The Incremental Effects of Ethnically Matched Animated Agents in

Restructuring the Irrational Career Beliefs of Rural Caucasian Young Women

by

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ABSTRACT

The Believe It! program developed and evaluated by Kovalski & Horan (1999) was the first interactive, multimedia, psychological-education intervention deployed on the Internet. In a controlled study, the authors reported that the ethnically diverse cartoon models were partially successful in using cognitive restructuring to promote more reasonable career beliefs among Caucasian middle-school young women. It was not clear if the program's lack of efficacy among minority young women was due to computer literacy factors affected by SES. Subsequently, three studies explored the role of matching or mismatching the ethnicity of animated agents in a graphically enhanced program with that of the young women receiving the cognitive restructuring treatment. Each of the studies used the same four outcome measures (Occupational Sex-Role Questionnaire, Believe It Measure, Career Beliefs Inventory, and the Career Myths Scale) before and after matched and mismatched participants received the Believe It! intervention. Webster (2010) analyzed data from African-American participants, Hardy (2011) Latinas, and Zhang (2013) Asian-Americans. The current study examined the matching hypothesis on a sample of ethnically isolated Caucasian young women in a rural setting. The results obtained in the three previous studies are consistent with similar research involving client and counselor dyads (e.g., Cabral & Smith, 2011). The Believe It! program had a clear impact on ethnically matched African-American young women, whereas pairings on ethnicity did not improve outcomes for either Latinas or Asian-Americans. A solitary effect on the Occupation Sex-Role Questionnaire in the current study suggests the hypothesis is worthy of further study.

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Introduction

Internet use has continuously increased since it was first surveyed by the United States Census Bureau in 1997. The 2012 report found that 74.8 percent of households have internet access; an increase of 33 percent since the 2000 survey (U.S. Census Bureau, 2012). Furthermore, disproportionate access to the internet experienced by racial and ethnic minorities is continuing to narrow. Access to the internet, both inside and outside the home, will continue to increase with President Obama's National Wireless Initiative which attempts to ensure at least 98 percent access by 2016 (U.S. Department of Commerce National Telecommunications and Information Administration, 2011). The internet has revolutionized how the world conducts business and has become an integral part of education and everyday life; the entire world is now only a few clicks away. Already, certain forms of evidence-based therapy are available through the internet to rural populations and minorities where counselors and psychologists are less accessible. The American Psychological Association (2014) estimates that 66 percent of the 3,300 federally designated areas with a shortage in mental health providers are in rural areas.

Provasnik et al. (2007) noted that youth in rural America experience numerous restrictions to their career development and exploration activities, especially if they are from lower socioeconomic groups. For example, rural students have limited access to career counseling and college preparatory courses and they are less likely to have access to Advanced Placement and International Baccalaureate courses. Griffin, Hutchson, Meece (2011) found that rural students reported going to their parents or guardians most frequently when seeking information about their future. This finding is troubling considering parents in rural communities, in comparison to those in urban or suburban settings, are less likely to encourage their children to complete a bachelor's degree (Provasnik et al., 2007). As noted

by Dunne (1980, p. 2-3), "If young rural people by and large see only a restricted range of low-level jobs around them, they will naturally come to perceive only a narrow range of low-level jobs as realistic for themselves." This finding is likely to be more pronounced for young women considering the gender stereotypes that continue to persist. Adding to this dilemma, Corwin, Venegas, Oliverez, and Colyar (2004) noted that over extended counselors gravitate toward working closely with students in upper grades regarding career and college information. Thus, students in rural communities often choose from a restricted field of career choices limiting their futures. Griffin, Hutchson, and Meece (2011) argue for a more comprehensive approach to providing career information to rural students; college and career information should be disseminated earlier and consistently to the entire student population.

Implementing programs such as *Believe It!* (developed and evaluated in the 1990s, Kovalski & Horan, 1999) would facilitate career development for young women in rural environments. This brief web-based intervention has been readily available to minority and rural young women for over a decade. The program guides the user through an examination of the consequences of several restrictive beliefs about the future and offers alternative perspectives on career choice. The original version (Kovalski & Horan, 1999) was the first interactive-multimedia, psychological-education intervention offered via the internet; audio scripts were delivered by cartoon figures representing four ethnic groups: Latina, African American, Asian, and Caucasian. Subsequent enhancements involving flash animated agents delivering the script were explored in a series of studies.

