

The Effectiveness of an Internet-Based Career Development Program:
The Impact of Matching Animated Agent Ethnic Appearance

by

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ABSTRACT

The current study is a follow up to a previous evaluation of *Believe It!*, an internet-based career development program for adolescent girls. This study attempted to extend the program's effectiveness by manipulating animated agent appearance based on literature suggesting that agent appearance has implications for human-computer program interface. Participants included 52 Latinas (ages 11 to 14) randomly assigned to view one of two versions of the revised career program. Each version contained identical content but included animated agents designed to represent different ethnicities. Pre and post-treatment scores for three career belief measures and an occupational stereotype measure were analyzed using a MANCOVA. The results were not significant and further analyses revealed that the results were confounded by complications with the perceived ethnicity of the animated agents. Despite a lack of significance the results provide enriching information about Latina adolescent perception of ethnicity.

DEDICATION

This dissertation is dedicated to the Naranjo and Hardy families for inspiring me to pursue my dreams. I especially extend gratitude to my mother Rita Naranjo for always believing in me and for using tricky strategies to encourage my love of learning. She helped me establish a work ethic that helped me persevere through graduate school. Lastly, I dedicate my dissertation to my grandpa Willie Naranjo who dreamt of seeing a grandchild graduate from college. I know that he would be proud of what I have accomplished. I thank you all for your love and support!

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Chapter 1

LITERATURE REVIEW

Introduction

The gender-roles of women pertaining to work and family have drastically changed in the United States. Women are now employed in positions previously dominated by men and are projected to account for 55 percent of workforce growth from 2002 to 2012 (U.S. Department of Labor, 1992-1993; U.S. Bureau of Labor, 2004). However, despite changing workforce demographics and an increased number of career options, women still face unique barriers that restrict their career choices (Betz, 1992). In particular, irrational career beliefs can be detrimental to the career development of women and are of particular interest in this study. The general consensus is that beliefs influence career-related behavior (e.g., Fishbein & Ajzen, 1975; Keller, Biggs, & Gysbers, 1982; Krumboltz, 1979), which implies that irrational career beliefs have the potential to influence how people prepare for future employment. To address cognitive barriers that may inhibit constructive career behaviors of women the field must continue to develop and refine interventions like *Believe It!*, a career development program designed to address maladaptive career beliefs of adolescent girls.

Career Development

Career development begins long before a person selects a career as a young adult, yet research on career-related interventions typically focuses on college and high school aged students. Focusing on older adolescents is interesting when you consider research suggesting that occupational choices of

young adults are influenced by early experiences (e.g., Eccles et al., 1983; Lent, Brown, & Hackett, 1994) and that career aspirations of children can be relatively stable and are commonly achieved by adulthood (Trice, 1991; Trice & McClellan, 1993). Unfortunately, children often develop beliefs that limit career aspirations (Helwig, 1998; Moore & Nagle, 1994; Taber, 1992). Beliefs that develop in childhood can be difficult to change because they become so ingrained that they are accepted as absolute truths (Krumboltz, 1991). Therefore it makes logical sense to challenge irrational career beliefs of children and young adolescents to expand their career aspirations and career-related behaviors.

It has been theorized that the type of career a woman pursues and/or avoids (e.g., science or math careers) is partly influenced by socialized gender beliefs (Martin & Ruble, 2004). In a longitudinal study of 2000 children, Eccles, Barber, and Jozefowicz (1999) found that gender socialization influenced long-term goals. Children consider information about gender and social class and then use the information to identify “appropriate” career goals (i.e., occupational stereotyping; Eccles, 1994). The impact of gender beliefs is evidenced in research indicating that children often change their occupational preference when asked to imagine they are of the opposite sex (e.g., Tremaine, Schau, & Busch, 1982; Stockard & McGee, 1990). It appears that beliefs based on occupation stereotypes have implications for the development of the person’s vocational identity (Phillips & Imhoff, 1997).

