

The Incremental Effects of Ethnically Matching Animated Agents
in Restructuring the Irrational Career Beliefs of
Chinese American Young Women

by

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ABSTRACT

Believe It! is an animated interactive computer program that delivers cognitive restructuring to adolescent females' irrational career beliefs. It challenges the irrational belief and offers more reasonable alternatives. The current study investigated the potentially differential effects of Asian versus Caucasian animated agents in delivering the treatment to young Chinese American women. The results suggested that the Asian animated agent was not significantly superior to the Caucasian animated agent. Nor was there a significant interaction between level of acculturation and the effects of the animated agents. Ways to modify the Believe It! program for Chinese American users were recommended.

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In the United States, gender differences in occupational attainment persist (Gabriel and Schmitz, 2007). This is also true among Chinese Americans. The 2000 U. S. Census Bureau's statistics indicates significantly more Chinese American males than females are in the science-related occupations. For example, approximately 12.06% of Chinese American males compared to 7.84% of the females are in computer and mathematical occupations; moreover, 8.94% of the males compared to 2.67% of the females are in architecture and engineering occupations.

Similarly, more Chinese American females than males enter occupations traditionally considered "female" by either Chinese or American standards, including healthcare occupations (e.g., nursing aides, occupational therapy assistants, and pharmacy aides) and personal care and service occupations (e.g., animal trainers, motion picture projectionist, and amusement and recreation attendants) (US Census Bureau, 2000).

There has been a dramatic increase in the number of Asian immigrants since the Immigration and Nationality Act of 1965 (Kim, Wong & Maffini, 2010). Currently, Asian American (including those of more than one racial background) make up 5% of the total United States' population (US Census Bureau, 2010). Specifically, the number of Chinese Americans is estimated at 3.62 million (US Census Bureau, 2010). Although an increasing amount of research has focused on the psychological needs of Asian Americans, studies on vocational experiences and interventions have been inadequate. Okazaki, Kassem, and Tan (2011) identified only six articles on vocational psychology among 261 peer-reviewed studies on Asian American psychology from the previous year.

To add to the literature on culturally sensitive career interventions for Chinese Americans, the study focuses on the possibility of improving an existing career guidance

program applied to young Chinese American women. The program of interest is an online career intervention called Believe It! for adolescent females, which can be accessed for free on an Arizona State University website. Prior studies have shown that ethnic minority clients prefer counselors of similar ethnicity (Bernstein, Wade, & Hofmann, 1987; Helms, 1984). However, the differential effects of matching and mismatching clients and counselors is less clear. The present study compares the effectiveness of an Asian versus Caucasian animated agent in the Believe It! program. Two prior studies showed that Believe It! delivered by an ethnically matched animated agent worked more effectively with African American girls than a Caucasian agent, but the same did not apply to Hispanic girls (Webster, 2010; Hardy, 2011)

Previous research has demonstrated that the level of acculturation of minority clients negatively correlates with their preference for counselors of similar ethnicity (Jackson and Kirschner, 1973; Atkinson, Maruyama, & Matsui, 1978; Gambosa, Tosi, & Riccio, 1976; Gordon & Grantham, 1979; Atkinson & Matsushita, 1991). Therefore, the present study explored the potential moderating effect of acculturation on the efficacy of the Asian animated agent.

Literature Review

Development of Occupational Gender-Stereotypes

The connotation of stereotype acquired its currency from Walter Lippmann (1961). Stereotypes are what we “first define and then see...we pick out what our culture has already defined for us, and we tend to perceive...in the form stereotyped by our culture (p. 81)” Gender stereotypes are general beliefs about sex-related traits and gender roles. They denote what kind of psychological characteristics and behaviors are appropriate for either men or women (Browne, 1998).

According to Gottfredson (2005), children from the age of three onward start delineating career choices by eliminating alternatives that conflict with their self-concept, frequently without knowing what the job entails. In particular, because children aged 6 to 8 begin to recognize basic distinctions among people—one of them gender—they start to perceive different careers as being appropriate for one gender or another. In turn, the consequent perception affects the activities they choose, which reinforces this gender-based perception of preferable vocational choices. As a result, many young children unknowingly pursue activities related to careers that match their gender identity as opposed to their genetic traits (Gottfredson, 2005).

One way to compare gender-based stereotypes across cultures is by looking at how they are portrayed in the public media. Television programs in the United States and in China both portray males and females somewhat stereotypically, and the stereotypes are similar to a large extent (Browne, 1998; Fung, & Ma, 2000). The positive traits commonly portrayed of males in both cultures are competence, rationality, and assertion, while the positive traits portrayed of females in both cultures are gentleness, sensitivity to

the feelings of others, tactfulness, warmth, and expression of tender feelings. These gender stereotypes shown on TV influence children's expectation of their own gender roles, which can then be internalized as their self-beliefs (Browne, 1998; Fung, & Ma, 2000).