The original study (Kovalski & Horan, 1999) suggested the program was promising for young Caucasian women but perhaps not for minority young women. The authors speculated that socioeconomic status related to unfamiliarity with computers, rather than

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ethnicity, may have been responsible. As a result of these findings, Horan and his colleagues conducted a series of studies focused on the comparative effects of matching or mismatching the ethnicity of the animated agent in the program to that of the participant. They hypothesized that participants in the matched condition would display greater rationality in their career beliefs after completion of the *Believe It!* program, in comparison to participants in the unmatched condition. Webster (2010) treated an African-American population, Hardy (2011) Latinas, and Zhang (2013) Asian Americans. As hypothesized, African-American participants showed greater improvement in their rational thinking when an African-American animated agent was utilized (Webster, 2010); this effect was strong and consistent across all four measures in the assessment battery.

In the Hardy (2011) and Zhang (2013) studies these effects were absent or weak. Hardy found no significant results indicating that matching the ethnicities of the animated agent with Latina participants produced no incremental benefit over the deliberate mismatching of ethnicities. In her independent variable manipulation analysis, Hardy (2011) unexpectedly found that 48 percent of her participants did not perceive differences between their own ethnicity and that of the Caucasian animated agent. Excluding them would reduce the statistical power of the analysis to detect possible differences. Participants in Zhang's study (2013) were able to detect the difference as intended; however, the impact of the ethnically matched animated agent was weak if evident at all. Only one of the measures showed an effect, but this significant finding washed out with a Bonferroni correction. These findings are consistent with a meta-analysis conducted by Cabral and Smith (2011) who reported that African Americans have mildly better therapeutic outcomes when matched with African-American therapists, whereas pairings based on ethnicity did not improve outcomes for any other ethnic group.

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The current study explored possible differences produced by matching an ethnically isolated population of Caucasian young women with a Caucasian animated agent. A sample of young women from rural Iowa fit this designation. Selection of this population would maximize the potential effects between the animated agents; according to Allport's (1954) classic contact hypothesis, negative attitudes toward stigmatized groups can be changed with pleasant acquaintance with a member of the group. The rural young women in our sample would presumably have lessened opportunity for such positive experiences. Therefore, any casual contact experienced with an out group member would likely reinforce negative stereotypes of this group; "we are sensitized to perceive signs that will confirm our stereotypes" (Allport, 1954, p. 264). Thus, it was expected that the Caucasian participants in the matched condition would display greater rationality in their career beliefs, in comparison to those in the mismatched condition, after completion of the *Believe It!* program.

Method

Participants

A priori power analyses conducted with G*Power revealed that a minimum sample of 52 Caucasian girls would be sufficient to detect a large effect (power = .80, alpha= .05, 2 groups). Fifty-four junior high girls from a rural Iowa community school district were recruited for this study. Six reported ethnicities other than Caucasian (Native American, Latina/Hispanic American, and other); one girl left this question blank. No participant identified as African American. To ensure an exclusively Caucasian sample, the data from these seven were discarded. An additional four girls were absent on the treatment and posttest day. Thus, the final sample consisted of 43 girls between the ages of 12 and 14 ($\bar{x}$ = 13.05, SD = .615). All participants were third generation or beyond with English as their

preferred language. Only one participant did not have access to a computer in her home. The school district chose to incorporate the *Believe It!* program into their middle school curriculum, thus acting as *loco parentis* and providing consent for each of the young women to participate. Assent was obtained from each participant prior to administration of the pre-test battery.

Table 1.
Participant Demographics (N=43)

	N	%
Age		
12	7	16.3%
13	27	62.8%
14	9	20.9%
Grade		
7	25	58.1%
8	18	41.9%
Generation in the U.S.		
3rd	3	7.0%
4th	5	11.6%
5th or beyond	35	81.4%

Measures

All paper-pencil measures in this study were used in the three previous studies (Webster, 2010; Hardy, 2011; Zhang, 2013). These were:

Demographic information. A demographic questionnaire assessed the participants' age, school grade, ethnicity, generation in the United States, language of choice, and familiarity with the internet. One additional question was added to the original measure to obtain information about whether the participant has access to a computer within her home (Appendix A).