Irrational Career Beliefs

Whether rational or irrational, beliefs affect the way each person views and

approaches career-related options and activities (Krumboltz, 1979; 1991). Beliefs are essentially schemas people use to organize perceptions about the self and the world. Krumboltz (1991) indicates that

The way in which people make career decisions, search for jobs, and seek promotions depends on what they believe about themselves and the world of work. If their beliefs are accurate and constructive, they will act in ways that are likely to foster the achievement of their goals. If their beliefs are inaccurate and self-defeating, they will act in ways that make sense to them but may hinder the accomplishment of their goals (p. 1).

Maladaptive thoughts have been referred to as irrational beliefs (Kovalski & Horan, 1999), dysfunctional cognitions (Corbishley & Yost, 1989), misconceptions (Thompson, 1976), irrational expectations (Nevo, 1987), myths (Lewis & Gilhousen, 1981; Woodrick, 1979), and dysfunctional career beliefs (Kinnier & Krumboltz, 1986). Regardless of terminology, an irrational career belief “inhibits career problem solving and decision making” (Sampson, Peterson, Reardon, & Saunders, 1996, p. 2). These beliefs restrict constructive career behavior and are associated with self-defeating behaviors (Kinnier & Krumboltz, 1986; Krumboltz, 1981). Research shows that irrational career beliefs are associated with perfectionism, over-generalizations, and decreased life satisfaction (Sampson, Peterson, Reardon, & Saunders, 1996). Career beliefs have also been associated with career differences pursued by men, women, and people of different ethnicities (Eccles et al., 1983; Gottfredson, 1981; Lent, Brown, & Hackett, 1994; Savickas, 2005).

Assessments like the Careers Belief Inventory (CBI; Krumboltz, 1991), the Career Myths Scale (CMS; Stead, 1991), and the Career Thoughts Inventory

(CTI; Sampson et al., 1996) were designed to help therapists identify irrational career beliefs. Once irrational beliefs are identified, interventions can be implemented to challenge and replace the maladaptive beliefs. Interventions designed to address and modify irrational beliefs typically include some form of cognitive restructuring. According to Kinnier and Krumboltz (1986) cognitive restructuring is a process of, “uncovering or identifying maladaptive thoughts or beliefs that are irrational, exaggerated, or inaccurate and then correcting or modifying them so that they become more adaptive, rational, realistic, or accurate” (p. 231-313). Cognitive interventions stem from Rational Emotive Behavioral Therapy (REBT; Ellis, 1970) and Cognitive Behavioral Therapy (CBT; Beck, 1976). REBT and CBT are based on the premise that an individual’s beliefs mediate the relationship between an experience/event and the consequences (Ellis, 1970). In order to change a person’s behavior and/or affect (i.e., the consequence), the person must alter their beliefs. The concept of irrational beliefs in REBT and CBT is similar to the concept of irrational career beliefs in that they each have the potential to limit constructive behavior.

Computer-Based Interventions

Studies on cognitively mediated interventions indicate that cognitive restructuring offers empirical promise. Cognitive techniques are associated with reductions in irrational beliefs regarding indecision, self-esteem, and self-concepts (e.g., Hooper & Layne, 1985; Knaus & Bokor, 1975; Stead, Watson, & Foxcraft, 1993; Warren, McClellan, & Ponzoha, 1988). However, studies on cognitive restructuring typically focus on non-career related beliefs. Mitchell and

Krumboltz (1987) were the first to design experimental studies evaluating the effect of cognitive restructuring on career misconceptions. Their results indicate that a cognitive approach effectively reduced anxiety about career decisions and increased career-related behaviors in a population of college juniors and seniors. The intervention exceeded the benefits of decision-making training and a control condition. Unfortunately, cognitive restructuring can be labor intensive and requires a level of expertise. Therapists trained to administer standardized cognitive restructuring protocols are pressed to learn assessment questions and must generate impromptu responses to irrational statements for a variety of clinical issues. Evidence suggests that computer and internet-based cognitive restructuring programs are a viable option to the time intensive human led intervention (Horan, 1996; Kovalski & Horan, 1999) and the use of computer-based counseling interventions with students has been supported (e.g., Harris-Bowlsbey, 1983; Maze & Cummings, 1982). Due to advancements in technology computers are now capable of assessing irrational beliefs and delivering appropriate cognitive restructuring scripts. For example, Horan (1996) examined an internet-based cognitive restructuring intervention and found that the program produced anticipated changes in self-esteem beyond a relaxation condition. Kovalski and Horan (1999) evaluated a career focused cognitive restructuring intervention and found that the program effectively reduced self-stereotyping beliefs of Caucasian adolescents. Interestingly the program did not reduce irrational beliefs of ethnically diverse minorities. The observed treatment-by-ethnicity interaction suggests that the online cognitive program can effectively

reduce irrational beliefs, but draws attention to factors that may mediate the program's effectiveness with minority adolescents. The aforementioned study draws attention to ethnicity as a relevant factor in computer-mediated counseling interventions; however, the field currently lacks studies in this area.

