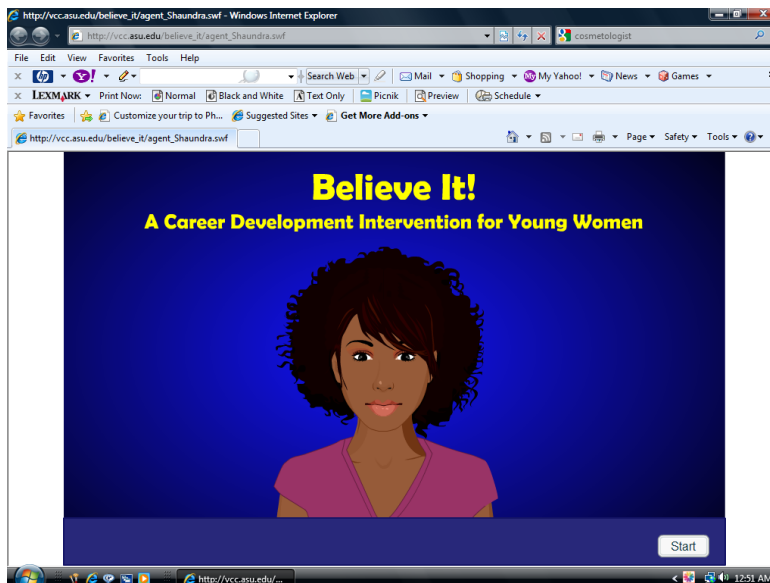

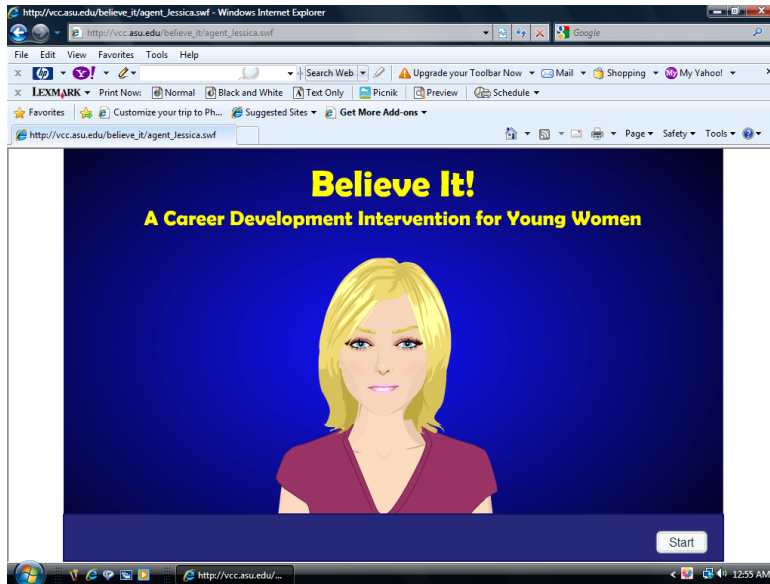Figure 1. *Believe It!* Program Matched Condition.

Figure 2. *Believe It!* Program Mismatched Condition.

Procedures

The study was conducted in two parts. Part one of the study began with participants being pre-tested with an online questionnaire, consisting of the demographic questionnaire, the Career Myths Scale, the Career Beliefs Inventory, the Occupational Sex-role Questionnaire, and the *Believe It!* measure. The students were allocated 20 minutes for the assessments. Part two of the study took place four to eight days later. At this time, participants engaged in a 15 minute online *Believe It!* program, although times to finish the programs varied among students. The adolescents from each setting were randomly assigned to one of the two conditions: a matched condition versus a mismatched condition. After completion of the intervention, participants were post-tested with a second questionnaire, consisting of the same above-mentioned measures. The pre-tests and post-tests were compared in order to analyze differences between matched conditions and mismatched conditions.