While it has been established that both adaptive and maladaptive career beliefs begin in early childhood, most existing career development programs focus on college and high-school populations—in which career beliefs are relatively stable. More cognitive interventions like the Believe It! should be developed and studied to help young adolescents develop rational career beliefs.

Cognitive Restructuring

Albert Ellis (1962) argued that human emotions are the result of precipitating thoughts, which can be observed as unspoken inner speech. He emphasized on changing the client's inner speech in order to change his/her thinking and ultimately change emotional outcomes.

Computer-based cognitive restructuring. Harris-Bowlsbey (1984) proposed that computer programs can serve as effective agents for cognitive restructuring, as they straightforwardly point out irrational beliefs and persuade users to adopt more rational, alternative beliefs (as cited in Horan, 1996). Horan (1996), for example, reported that computer-based cognitive restructuring enhanced high-school students' self-esteem.

Harris-Bowlsbey (1984, as cited in Horan, 1996) and Sampson (2005) predicted the increasing convenience of using computer programs to provide career guidance, as the Internet was going wireless and broadband, and computers were going handheld.

According to the U. S. Census Bureau (2009), 84.4% of Asian only households have access to the Internet at home. This high internet accessibility for Asian Americans allows them to benefit from web-based cognitive restructuring programs such as Believe It!.

The Believe It! program uses animated agents to interact with participants. A young female animated agent communicates with the user, asks questions, and offers alternative ways of thinking if her response indicates irrationality. The program intend to create a connection analogous to interpersonal relationships that will produce increased learning (Gulz & Haake, 2006; Moreno, Mayer, Spires, & Lester, 2001).

Multicultural Issues

User/animated agent ethnicity match. Studies have shown that counselor-client ethnicity match is more important to ethnic minority clients than to Caucasian clients in in-person counseling (Bernstein, Wade, & Hofmann, 1987; Helms, 1984). A large portion of the literature suggests that ethnic match is beneficial in keeping the minority client from prematurely dropping out of counseling, while it does not necessarily yield an additional benefit in treatment outcome (Coleman, Wampold & Casali, 1995; Flaskerud & Liu, 1991; Hall, Guterman, Lee, & Little, 2002). Flaskerud and Liu (1991) and Hall et al. (2002) noted that, the ethnicity match relates more directly to client satisfaction; however, shared belief system and communication style matter more than ethnic match to treatment outcome. In fact, Beutler and Bergan (1991) suggested that dissimilarity between client and counselor can facilitate client change. As for the specific population in the current study, Hall et al. (2002) observed that Asian American children aged 7 to 16 stay in counseling longer when they are matched with ethnically similar counselors. The current

study attempts to evaluate the effect of ethnicity match between the Chinese American teenage female and the animated agent in the Believe It! program. It was hypothesized that participants in the experimental group who received the Believe It! program with an Asian animated agent would have a greater reduction in irrational career beliefs than those who received the program with the Caucasian animated agent.

This hypothesis was supported in a similar study by Webster (2010) who used ethnically matched and mismatched animated agents in the Believe It! program on African American girls. In Webster's sample of 44 young women, ethnicity match constantly produced improved treatment outcome in comparison to the mismatched condition. On the other hand, a parallel study by Hardy (2011) failed to find a similar relationship with Hispanic American participants. The current study used the same procedures and measures as with Webster (2010) and Hardy (2011), to explore outcomes that might occur with Chinese American young women. It also examined the possible role of acculturation on moderating any effect of the ethnically similar animated agent.

Level of acculturation and the effectiveness of the Asian animated agents.

Acculturation is the process by which individuals adjust to a new culture (Padilla, Wagatsuma & Lindholm, 1985). As previously mentioned, counselor-client ethnicity match is important to minority clients. A closer examination of this phenomenon by Jackson and Kirschner (1973) and Parham and Helms (1981) revealed that, for African American individuals, lack of acculturation was positively correlated with preference for ethnicity match. Sanchez and Atkinson (1983) found a similar relationship for Mexican Americans. On the other hand, Ponce and Atkinson (1989) noted a lack of such within-

group difference among Mexican American college students who, at the time of the study, were enrolled in English-as-second-language classes.