Irrational career beliefs. The following measures were used to assess the participants' irrational career beliefs: the Believe It! Measure (Hardy, 2011), an abridged

version of the Career Beliefs Inventory (CBI; Krumboltz, 1994), an abridged version of the Career Myths Scale (CMS; Stead & Watson, 1993), and the Occupational Sex-Role Questionnaire (Kolvaski & Horan, 1999).

The Believe It! Measure assesses four items specifically addressed through the cognitive restructuring intervention of the *Believe It!* program (Appendix B; Hardy, 2011). The degree to which the participant endorses each statement is assessed using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Higher scores on this scale indicate greater irrational thinking. Pre-test internal consistency for the Believe It! Measure was .37; the fact that the four items measure distinct beliefs could be responsible for the low internal consistency. Test-retest reliability for this measure was .66.

The Career Beliefs Inventory helps individuals identify beliefs about the work world that impede effective career decision making. Twenty-six of the original 96 items were determined to be appropriate for the young women selected for this study; 12 of the items were reverse scored so the scale was equivalent on all items (Krumboltz, 1988). Higher scores, assessed by a 5-point Likert scale indicate greater rational thinking. Pre-test internal consistency for the CBI was .65.

The original Career Myths Scale (CMS; Stead & Watson, 1993), developed to evaluate the degree to which students hold certain irrational career beliefs, contains 27 items. Five of these items were relevant to the treatment goals of the *Believe It!* program (Appendix C). Each statement within this measure is rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree); higher scores indicate higher levels of irrational thinking. Pre-test internal consistency for the CMS was .66.

The Occupation Sex-Role Questionnaire (Kovalski & Horan, 1999) was used to measure the degree to which participants adhere to gender stereotypes, specific to career

choice (Appendix D). The participants' responses to the open ended questions were rated by two independent raters, a master's level counseling student and a PhD level counselor educator. Participant responses were scored and summed based on these ratings. High scores indicate greater rational thinking in regard to gender stereotypes and career choice. Inter-rater reliability was found to be Kappa = 1.00 (p < .00) for pre-test and Kappa = .960 (p < .00) for post-test. On the one item the scorers disagreed, a mutually agreed upon final score could not be determined after consultation; an average of the two scores was used for analyses.

   Character questionnaire. The Animated Agent Appearance Questionnaire (Webster, 2010) was developed specifically as an independent variable manipulation check. It consists of two questions that assess the participants' perceptions of the animated agent's ethnicity. It consists of two questions (Appendix E). This measure was only utilized as a post-test measure as it is not relevant prior to the participant completing the *Believe It!* program.

Procedures

   This study was conducted on two separate days, with approximately 20 days in between. On day one, participants were given 30 minutes to complete the pre-test battery. On day two randomly assigned participants received the intervention with either the matched (Caucasian) or mismatched (African American) animated agents depicted in the *Believe It!* program. Images of the animated agents (Jessica and Shaundra) can be seen below in Figure 1 and Figure 2 respectively. Except for the appearances of the animated agent, the two versions of the program were identical, including the script, the voice, and the background image on the computer screen. Throughout the program, participants responded to questions asked by the animated agents and were given feedback to change