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Results

Equivalence for the matched and mismatched conditions was tested by a multivariate analysis of variance (MANOVA) on the pretest battery prior to treatment. There were no significant differences, Wilks' Lambda= .862, F (4, 39) = 1.56, p =.204, η^2 = .138, on the multivariate test. ANOVAs on all four pre-test measures were insignificant, as seen in Table 1. Although the two groups were arguably similar in irrational thinking at the start of the study, one of the follow-up ANOVAs approached significance (p=.07) and the pretreatment means were visually disparate. Treatment effects were thus tested using a multivariate analysis of covariance (MANCOVA) with pretests as covariates. The MANCOVA was statistically significant, Wilks' Lambda= .734, $F(4,35) = 3.17$, $p = .025$, $\eta^2 = .307$. Follow-up ANCOVAs, with pretest scores as general covariates, yielded significant treatment effects on the post test scores of three measures, with the fourth showing a p value of .058 (Table 1): Sex Role Stereotyping Questionnaire: $F(1,38) = 4.09$, $p = .050$, $\eta^2 = .097$; Career Belief Inventory: $F(1,38) = 9.66$, $p = .004$, $\eta^2 = .203$; Career Myths Scale: $F(1,38) = 6.75$, $p = .013$, $\eta^2 = .151$; *Believe It* Measure: $F(1,38) = 3.83$, $p = .058$, $\eta^2 = .092$.

The animated agent appearance questionnaire was used to determine whether the participants perceived the animated agents in the treatment condition as either Black or Caucasian. The consistency between the participants' condition and their perception of the condition was .98, with one participant in the mismatched condition marking that the Caucasian animated agent was similar in

appearance. These findings show that the animated agents accurately represented

the African American or Caucasian races.

The results show that the effects of African American animated agents on

African American young women are clearly beneficial in comparison to

Caucasian animated agents. Participants in the matched condition showed

decreased sex role stereotypes, increased rational career beliefs, and decreased

adherence to career myths.

Table 1
Means, Standard Deviations, ANOVAS, and ANCOVAs of Matched and Mismatched
Conditions on Testing Occasions

	Pretest			Posttest			
	Matched	Mismatched	ANOVA Pretest F (p)	Matched	Mismatched	ANCOVA Pre-Posttest F (p)	η^2
	M (SD)	M (SD)		M (SD)	M (SD)		
Believe It! Questionnaire	13.72 (2.85)	13.41 (3.84)	.098 (.756)	16.88 (1.89)	15.36 (2.26)	3.83 (.058)	.092
Sex Role Questionnaire	3.36 (2.68)	5.18 (3.72)	3.45 (.070)	6.09 (3.69)	5.59 (4.03)	4.09* (.05)	.097
Career Beliefs Inventory	92.37 (7.11)	92.50 (6.91)	.004 (.951)	104.90 (8.93)	96.99 (6.73)	9.66* (.004)	.203
Career Myths Scale	12.85 (2.10)	13.95 (2.80)	2.18 (.147)	16.72 (3.25)	15.36 (2.53)	6.75* (.013)	.151

*$p < .05$

Discussion

This research focused on the possibility of enhancing the effects of

internet based *Believe It!* program for altering irrational career beliefs that prevent

young females from pursuing desired career opportunities. The first edition of the

program used cartoon models representing four different ethnic groups, but did

not show an impact on minority females. The current study re-examined the effectiveness of *Believe It!* for African American girls by matching them with an African American animated character in the program.

Based on the literature review, it was hypothesized that African American females who engaged in the *Believe It!* program with an animated agent that appears to be African American would experience a significant reduction in irrational career beliefs as compared to those who engaged in the program with a Caucasian animated agent. A decrease in irrational thoughts was defined in four ways: reduction of irrational thoughts specifically related to the *Believe It!* Program; decreased sex-role stereotyping as seen by statements concerning jobs for men and women, a reduction in irrational career beliefs as seen with the Career Beliefs Inventory, and a decrease in the degree to which one concedes to their irrational career beliefs, as seen with the Career Myths Scale.