Similarly, the current study explored the potential interaction of acculturation and matched ethnicity on a sample of Chinese American young women. The above mentioned studies invariably measured the preference for counselor ethnicity by participants' self-report on counselor trustworthiness after being exposed to a mock counseling session. In contrast, the current study compares the effect of ethnically different animated agents by analyzing actual treatment outcomes. Instead of exposing the participants to simulated therapy sessions, they were actually treated with either ethnically-matched or mismatched animated agents.

Research Question

The current study attempted to answer the question of whether using an Asian American animated agent in the Believe It! program was more effective in reducing Chinese American adolescent females' irrational career beliefs than using a Caucasian animated agent. First, it was hypothesized that Chinese American adolescents who were exposed to the Asian animated agent would have a greater decrease in irrational career beliefs than those exposed to the Caucasian animated agent. Additionally, it was hypothesized that less acculturated females would respond more positively to the Asian animated agent. Changes in the participant's career beliefs were measured by a battery of pre- and post-tests on separate days.

Method

Participants

Given that the Believe It! program was designed for middle-school adolescent girls, Chinese American young women currently enrolled in Grades 6 to 9 were invited to participate; 39 were recruited from a local Chinese Christian church and a local Chinese language school; of these 37 completed the pre-test, the program, and the post-test. Two participants in the matched condition did not complete the post-test for unknown reasons. Their data were excluded from the analyses.

All participants self-reported fluency in English and familiarity with the Internet; and all self-identified as part or full Chinese/Taiwanese. Participants' age ranged from 11 to 15 (Mean=13.19, SD=1.18). Table 1 details the demographics of the current sample.

Table 1.

Participant Demographics (N=37)

	<i>n</i>	%
Age		
11	4	10.8%
12	5	13.5%
13	13	35.1%
14	10	27.0%
15	5	13.5%
Grade		

6	5	13.5%
7	6	16.2%
8	12	32.4%
9	14	37.8%
Generation in the U.S.		
1st	7	18.9%
2nd	26	70.3%
3rd	3	8.1%
4th	1	2.7%
5th or beyond	0	0%

Measures

Demographic information. A demographic questionnaire developed by Webster (2010) was used to obtain information about the participants' age, grade, ethnicity, generation in the U. S., and familiarity with the Internet (Appendix A).

Level of acculturation. The Acculturation, Habits, and Interests Multicultural Acculturation Scale for Adolescents (AHIMSA, Unger, Gallaher, Shakib, Ritt-Olson, Palmer & Johnson, 2002) contains eight items that probe the participants' preferences for the cultural origins of people that they associate with, the customs that they follow, and the activities that they enjoy. For each item, participants responded with one of the following options: a) United States; b) China and/or Taiwan; c) Both a and b; d) Neither a nor b. Each "United States" response gave the participant a score of +1. Likewise, each "China and/or Taiwan" response gave the participant a score of -1. Choosing either c or

b gave a score of 0. Final scores were summed with higher scores indicating higher levels of acculturation. The AHIMSA strongly correlates with the Acculturation Rating Scale for Mexican-Americans-II (AMRSMA-II; Unger, et. al., 2002) when used with Mexican adolescents. Its internal consistency in the present study was .65.

Irrational career beliefs. The following tests were used to assess irrational career beliefs: the Believe It! Measure (Kolvaski & Horan, 1999); attenuated versions of the Career Beliefs Inventory (CBI; Krumboltz, 1994) and the Career Myths Scale (CMS; Stead & Watson, 1993); and the Occupational Gender Stereotype Questionnaire (Kolvaski & Horan, 1999). These tests were used in the original study on the Believe It! program by Kovalski and Horan (1999) and in subsequent studies by Webster (2010) and Hardy (2011).

The Believe It! measure's four items were specifically keyed to the individual modules in the program (Appendix C; Kolvaski & Horan, 1999). They address the following irrational career beliefs put forward by Woodrick (1979): 1) Children should depend on adults for their career choices (*The Myth of the Expert*); 2) There is only one career choice that will lead to satisfaction (*The Perfect Job Myth*); 3) Making a career choice means making a final decision at a specific point in time (*Beliefs of Singularity and Finality*); 4) Certain jobs are more appropriate for males than for females and vice versa (*The Myth of Sex Role*). The inventory uses a 5-point Likert scale to indicate the degree to which participants endorse each statement. Responses were summed and higher scores indicate more irrational career beliefs. Pre-test internal consistency for the Believe It! measure was .25; the fact that the four items measured distinct beliefs could be responsible for the low internal consistency.