Ethnicity as Mediating Factor

The implication of similarity between client-counselor, student-instructor, and animated pedagogical agents- program user has been a hot topic within research. Matching factors such as gender, language, race, and ethnicity have been of continued interest in multicultural research (e.g., Bernstein, Wade, & Hoffman, 1987; Hall, Guterman, Lee, & Little, 2002; Sue, Fujino, Hu, Takeuchi, & Zane, 1991). Research on modeling indicates that similarity between an observer and a model increases the probability that the observer will mirror the actions of the model (Schunk, 1987). The similarity-attraction hypothesis (SAH) further posits that humans are more likely to be attracted to those who have similar characteristics than to others that are dissimilar (Byrne & Nelson, 1965), thus increasing the likelihood of integrating information shared by that individual. Similarity is also purported to increase interaction and attention (Berscheid & Walster, 1969; Hartz, 1996; Suler, 1999).

The impact of matching race and ethnicity in counseling interventions is still unclear due to equivocal findings (e.g., Abreu & Gabarain, 2000; Atkinson, Casa, & Abreu, 1992; Atkinson, Ponce, & Martinez, 1984; Gamboa, Rosi, & Riccio, 1976; Sattler, 1977; Sue, Fujino, Hu, Takeuchi, & Zane, 1991). Research indicates that ethnic minorities express a preference for therapists who are

ethnically similar (e.g., Atkinson, Poston, Furlong, & Mercado, 1989; Bernstein, Wade, & Hoffman, 1987; Sattler, 1977). For instance, Atkinson, Ponce, and Martinez (1984) indicate that Mexican American college students prefer ethnically similar counselors regardless of acculturation level. Santiago-Rivera, Arredondo, and Gallardo-Cooper (2002) state that, “Matching undoubtedly provides the first step toward strengthening a therapeutic relationship by bringing about a commonality between client and counselor” (p. 108). Additional studies indicate that matching a client and therapist by ethnicity is associated with improved treatment outcome (e.g., Hall, Guterman, Lee, & Little, 2002; Sue, Fujino, Hu, Takeuchi, & Zane, 1991). In a study of minority clients who sought outpatient treatment services, treatment length was associated with ethnic match for Asian Americans, Black-Americans, and Mexican-American adults (Sue, Fujino, Hu, Takeuchi, & Zane, 1991). The results also indicate that client-counselor ethnic similarity was associated with improved treatment outcomes for Mexican-American adults. The aforementioned results highlight the potential benefits of matching counselor-client dyads by ethnicity.

Evidence suggests that the implications of similarity extend beyond human relationships to interactions with animated computer agents. Computer applications have become increasingly sophisticated since their inception and are no longer restricted to plain text or simple motionless computer characters. Today’s multimedia instructional environments include lifelike animated computer characters designed to interact with program users. Animated pedagogical agents (i.e., animated agents) are designed to facilitate learning in

computer-mediated environments (Baylor, 2005; Moreno, Mayer, Spires, & Lester, 2001). Animated agents promote student learning by offering guidance, providing feedback, and serving as models for students (Moreno, 2004). Studies on the use of animated agents indicate that the appearance of an agent has implications for human interface with computer programs. Similar to research on counselor-client preference, studies indicate that ethnic minorities are more likely to select animated agents that appear to be of the same ethnicity (Baylor, 2005; Moreno & Flowerday, 2005). When asked why they selected the agent, ethnic minority college students were more likely to indicate that they made their selection based on the ethnic and gender appearance of the agent (Baylor, 2005). The gender and ethnicity of animated agents are also related to perceptions regarding how enthusiastic or motivational the agent appears (Baylor, Ryu, & Shen, 2003). Main effects for agent and ethnicity indicate that agents that are designed to appear as an ethnic minority facilitated increased learning (Baylor, 2005). Other studies challenge the similarity-attraction hypothesis and indicate that ethnic similarity between animated agents and program users does not impact learning in a multimedia environment (Moreno & Flowerday, 2005). Results are inconsistent but Baylor (2005) indicates that ethnicity and gender may influence how programs users respond to system interfaces.