Assent and consent was requested from adolescents and their parents or legal caregivers. Forty-five girls between the ages of 11 and 15 participated in this study. Initially, the participants were asked to spend approximately 15 minutes completing the career belief assessments and questionnaires. The researchers returned approximately one week later and the participants were randomly assigned to view one of two versions of the online career program. The program consists of four modules, each relating to a specific irrational career belief. The participants then completed a second set of career belief assessments and questionnaires immediately after viewing the program.

Pretest equivalence for the matched and mismatched treatment conditions was tested by conducting a MANOVA and follow-up ANOVAs on the pretests. Treatment effects were analyzed using a MANCOVA and follow-up ANCOVAs on each of the four measures. Three of four measures were shown to have been significantly impacted, and the fourth marginally so. Matching animated agent ethnicity was effective for young, African American females in reducing occupational stereotyping, enhancing rational thinking, and decreasing adherence to career myths. An a priori power analysis indicated that 48 participants would be sufficient to detect large effects. Slight attrition reduced the sample size to 44, yet consistent effects were found regardless.

In sum, the use of African American animated agents was found to enhance the effects of the *Believe It!* program with African American young women. This result is not surprising, based on what previous research has shown. Studies such as Townes and colleagues (2009), Moreno and Flowerday (2005), and Baylor (2005) emphasize African American's preference for similarity, the effectiveness of counselor-client matching, and the need to look at these findings in future research.

Future research could show whether the phenomenon found in this study holds with other ethnic minorities. In addition, only skin tone was modified in the present study; the effects of other variables such as dialect or attractiveness remain unknown. It would be interesting to investigate in a subsequent study whether the effects can be further enhanced by providing an array of African

American animated agents that systemically vary on a number of dimensions and then letting the participants pick the animated agents they would like to interact with.

The implications of this study are important. The practical implication of this finding is to ensure that students are matched. The information provided here can provide a baseline for continuing to find methods to develop the *Believe It!* program and other career interventions to have an effect on African American adolescent females. Effective interventions may increase the number and range of career opportunities pursued by minority women within the United States.

References

American Counseling Association. (2005). *Code of Ethics.* Retrieved August 25, 2009 from http://www.counseling.org/Resources/CodeOfEthics/TP/Home/CT2.aspx.

American Psychological Association (1997). APA statement on services by telephone, teleconferencing, and Internet. Retrieved August 25, 2009 from http://www.apa.org/ethics/stmnt01.html

Baylor, A. L. (2005). The impact of pedagogical agent image on affective outcomes. Paper presented at the International Conference on Intelligent User Interfaces, San Diego, CA.

Browne, B. A. (1998). Gender Stereotypes in Advertising on Children's Television in the 1990s: A Cross-National Analysis. *Journal of Advertising, 27*, 83-96. Retrieved 6/1/2010 from http://www.jstor.org.ezproxy1.lib.asu.edu/stable/4189061?seq=5

Brown, S. D. & Lent, R. W. (2005). *Career Development and Counseling: Putting Theory and Research to Work.* New Jersey: John Wiley & Sons, Inc. Hoboken.

Career Beliefs Inventory (n.d.). In *The fifteenth mental measurements yearbook.* Retrieved September 3, 2009 from EBSCOHost Mental Measurements Yearbook database.

Coleman, H. L. K., Warnpold, B. E., & Casali, S. L. (1995). Ethnic minorities' ratings of ethnically similar and European American counselors: A meta-analysis. *Journal of Counseling Psychology, 42*(1)*,* 55-64

Corey, G. (2009) *Theory and Practice of Counseling and Psychotherapy 8th ed.* California: Thomson Higher Education.

De Wade, K. & Laursen, S. (2007) Women in Science, Technology, Engineering and Math (STEM). Retrieved September 3, 2009 from http://www.socwomen.org/socactivism/stem_fact_sheet.pdf

Greater Phoenix Economic Council (2003). Demographics and Trends in Greater Phoenix: 2010. Retrieved June 29, 2010 from http://www.gpec.org/Demographics_and_Trends.aspx

Hall, J., Guterman, D. K., Lee, H. B., & Little, S. G. (2002). Counselor-client matching on ethnicity, gender, and language: Implications for counseling school-aged children. North American Journal of Psychology, 4(3), 367-380.