The Career Beliefs Inventory (CBI; Krumboltz, 1991) identifies beliefs about the work world that impede effective career decision making. Reliability of the original CBI ranged from .74 to .35 over a 1-month interval, and from .68 to .27 over a 3-month interval (Krumboltz, 1991). Only 26 of the 96 items are appropriate for young adolescent women were selected for the study (Appendix E; Hardy, 2011; Kolvaski & Horan, 1999; Webster, 2010). The CBI also employs a 5-point Likert scale with higher scores indicating more irrationality in career beliefs. Fourteen out of the 26 items required reverse scoring to ensure consistency in interpreting the scores. Pre-test internal consistency of the CBI was .59.

The Career Myths Scale (CMS; Stead & Watson, 1993) contains 27 items, only 5 of which were relevant to the treatment goals of the Believe It! program (see Appendix C). The participants rated each statement on a 5-point Likert scale with higher scores indicating increased irrationality. Pre-test internal consistency for the CMS was .40.

The degree to which the participants adhere to career gender stereotypes was measured by the Occupational Gender-Stereotype Questionnaire (Kolvaski & Horan, 1999), which was also used by Webster (2010) and by Hardy (2011). This measure consists of two questions: what would you like to be when you grow up, and what would you like to be if you were a boy (Appendix C). Answering exactly the same occupation to both questions received a score of 1; multiple answers to both questions and at least one occupation in common received a score of 2; both occupations in the same field received a score of 3; multiple answers to both questions and at least one occupation in the same field resulted in a score of 4; responses with nothing in common resulted in a score of 5 (Hardy, 2011). Two master's-level counseling students scored the items

independently. Inter-rater reliability was found to be $Kappa = 1.00$ ($p < .00$) for pre-test and $Kappa = .92$ ($p < .00$) for post-test. On items where the scorers disagreed, a mutually agreed upon final score was given after consultation.

Character questionnaire. Because the participants might perceive the animated agents' ethnicity in unexpected ways, a Character Questionnaire was employed to assess success of the independent variable manipulation. Two questions were included. 1) How would you classify the ethnic/racial appearance of the character in the computer program? 2) How does the character's racial/ethnic appearance compare to your own? Participants answered the questionnaire immediately after the treatment.

Procedures

Consent was obtained from officials at the Chinese church and the Chinese language school before data collection. Girls in grades 6 to 9 took home a parent consent letter and a child assent letter that invited them to participate in a study that "evaluates the effect of an online career program on the Chinese American population." Those who brought back both letters were randomly assigned to either the experimental ($N = 19$) or control group ($N = 18$). Participants in the experimental group received the treatment program with an Asian-looking animated agent, whereas participants in the control group received the treatment with a Caucasian-looking animated agent.

The study took place on two separate days. Day One included the pre-test followed by the Believe It! program, which took most participants 20 to 30 minutes to complete. On Day Two, the post-test was administered which took most participants 10 to 20 minutes. Participants were instructed to take the Believe It! program before answering the character questionnaire on Day One. All participants took the pre-test on

the premises of the church and school campuses. Twenty-seven took the post-test at the same locations while the other 10 were emailed the post-test and took it at home. Real-time instructions were given either in person or online via instant messages. Because not every participant checked into their email account on a daily basis, time intervals between the pre-test and the post-test for each participant varied from five to ten days.

Treatment

The original Believe It! program used four different animated agents representing four ethnicities: Caucasian, Asian, Hispanic and African American. In the current study, two new programs were developed with either an Asian animated agent or a Caucasian animated agent alone. 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. Participants responded to questions asked by the animated agents and were given feedback to change irrational career beliefs or to reinforce the rational ones. For example, if the participant agreed that adults should pick the best career for her, the animated agent would respond to this belief by saying “OK, let’s see why you feel this way. Sometimes, other people’s opinions about us are right. But, sometimes they are wrong we need to decide for ourselves what’s the best career for us.” Conversely, if the participant implied little agreement with this belief, the animated agent would praise her with words such as “Great!” and then confirmed the rational way of thinking (i.e. “I’m the final decision maker for my career.”)

The response screen in the experimental and the control conditions appeared as follows (Figure 1).



Experimental group: the Asian animated agent



Control group: the Caucasian animated agent

Figure 1. Response screen of the Believe It! career program

Results

Preliminary Analyses

Attrition. All 37 participants completed all items on all four outcome measures. However, two in the experimental condition did not respond to the Character Questionnaire (Appendix G) used to check the independent variable manipulation.

Pre-treatment equivalence. Pre-treatment equivalence between the two conditions on the four measures was tested by a multivariate analysis of variance (MANOVA); no significant differences were found, Wilks' Lambda=.87, $F(4, 26) = .99$,

$p=.43$, $\eta^2=.13$. Univariate analyses of variance (ANOVA) were conducted on the four measures and corroborated pretreatment equivalence between the two conditions (Table 3).