Purpose

Cognitive restructuring interventions like *Believe It!* are similar to multimedia learning programs in that they attempt to teach the program user through interaction and dialogue. The program can also be compared to career

counseling led by an animated agent rather than a live therapist. Given the literature on the implications of client-counselor matching and animated agent ethnicity in media learning environments, the phenotypical appearance of animated agents in the counseling intervention *Believe It!* may have been an influential factor resulting in the treatment by ethnicity interaction discovered in the original study of this program (Kovalski & Horan, 1999). As a result, the current study will examine the implications of matching and mismatching the ethnic appearance of animated agents depicted in the *Believe It!* program with a population of ethnically diverse (Latina) adolescents. It is hypothesized that matching animated agents designed to appear phenotypically similar to Latina adolescent program users will significantly reduce the irrational career beliefs and occupational gender stereotypes addressed by the *Believe It!* program in comparison to a control condition led by an animated agent designed to appear ethnically different.

Chapter 2

METHOD

Sample

Approximately 154 adolescents attending middle schools, after-school clubs, and churches located in the Southwest participated in this study. For the purpose of this study analyses were based on the responses of 52 self-identified Latina/Hispanic American participants between the ages of 11-14 (mean age 12.87 with a standard deviation of .95). See Table 1 for demographic information.

Table 1
Participant Demographics ($n = 52$)

	<i>n</i>	Percent
Age		
11	5	10%
12	12	23%
13	20	38%
14	15	29%
Grade		
5 th	3	6%
6 th	5	10%
7 th	14	27%
8 th	29	56%
9 th	1	2%
Generational Status		
1 st	10	19%
2 nd	28	54%
3 rd	5	10%
4 th	1	2%
5 th or beyond	8	15%
Spanish Fluency		
Yes	40	77%
No	12	23%

Procedure

Consent was obtained from school/church/club officials prior to data collection efforts. Potential participants were given a week to turn in a completed assent form and a completed parental consent form. Once consent and assent were obtained, the participants completed an online pretest battery that included attenuated versions of the Career Beliefs Inventory and the Career Myths Scale, as well as the Believe It measure, and the Occupational Sex-Role Questionnaire. Participants also completed a demographic information sheet. All measures were completed in a computer lab within the participant's school/church/club. A week after completing the pretest battery, the participants were randomized to either the experimental or control condition. The participants viewed either the matched (i.e., experimental) or mismatched (i.e., control) version of the *Believe It!* program in the computer lab. Upon completion of the intervention, the participants completed an online post-study battery (i.e., the CBI, CMS, Believe It measure, and Occupational Sex-Role Questionnaire) along with the Character Questionnaire.

The original version of *Believe It!* included four animated characters designed to represent different ethnic groups (e.g., Caucasian, African American, Asian, and Latina/Hispanic). For the purpose of this study the program was modified into two separate versions each led by a single animated agent. The current versions also included slight script modifications. The only difference between the two updated versions was the physical appearance of the animated agent and the agent name. Since there is no single set of features that represents

every person within an ethnic group the animated agents utilized for the purpose of this study were based on stereotypical features of Latinas and Caucasians in the Southwest. Specifically, the Latina agent was designed to resemble the darker features of indigenous descendents of the Mexican American population (e.g., tan skin and dark hair; see Figure 1). The Caucasian agent was based on stereotypical European features (e.g., blue eyes and blonde hair; see Figure 2). To further emphasize agent ethnicity the names were selected carefully. The Latina agent was given a common Latina name (e.g., Maria), which was enunciated based on Spanish alphabet pronunciation. The Caucasian agent introduced herself as Jessica. Self-identified Latina participants assigned to the matched condition viewed the program with the Latina agent while the mismatched condition viewed the phenotypically Caucasian animated agent.