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irrational career beliefs or to reinforce rational ones. Post-testing occurred after completion

of the treatment. Fifty minutes were allotted for treatment and post-testing.
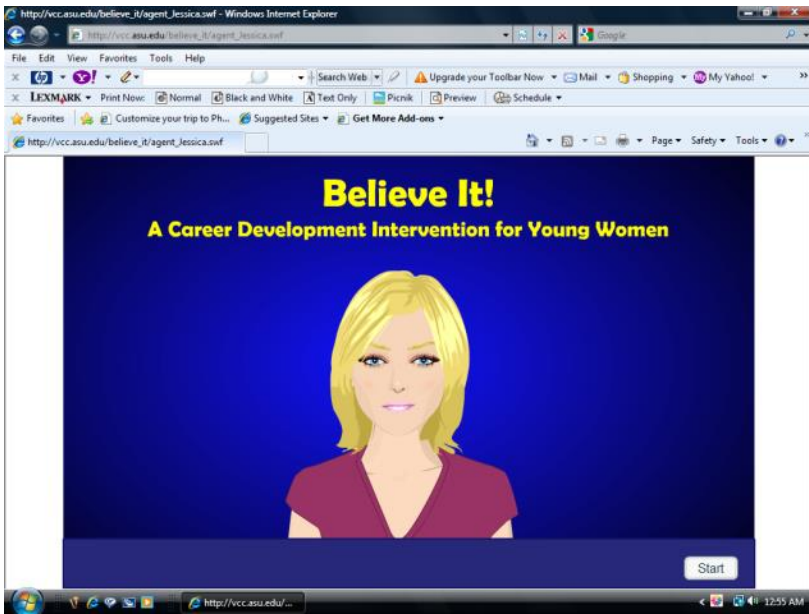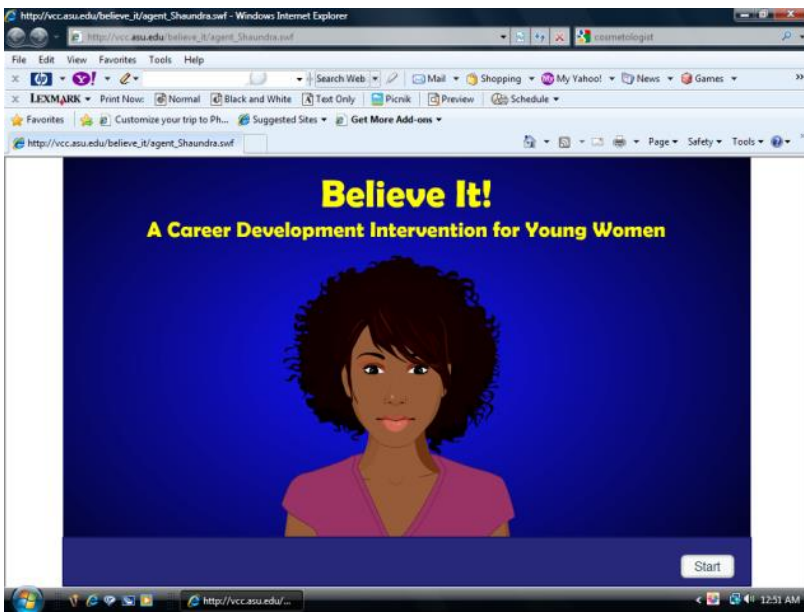

Figure 1. *Believe It!* Matched Condition

Figure 2. *Believe It!* Unmatched Condition

<center>**Results**</center>

Preliminary Analyses

A multivariate analysis of variance (MANOVA) was run to determine equivalence on the pretest scores of the matched and mismatched conditions. The MANOVA was not significant (Wilk's λ = .850, $F(4, 38)$ = 1.673, p = .176, partial η^2 = .150) indicating that random assignment was successful in producing pretreatment equivalence on all measures.

Treatment Effects

To assess whether the ethnicity of the animated agent significantly impacted the effectiveness of the *Believe It!* program, a repeated measures multivariate analysis of variance (MANOVA) was conducted on the pre-post scores of the irrational career beliefs battery. The MANOVA repeated measure effect was significant indicating that subjects improved over time in both conditions, Wilk's λ = .572, $F(4,38)$ = 7.10, p = .0001, partial η^2 = .428. However, this improvement may be attributable to any of the sources of internal validity. There was no treatment effect; neither the repeated measure effect nor a treatment effect was relevant to the hypothesis. The interaction effect directly tested the hypothesis of this study. The MANOVA interaction was not significant, Wilk's λ = .794, $F(4, 38)$ = 2.46, p = .062, partial η^2 = .206, indicating that matching the ethnicities of the animated agents and the participants produced no incremental benefit over the deliberate mismatching of ethnicities when simultaneously considering all four outcome measures.