Horan, J. J. (1996). Effects of computer-based cognitive restructuring on rationally mediated self-esteem. Journal of Counseling Psychology, 43(4), 371-375.

Johnson, W. L., Rickel, J. W., & Lester, J. C. (2000). Animated pedagogical agents: Face-to-face interaction in interactive learning environments. *International Journal of Artificial Intelligence in Education, 11*, 47-78.

Keller, K. E., Biggs, D. A., & Gysbers, N. C. (1982). Career counseling from a Cognitive perspective. The Personnel and Guidance Journal, 60(6), 367-371.

Kovalski, T. M., & Horan, J. J. (1999). The effects of internet-based cognitive restructuring on the irrational career beliefs of adolescent girls. Journal of cognitive psychotherapy: An international Quarterly, 13(2), 145-152.

Krumboltz, J. D. (1991). *Manual for the Career Beliefs Inventory.* Palo Alto, CA: Consulting Psychologists Press. C. W. (1990). '

Krumboltz, J. D. (1994). The career beliefs inventory. *Journal of Counseling and Development, 7,* 424-428.

Moreno, R., & Flowerday, T. (2005). Students' choice of animated pedagogical agents in science learning: A test of the similarity-attraction hypothesis on gender and ethnicity. Contemporary Educational Psychology, 31, 186-207.

Phillips, S. D., & Imhoff, A. R. (1997). Women and career development: A decade of research. Annual Review of Psychology, 48, 31-39.

Stead, G. B., Watson, M. B., & Foxcroft, C. D. (1993). The relation between career indecision and irrational beliefs among university students. *Journal of Vocational Behavior, 42,* 155-169.

Sue, S., Fujino, D., Hu, L., Takeuchi, D., & Zane, N. (1991). Community mental health services for ethnic minority groups: A test of the cultural responsiveness hypothesis. Journal of Clinical and Consulting Psychology, 59, 533-540.

Taber, K. S. (1992). Science-relatedness and gender-appropriateness of careers: Some pupil perceptions. Research in Science and Technological Education, 10, 105-115.

Termain, L. S., Schau, C. G., & Busch, J. W. (1982). Children's occupational sextyping. Sex Roles, 8, 691-710.

Townes, D. L., Chavez-Korell, S., & Cunningham, N. J. (2009). Reexamining the relationships between racial identity, cultural mistrust, help-seeking attitudes, and preference for a Black counselor. *Journal of Counseling Psychology,* 56. DOI: 10.1037/a0015449

U.S. Census Bureau (2003). Computers and internet use in the United States: 2003. Retrieved August 25, 2009 from http://www.census.gov/prod/2005pubs/p23-208.pdf

U.S. Census Bureau (2008). Household Internet Usage In and Outside of the Home by Selected Characteristics: 2007. Retrieved October 27, 2010 from http://www.census.gov/compendia/statab/2010/tables/10s1118.pdf

APPENDIX A

DEMOGRAPHIC QUESTIONNAIRE

Date of Birth:

Age (e.g., 6, 7, 8, etc)

School Grade (e.g., 6, 7, 8, etc.)

Self-Identification: (i.e., ethnicity/race)
    A. Euro-American/Caucasian
    B. Latino/Hispanic American
    C. African American/Black
    D. Native American
    E. Asian American (East Asian)
    F. Asian American (Middle East)
    G. Other: _____

Generation in the U.S.
    A. First (Born outside of the U.S.; you immigrated to the U.S.)
    B. Second (Your parents immigrated; you were born in the U.S.)
    C. Third (Your grandparents immigrated; you and your parents were born in the U.S.)
    D. Fourth (Great-grandparents immigrated; you, your parents, and grandparents were born in the U.S.)
    E. Fifth or beyond (Great grandparents, grandparents, parents, and you were all born in the U.S.)