Pre-test ANOVAs were also conducted on demographic variables. Participants in the two conditions did not differ on grade, $F(1, 35) = .10$, $p > .05$; age, $F(1, 35) = .91$, $p > .05$; generation in the U.S., $F(1, 35) = .00$, $p > .05$; or acculturation, $F(1, 35) = .07$, $p > .05$. Essentially, the two conditions were equivalent prior to receiving treatment.

Acculturation. A one-way ANOVA with treatment as independent variable suggested similar levels of acculturation between the two groups, $F(1, 35) = .07$, $p = .80$ (Table 2). Distribution of acculturation is presented in Figures 2 and 3.

Table 2.

Means, Standard Deviations, and One-Way ANOVA of Acculturation Between Conditions

	Matched M (SD)	Mismatched M (SD)	ANOVA F (p)
Acculturation Scores	1.21 (2.53)	1.44 (2.96)	0.67 (0.80)

Note. Higher scores indicate increased acculturation.

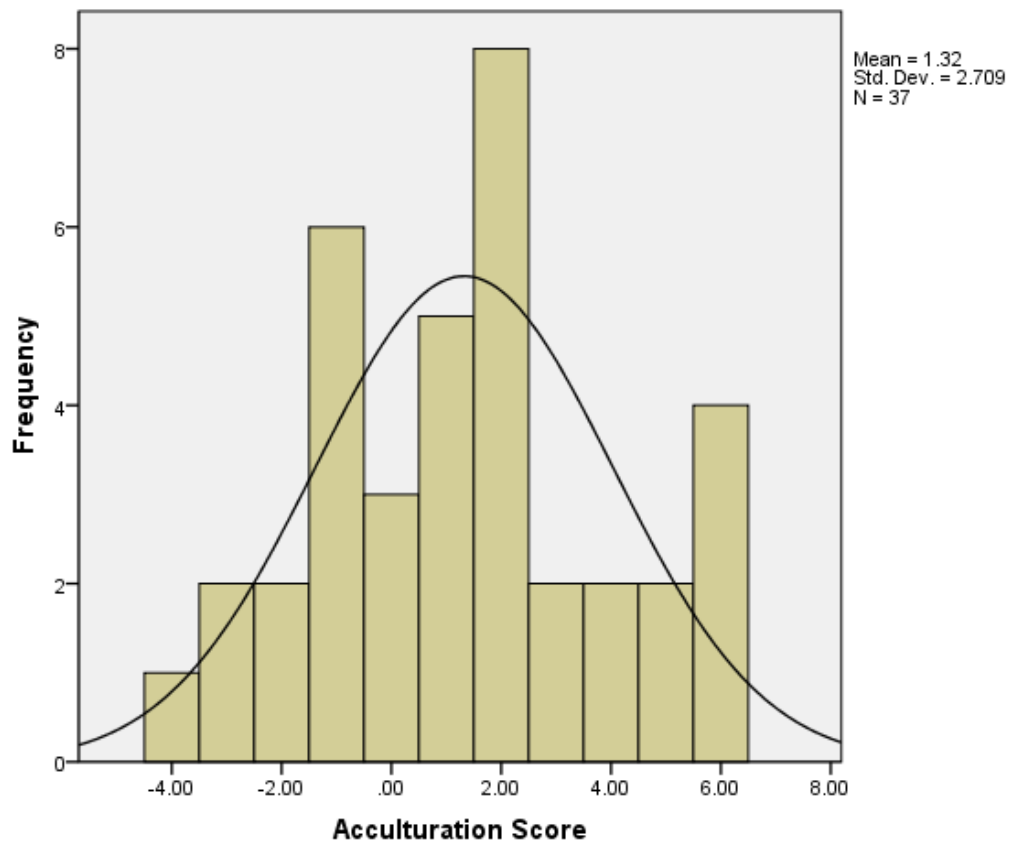


Figure 2. Acculturation score across conditions

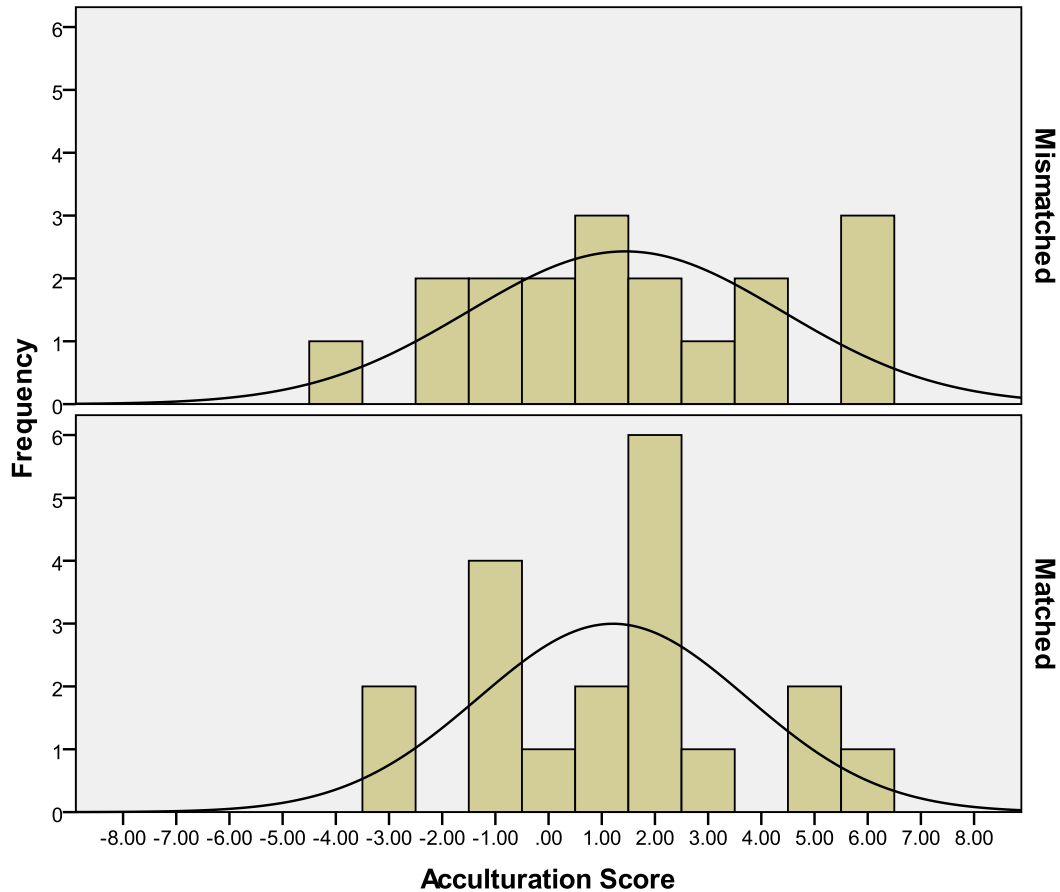


Figure 3. Acculturation scores for matched (i.e. experimental) and mismatched (i.e. control) conditions

Independent variable manipulation. Two questions were included in the Character Questionnaire to check the independent variable manipulation. 1) How would you classify the ethnic/racial appearance of the character in the computer program? 2) How does the character’s racial/ethnic appearance compare to your own?

In answering the first question, 94.4% (17 of the 18) participants in the control condition correctly identified the animated agent (Jessica) as Caucasian; 94.11% (16 of

the 17) in the experimental condition who responded to the Character Questionnaire correctly identified the animated agent (Ann) as Asian.