Nevertheless, the obtained .06 level was close enough to conventional cutoffs, that further contemplation seemed warranted. Exploratory follow-up repeated measure ANOVAs were conducted in the hope of shedding light. These analyses are arguably redundant to the MANOVA; however, given the lack of consensus on whether family-wise

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error is appropriately handled by mulitivariate analyses it seemed foolish to avoid looking at them (see Bird & Hadzi-Pavlovic, 2013). The results of these analyses are presented in Table 2. The ANOVA repeated measure effects were significant for the Believe It! Measure, $F(1, 41) = 4.001$, $p = .052$, partial $\eta^2 = .089$, the Career Beliefs Inventory, $F(1, 41) = 6.139$, $p = .017$, partial $\eta^2 = .130$, and the Career Myths Scale, $F(1, 41) = 27.471$, $p = .0001$, partial $\eta^2 = .401$. Again, this indicates that the subjects in both conditions improved over time on these measures, yet this improvement may be attributable to any of the sources of internal validity. There were again no treatment effects. Pertinent to the hypothesis, a significant repeated measure ANOVA interaction was found on the Occupation Sex-Role Questionnaire, suggesting a beneficial effect for the matched condition over the mismatched condition on this measure, $F(1,41) = 7.091$, $p = .011$, partial $\eta^2 = .147$. The significant finding on the Occupation Sex-Role Questionnaire withstands the Bonferroni correction ($p = .0125$) suggesting the need for further study.

Independent Variable Manipulation Check

An independent variable manipulation analysis was conducted to determine whether participants correctly identified agent ethnicity and similarity to the animated agent within their assigned condition. Ninety-one percent (20 out of 22) of the participants in the matched condition correctly identified the animated agent (Jessica) as Caucasian, and 90% (19 out of 21) in the mismatched condition correctly identified the animated agent (Shaundra) as an ethnicity other than Caucasian. Only one participant (2%) incorrectly identified whether the animated agent's ethnicity was different from her own. Thus, the perceived similarity and ethnicity of the animated agents were endorsed in the expected manner by 91% of the sample.

Table 2
Means, Standard Deviations, and Repeated Measure ANOVAs of Matched and Mismatched
Conditions by Testing Occasion

	Pre-Test		Post-Test		Repeated Measures ANOVA	
	Matched	Mismatched	Matched	Mismatched	Repeated Measures Effect	Interaction Effect
	M (SD)	M (SD)	M (SD)	M (SD)	F (η^2)	F (η^2)
Believe It! Measure	7.86 (1.98)	7.57 (1.83)	7.18 (2.06)	7.29 (1.85)	4.00* (.089)	.671 (.016)
Sex Role Questionnaire	2.09 (1.69)	2.90 (1.81)	2.98 (1.91)	2.14 (1.74)	.040 (.001)	7.09* (.147)
Career Beliefs Inventory	92.37 (7.61)	96.00 (6.23)	95.45 (8.38)	96.90 (7.20)	6.14* (.130)	1.84 (.043)
Career Myths Scale	17.09 (2.91)	17.95 (3.40)	14.73 (2.45)	15.29 (2.26)	27.47* (.401)	.100 (.002)

*$p < .05$ $N = 43$

Discussion

The original study (Kovalski & Horan, 1999) suggested the *Believe It!* program was
effective for Caucasian young women but not for minority young women. Following this
finding, three studies (Webster, 2010; Hardy, 2011; Zhang, 2013) explored the role of
matching or mismatching the ethnicity of the animated agents in the program with that of
minority young women receiving the cognitive restructuring treatment. The *Believe It!*
program had a clear impact on ethnically matched African-American young women, whereas
pairings on ethnicity did not improve outcomes for either Latinas or Asian Americans.
These findings are consistent with research conducted by Cabral and Smith (2011) and
Moreno and Flowerday (2005). Cabral and Smith report that African Americans have mildly
better therapeutic outcomes when matched with African-American therapists, whereas

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pairings based on ethnicity did not improve outcomes for any other ethnic group. Furthermore, students of color are more likely to choose an animated agent reflecting their ethnicity when given the choice, but this pairing does not improve outcomes (Moreno & Flowerday, 2005).