Figure 1. *Believe It!* Matched Condition Animated Agent.



Figure 2. *Believe It!* Mismatched Condition Animated Agent.

Each program guided the participants through four cognitive restructuring modules focused on the following beliefs:

1. The first module addressed the *Myth of the Expert* (Woodrick, 1979). The myth is based on the belief that adults in the adolescent's life can pick the right career for the adolescent because the adult knows what's best. The module also addressed, *My Vocation Should Satisfy Important People in My Life*, a common irrational expectation identified by Nevo (1987).
2. The second module addressed the *Perfect Job Myth*, which is the belief that there is one perfect job for an individual (Woodrick, 1979). This module also addressed the *Myth of Vocational Success and Happiness*, which is based on the belief that happiness stems from career success (1979).
3. The third module covers *Beliefs of Singularity and Finality*, which are based on the idea that career decisions are made at a single point in time

and that it is best to make a decision sooner rather than later (Thompson, 1976). The module also challenged the *Myth of Decision-Making as an Event*, which is based on the premise that a career decision is an event that takes place in a single moment. The belief ignores career development as a process (Woodrick, 1979).

4. The last module challenged *The Myth of Sex Roles*, which pertains to stereotypes that restrict women from considering a career that is traditionally held by men (1979).

Each program version began with an introduction given by the animated agent. The agent introduced herself (i.e., Maria or Jessica) and welcomed the participant to the program. After the introduction, the animated agent verbally presented an irrational career belief. The participants were then queried, “Do you ever feel this way?” and were given the following options: “Usually,” “Sometimes,” “Never,” and “Tell me more.” If the participant selected “Never” the animated agent rewarded her by saying “great” and would then give an example of constructive self-talk. The participant was then given the option to move on to the next module or to view the module again. Girls that selected “Usually,” “Sometimes,” or “Tell me more” were directed to cognitive restructuring dialogue. The animated agent challenged the stated irrational career belief by providing an example of a rational perspective. At this point the participants were asked, “Does that make sense” and were given the following options: “I don’t get it,” “I kinda get it,” “Yes, I understand,” and “Tell me more.” If they selected, “Yes, I understand” the animated agent praised their selection by

saying “good” and then provided an example of constructive self-talk. Girls that selected, “I don’t get it,” “I kinda get it,” or “Tell me more” received additional cognitive restructuring dialogue. The girls were then instructed to select the “Continue” button and were directed to the next module. The sequence of feedback provided by the animated agent was tailored to the endorsement or absence of irrational career beliefs expressed by each participant.

Measures

Career Beliefs Inventory

The *Career Beliefs Inventory* (CBI) is an attenuated version of the original 96-item questionnaire (Krumboltz, 1991). For the purpose of this study, 26 items were selected based on relevance to the 4 career beliefs addressed by the *Believe It!* program. The measure included a five-point response format ranging from 1 (strongly disagree) to 5 (strongly agree) and took approximately 10 minutes to complete. Twelve of the 26 items required reverse scoring. Lower scores were indicative of irrational career beliefs. The validity of the instrument is based on an inverse relationship between CBI scores with career commitment scores and career decision-making (Mental Measurements Yearbook, n.d.). The CBI has also been found to be conceptually different from measures of personality and interest (Krumboltz, 1991). The test-retest reliabilities of the full measure range from .35 to .74 after a month and from .27 to .68 after 3 months. The reliability of the original measure has been described as “acceptable but nothing to rave about” (Walsh, 1994, p. 432) but the internal consistency for the attenuated CBI reflected good reliability with an alpha of .82.

Career Myths Scale

The *Career Myths Scale* (CMS; Stead, 1991) consists of a five-point likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores reflect an increased number of irrational thoughts. The shortened version utilized for the purpose of this study included 5 items selected from the original 27 CMS questions. The items were selected based on relevance to the beliefs addressed by *Believe It!* program. Stead (1991) indicates that the concurrent validity of the full instrument is supported by correlations of the CMS with the Idea Inventory, a measure of general irrational beliefs (Kassinove, Crisci, & Tiegerman, 1977). The internal consistency for this 5-item measure was low with an alpha of .57, which is not unexpected. Although the measure is designed to assess the presence of irrational career beliefs, the poor reliability is likely due to the low number of items and the fact that each question addresses distinct irrational career beliefs that are not necessarily related.