In response to the second question in the questionnaire, 88.9% (16 out of 18) in the control condition answered that the animated agent's ethnicity was "different" from their own, which approximates the 94.1% (16 out of 17) in the experimental condition who answered that their ethnicities are "the same".

Essentially then, we were reasonably successful in creating animated agents that were appropriately perceived by the Asian participants as either Asian or Caucasian. Perhaps more importantly, the participants overwhelmingly felt that the agents were either like or different from themselves. Although future researchers might try to ensure that the agents are universally perceived as experimentally intended, it may not be possible given the cultural and genetic diversity in any intact sample selected for study. A young biracial woman in the experimental condition, for example, might appear predominantly Caucasian, which could cause her to "correctly" perceive the animated agent's ethnicity in a manner other than was experimentally intended.

Main Analyses

Treatment effects. A multivariate analysis of covariance (MANCOVA) using pre-test scores as covariates and treatment as the independent variable was not significant (Wilk's Lambda = .95, $F(4, 28) = .37$, $p = .83$, $\eta^2 = .05$, observed power = .12), 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. Similarly, a redundant treatment-by-repeated-measures multivariate analysis of variance (MANOVA) did not produce a

significant interaction in support of the matching hypothesis (Wilk's Lambda = .99, $F(1, 35) = .37$, $p = .55$, $\eta^2 = .01$, observed power = .09). Exploratory univariate follow-up ANCOVAs and ANOVAs were run on the individual measures in the hope of shedding light on what might be occurring beneath the multivariate null effect.