The current study sought to further explore the role of matching or mismatching the ethnicity of the animated agent with an ethnically isolated population of rural Caucasian young women, another demographic that often has limited career and counseling resources. A marginally significant repeated measures MANOVA interaction warranted further contemplation. Follow up repeated measure ANOVAs revealed a significant interaction on one of the outcome measures, indicating this hypothesis is worthy of further study. Although the author aspired to obtain the sufficient N of 52 to detect a large effect size, both class size and inclement weather impacted the final $N;$ the nature of rural schools is that class sizes are small.

It is interesting to note that participants struggled to comprehend the meaning of the word ethnicity. Numerous participants inquired about the word's definition during the post-test questionnaires. Further, the school guidance counselor reported that she had to provide a definition to this word during the pre-test phase. Presumably, the participants receive limited exposure to topics regarding race and ethnicity and have restricted experience with persons fitting demographics other than Caucasian. According to United States Census Bureau statistics from 2012, 98% of individuals within the county housing this school district are Caucasian and just .6% of the population is African American. This inexperience with other ethnicities may explain the confusion in answering the questions on the independent variable manipulation check and may indicate that issues of race and ethnicity are not as salient to rural Caucasian youth, in comparison to participants in the previous studies.

The results of this study are particularly interesting given the participants' unfamiliarity with African-American individuals. Considering Allport's (1954) classic contact hypothesis, it may have been intriguing to also measure the level of prejudice held against ethnicities different from the participants at both pre and post-test evaluation of the *Believe It!* program. Future research should consider using *Believe It!* and similar interactive, multimedia interventions as a means of providing positive acquaintance experiences to ethnically isolated populations.

The current study is the first to assess the *Believe It!* program with an ethnically isolated population of rural Caucasian young women and the first to assess whether matching the animated agent to this population produces greater effectiveness. Based on the findings, the *Believe It!* program is beneficial and should be used with Caucasian populations. These findings are particularly promising for Caucasian populations in rural settings where guidance counselors are over worked, career counselors are rare, and career related resources are often hard to obtain. Women growing up in rural environments are often limited in their awareness of career opportunities; *Believe It!* and other online programs could change these pervasive patterns with little to no cost to the consumer and easily extend the benefits of counseling beyond our current limitations.

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APPENDIX A

DEMOGRAPHIC QUESTIONNNAIRE

1. What is your date of birth: _____ - _____ - _____   What are your initials? ___ ___ ___

2. How old are you? (e.g., 13, 14, 15, etc): _____

3. What grade are you in school? (e.g., 6, 7, 8, etc.) _____

4. What is your race/ethnicity (i.e., ethnicity/race)? If you identify with 2 or more, please specify in other.

   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: _____

5. What generation are you in the U.S.?

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

6. Do you have access to a computer with internet in your home?
   A. Yes
   B. No

7. Are you fluent (i.e., can you have a complete conversation) in a language other than English?

   A. Yes
   B. No

If you answered yes to question #7, please answer the questions on the following page. If you answered no to question #7, you are done. Thank you.

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

9. Which language do you most commonly speak with friends?

   A. English
   B. Spanish
   C. French
   D. German
   E. Other: _____

10. Which language do you most commonly speak with family?

   A. English
   B. Spanish
   C. French
   D. German
   E. Other: _____

11. Which language do you prefer to speak overall?

   A. English
   B. Spanish
   C. French
   D. German
   E. Other: _____

APPENDIX B

BELIEVE IT! MEASURE

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

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

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

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

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
1	2	3	4	5

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

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

APPENDIX C

CAREER MYTHS SCALE

Please circle the number that best describes how you CURRENTLY feel about each statement.
It is a sign of weakness if I am career uncertain.

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

The career I choose should satisfy significant others.

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

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

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

The selection of the right career will lead to happiness.

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

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

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

APPENDIX D

OCCUPATION SEX-ROLE QUESTIONNAIRE

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

What would you like to be when you grow up?

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

APPENDIX E

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