Are you fluent (i.e., can have a complete conversation) in a language other than English?
    A. Yes
    B. No

What languages to you speak besides English? (Select all that apply)
    A. Spanish
    B. French
    C. Other: _____

Which language do you most commonly speak with friends?
    A. English
    B. Spanish
    C. French
    D. Other: _____

Which language do you most commonly speak with family?
    A. English
    B. Spanish
    C. French
    D. Other: _____

Which language do you prefer to speak overall?
    A. English
    B. Spanish
    C. French
    D. Other: _____

APPENDIX B

ASSESSMENT TOOL FOR *BELIEVE IT!*

Please select the number that best describes how you CURRENTLY feel about each statement.

1. The adults in my life can probably pick the best career for me.

Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
5	4	3	2	1

2. There's only one career choice in my life that will make me happy.

Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
5	4	3	2	1

3. I need to decide right now what career I want to have for the rest of my life.

Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
5	4	3	2	1

4. Math and science careers are for boys; I should pick something else.

Strongly Disagree	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
5	4	3	2	1

APPENDIX C

OCCUPATIONAL SEX-ROLE QUESTIONNAIRE

Please respond to the following questions by writing your answer in the blank space provided.

1. What would you like to be when you grow up?
    _____.

2. If you were a boy, what would you like to be when you grow up?

    _____.

APPENDIX D

CAREER BELIEFS INVENTORY

This inventory is designed to assess beliefs related to your career goals. Please read each statement and decide to what extent you agree or disagree with it. There are **NO** right or wrong responses. This Inventory will be most helpful to you if you answer honestly.

Indicate the response that best describes how you feel about each statement.

1	2	3	4	5
Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

_____ Once I make a career decision, I will stick to it.
_____ It's perfectly reasonable that, at this time in my life, I might not know what kind of work I want to do.
_____ I can start working at one kind of job and then change to some other work.
_____ If I were to train for one kind of work and later found that I didn't like it, I would still feel good about what I'd learned.
_____ I can't do the kind of work I want because I lack a required skill.
_____ Only I can say what work is best for me.
_____ Other people can prevent me from entering the kind of work I like.
_____ If I am unable to work in the occupation of my choice, I'm sure that I could find something else just as good.
_____ If the people who are important to me disapprove of the work I've chosen, it would not matter to me.
_____ If I don't find the best career for me, I'll be terribly upset.
_____ I want the people who are important to me to approve of the kind of work I do.
_____ When my career goal is unclear, I still continue working to the best of my ability anyway.
_____ College students should major in the subject they find most interesting even if they don't get their best grades.
_____ It doesn't matter if I make a poor career choice now because I can always make a change later.
_____ No one can stop me from doing the kind of work I want to do.
_____ No matter what past experience I've had, I would be willing to change to some other kind of work.
_____ At this time in my life I should know what kind of work I want to do.
_____ I can succeed in whatever occupation I like.

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_____ I don't have what it takes to be successful in the kind of work I like.

_____ I could be happy working at any one of a number of different jobs.

_____ Everything depends on my making the right career choice now.

_____ I want someone to tell me what work is best for me.

_____ If one career choice does not work out well, it won't bother me because I'll just try something else.

_____ Other people could persuade me to change my career direction.

_____ I am undecided about the kind of work I want to do.

_____ I'll never get into the work I'd like because of the type of person I am.

CAREER MYTHS SCALE

Indicate the response that best describes how you feel about each statement.

1	2	3	4	5
Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree

_____ It is a sign of weakness if I am career uncertain.

_____ The career I choose should satisfy significant others.

_____ The right career choice will lead to my success in that career.

_____ The selection of the right career will lead to happiness.

_____ It is essential to make the right career choice as I will remain in the career for life.

CHARACTER QUESTIONNAIRE

Please answer the following questions:

How would you classify the ethnic/racial appearance of the character in the computer program?

_____ Latino/Hispanic American
_____ African American/Black
_____ Asian American (East Asian):
_____ Asian American (Middle East)
_____ Euro-American/Caucasian
_____ Native American
_____ Other *(Please specify)*:_____

How does the character's racial/ethnic appearance compare to your own?
_____ Same ethnicity

_____ Different ethnicity