A univariate ANCOVA was significant on the Occupational Gender Stereotype Questionnaire, suggesting a beneficial effect for the matching condition over the mismatching condition, $F(1, 33) = 4.24$, $p = .047$, $\eta^2 = .11$ (Table 3). The repeated-measures univariate ANOVAs yielded no significant interactions. However, the lone significant univariate finding in ANCOVA should not be interpreted as evidence for a treatment effect given that family-wise errors were not controlled. It could be construed, however, as suggesting the need for further study.

Table 3.

Means, Standard Deviations, Repeated Measures ANOVA and ANCOVA of Posttest

Differences Between Conditions (Covariate = Pretest)

	Pretest		Posttest		ANCOVA of Posttest between Conditions F (η^2) (Observed Power)	Repeated Measures ANOVA Pre-Posttest F (η^2) (Observed Power)
	Matched M (SD)	Mis- matched M (SD)	Matche d M (SD)	Mis- matched M (SD)		
Believe It! Measures	8.89 (1.82)	8.50 (1.95)	7.89 (3.18)	8.32 (3.44)	1.58 (.05) (.23)	1.25 (.04) (.19)
Career Beliefs Inventory	68.05 (6.73)	65.33 (5.82)	64.00 (8.37)	62.89 (6.26)	.22 (.01) (.08)	.58 (.02) (.11)

Career Myths Scale	16.26 (2.33)	16.28 (2.08)	16.27 (.54)	15.39 (.55)	.09 (.00) .06	1.10 (.03) (.18)
Occupational Gender Stereotype	1.74 (1.32)	1.81 (1.60)	1.37 (.27)	1.56 (.30)	4.24* (.11) .52	.07 (.00) (.06)

* $p < .05$

Note. Higher mean score indicates more irrational thinking.

Acculturation-by-treatment interactions. We also explored whether matching effects might differ as a function of the participants' level of acculturation. Multiple regression analyses on the gain score of individual measures using treatment and acculturation as the independent variable were conducted. None of the acculturation-by-treatment interactions reached significance, indicating that acculturation had no impact.

Discussion

The present study explored the possibility that the Believe It! program could be improved for minority young women by attending to role model ethnicity. Specifically, the effects of Asian and Caucasian animated agents on reducing the irrational career beliefs of Chinese American young women were assessed. Additionally, this study investigated whether level of acculturation moderated treatment efficacy.

This study failed to substantiate the hypothesis that an Asian animated agent was more effective than a Caucasian animated agent in changing the irrational career beliefs of Chinese American young women. An exploratory univariate ANCOVA produced significance on one of the four outcome measures, indicating perhaps that the hypothesis is worth further study. A larger sample size, for example, might have yielded sufficient power to detect if an effect were really there. Indeed, more participants would provide

sufficient power to detect smaller effect sizes. However, we were limited by the number of participants we were able to recruit. For example, we needed an N of 52 to detect a large effect size ($f = .40$) assuming a power ($1-\beta$) at .80 according to an analysis using G*Power (Buchner, Erdfelder, & Faul, 1997). Although we aspired to that number, we were only able to achieve an N of 37.

Therefore, it would be unwise to abandon using the Asian animated agent in the Believe It! program for Chinese American users. Though not significant, the pre-post reduction in means appeared greater for the experimental group than for the control group on three out of the four outcome measures. Additionally, the univariate ANCOVA on the Occupational Gender Stereotype Scale reached significance (Table 3). It is possible that significant benefits favoring matched over the mis-matched condition might appear with a larger sample. In the case of in-person counseling sessions, such an effect might be interpreted as both statistically insignificant and not clinically beneficial due to the forbidding expense involved in matching the ethnicities of counselors and clients. However, in a computerized counseling session, one can easily match the user of the program with an ethnically similar animated agent at a trivial expense and even add more relevant features to the animated agent used here.

The study also suggests level of acculturation did not influence the effect of the Asian animated agent. However, additional considerations may be needed. This study cited findings on in-person counseling in support of the hypothesis that less acculturated users of the Believe It! program would respond better to the Asian animated agent than the Caucasian agent (Jackson & Kirschner, 1973; Parham and Helms, 1981; Sanchez & Atkinson, 1983). Such an effect may be minimized in an online treatment where the

“counselor” had no other cultural traits beyond mere appearance. Other studies suggest that shared belief system and communication style are more important than appearance in creating a meaningful ethnic match (Flaskerud & Liu, 1991; Hall et al., 2002). If so, it is plausible that the moderating effect of acculturation may improve as the Asian animated agent becomes more culturally distinct in ways beyond appearance such as communication style and beliefs.