Believe It

Believe It was specifically designed for the purpose of this study and included items based on the 4 beliefs addressed in the *Believe It!* program. The four-item measure is based on a likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). Responses were summed with higher scores indicative of the presence of irrational beliefs. Like the CMS the measure assesses distinct irrational career beliefs and the endorsement of one irrational belief does not necessarily imply that the individual will also endorse the 3 other beliefs. The internal reliability with the study population resulted in an alpha of .44.

Occupational Sex-Role Questionnaire

The *Occupational Sex-Role Questionnaire* included two questions and was developed by Kovalski and Horan (1999) for the original evaluation of the *Believe It!* program. The first question asked the participant to consider, “What would you like to be when you grow up.” The question was followed by a space for the participant to respond. The second question asked the participant, “If you were a boy, what would you like to be when you grow up” and included another space for the participant to respond. The participant’s responses were scored and summed based on the ratings of two independent raters. The answers were scored based on the following scoring instructions: Responses that reflect the exact same profession receive a 5; Responses with multiple answers that include at least one profession in common receive a 4; an answer that includes professions in the same field receive a 3; 2 points are given for multiple responses if at least one of the professions is in the same field; responses that have nothing in common are scored 1; and responses that indicate that the participant is uncertain/unsure should not be scored. Inter-rater reliability was perfect at pretest, $r = .10$, and $.99$ at posttest.

Demographic Questionnaire

The questionnaire was designed for the current study and included questions about ethnicity/race, age, gender, generational status, and language.

Character Questionnaire

The *Character Questionnaire* was designed for purpose of this study and contained two questions. The first question asked participants to select the

ethnicity/race of the animated agent depicted in the *Believe It!* program as Euro-American/Caucasian, Latina/Hispanic American, African American/Black, Asian American (East Asian), Native American, or Asian American (Middle East). The second question asked participants whether they viewed the animated agent's ethnicity to be the same or different from their own.

Chapter 3

RESULTS

Preliminary Analyses

Pretreatment equivalence was addressed by multivariate analysis of variance (MANOVA) run on the four pretests of the matched and mismatched conditions. The MANOVA was not significant, a Wilk's Lambda, $F(4, 41) = 1.26$, $p > .05$, indicating no overall differences on the entire battery. Pretest internal consistencies on the BI and the attenuated CBI, and CMS were .44, .82, and .57, respectively.

At this point we could have moved to an analysis of treatment effects, however, a large visual disparity between the treatment conditions on the Career Myths Scale pretest (CMS; see Figure 3) suggested that univariate ANOVAs on the pretests be run. A significant pretest difference between treatment conditions on the CMS, $F(1, 48) = 4.82$, $p < .05$, $\eta^2 = .09$ was found. All other ANOVAs were insignificant (see Table 2).