Similar to this study, Hardy (2011) did not find the matched animated agent to be superior to the mismatched agent in treating Hispanic girls’ irrational beliefs ($N = 52$). Her post hoc analysis with only the participants who correctly identified the agent’s ethnicity ($N = .52$) reached no significance either. On the contrary, 44 African American young women in Webster (2010)’s study responded significantly better to the matched animated agent than the mismatched agent, though the effect size was relatively small on individual measures ($\eta^2 = .10$ to $.20$).

Maramba & Hall (2002) noted that even people of the same ethnicity in different studies responded differently to being matched with an ethnically similar counselor. As Sue (1998) argued, different people in the same ethnic group may attach different importance to ethnic match. A reasonable assumption is that, because the effect of ethnic match is inherently small or unpredictable, its effect in an online cognitive restructuring program is likely unreliable.

Limitations, Implications, and Future Directions.

One of the major limitations of this study, as previously pointed out, is the constricted sample size. Even though we made interesting discoveries in favor of the

matching condition, the only way to test if a treatment effect might exist is to keep recruiting participants until sufficient power is achieved.

We suggest that future researchers of the Believe It! look beyond the animated agent's appearance to customize the program for ethnic minority users. While an ethnically matched agent is potentially beneficial and should be retained, future researchers might consider matching the agent in new areas. For example, Sue (1998) put forward the idea of "cognitive match," that is, therapist-client similarity in thinking regardless of their respective ethnicity. Sue noted that cognitive match (which is psychological) could be more powerful than ethnic match (which is demographic) in facilitating rapport. In particular, he identified shared beliefs regarding both goals and means for treatment as important ingredients of cognitive match. Therefore, if future editions of Believe It! could incorporate culturally appropriate beliefs, it might produce more beneficial outcomes.

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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).

Please choose ONE that you think the most applicable to you:

- A. Chinese/Taiwanese
- B. Chinese/Taiwanese American
- C. Other multi-racial: (please specify) _____
- D. Other: (please specify) _____

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.)

How often do you go on the internet by using a computer?

- A. Every day.
- B. Not every day but at least 3-4 days a week.
- C. Not every day but at least 1-2 days a week.
- D. Less than once a week.
- E. Less than once a month.

Have you ever used the internet independently without another person's assistance?

- A. Yes.
- B. No.

APPENDIX B
ACCULTURATION SCALE

Instruction: please complete the following statements by saying “The United States”, “China and/or Taiwan”, “Both” or “Neither”. Pick only ONE of those choices to complete the sentence.

Scoring: each “United States” response gave the participant a score of +1. Likewise, each “China and/or Taiwan” response gave the participant a score of -1. Choosing either c or b gave a score of 0.

1. I am most comfortable being with people from...
2. My best friends are from...
3. The people I fit in with best are from...
4. My favorite music is from...
5. My favorite TV shows are from...
6. The holidays I celebrate are from...
7. The food I eat at home is from...
8. The way I do things and the way I think about things are from...

APPENDIX C

BELIEVE IT! MEASURE

Instruction: please select the number that best describes how you CURRENTLY feel about each statement.

Scoring: the measure uses a 5-point Likert scale. Responses were summed with higher scores indicating more irrational career beliefs.

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 D

OCCUPATIONAL GENDER-STEREOTYPE QUESTIONNAIRE

Instruction: please respond to the following questions by writing your answer in the blank space provided.

Scoring: to maintain the consistency that associate lower scores with less irrational thinking, answering exactly the same occupation to both questions received a score of 1; multiple answers to both questions and at least one occupation in common received a score of 2; both occupations in the same field received a score of 3; multiple answers to both questions and at least one occupation in the same field resulted in a score of 4; responses with nothing in common resulted in a score of 5 (Hardy, 2011). Two master-level students in the counseling major scored the items independently. Inter-rater reliability was found to be Kappa = 1.00 ($p < .00$) for pre-test and Kappa = .92 ($p < .00$) for post-test. On the one item where the scorers disagreed, a mutually agreed upon final score was given after consultation.

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 E
CAREER BELIEFS INVENTORY

Instruction: 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. Please indicate the response that best describes how you feel about each statement.

Scoring: the inventory uses a 5-point Likert scale. Responses were summed with higher scores indicating more irrational career beliefs.

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.
- ___ 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.

APPENDIX F
CAREER MYTHS SCALE

Instruction: indicate the response that best describes how you feel about each statement.

Scoring: the scale uses a 5-point Likert rating. Responses were summed with higher scores indicating more irrational career beliefs.

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.

APPENDIX B
CHARACTER QUESTIONNAIRE

Instruction: 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