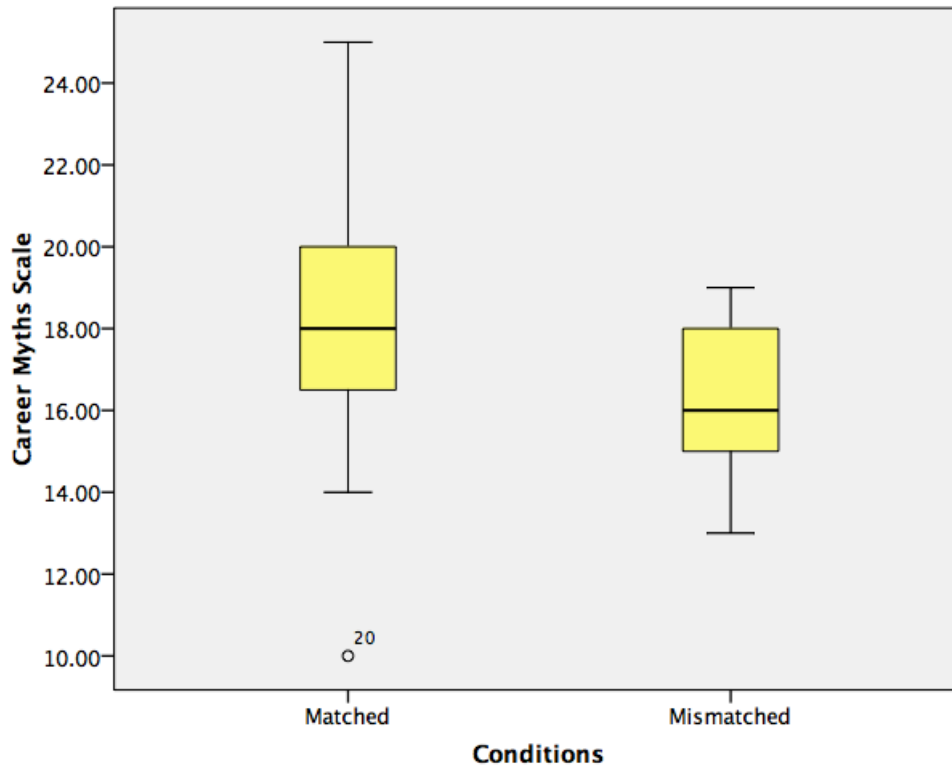


Figure 3. Boxplot of Career Myth Scale scores between Conditions.

Table 2

Means, Standard Deviations, and ANOVA Pretest Differences between Conditions

	Matched	Mismatched	ANOVA
	M (SD)	M (SD)	<i>F</i>
Career Beliefs Inventory	103.00 (11.75)	98.87 (7.98)	2.06
Believe It! Questionnaire	10.82 (3.32)	10.09 (2.31)	.80
Career Myths Scale	18.04 (3.24)	16.32 (1.94)	4.82*
Sex Role Questionnaire	3.79 (3.19)	3.25 (2.92)	.35

* $p < .05$

Lower scores on the CBI and higher scores on the BI and CMS indicate stronger irrational beliefs. Lower scores on the SRQ suggest gender stereotyping.

Treatment Effects

The univariate pretest difference on the CMS suggested that covariance analysis would be the preferred approach to assessing treatment effects. Therefore, a multivariate analysis of covariance (MANCOVA) using pretests as covariates was conducted on the posttest scores of the matched and mismatched conditions. The MANCOVA was not significant, $F(4, 36) = .20, p > .05$, indicating that matching the ethnicities of the animated agents and the participants produced no incremental benefit over the deliberate mismatching of ethnicities.

A variety of exploratory analyses were run in the hope of shedding light on the unexpected null effect. First, univariate “follow-up” ANCOVAs were run on the four outcome measures; again, all were not significant (see Table 3). Then, a treatment by repeated measures MANOVA, $F(1, 41) = 1.08, p > .05$, also failed to produce an omnibus interaction indicating beneficial effects attributable to the matched treatment condition (f, df, etc). Nor did any similar “follow-up” univariate repeated measures ANOVAs.

These exploratory analyses, of course, are entirely redundant to the MANCOVA conducted on the four outcome measures. They were undertaken because there is no uniformity of opinion on whether family-wise error is appropriately handled by multivariate analyses. Also, there are strong preferences in the research community on the appropriateness of covariate analyses versus repeated-measure analyses of variance. Regardless of such opinions, all analytic roads followed here led to the same null effect.

Table 3
Means, Standard Deviations, Repeated Measures ANOVA and ANCOVA of
Posttest Differences Between Conditions (Covariate = Pretest)

	Pretest		Posttest		ANCOVA of Posttest btwn Conditions <i>F</i> (η^2)	Repeated Measures ANOVA Pre- Posttest <i>F</i> (η^2)
	Matched	Mis- matched	Matched	Mis- matched		
	M (SD)	M (SD)	M (SD)	M (SD)		
Career Beliefs Inventory	103.00 (11.74)	98.87 (7.98)	93.93 (13.71)	92.22 (9.05)	.18 (.00)	.89 (.02)
Believe It! Questionnaire	10.83 (3.32)	10.09 (3.31)	9.60 (3.24)	8.04 (1.94)	3.68 (.07)	1.47 (.03)
Career Myths Scale	18.04 (3.24)	16.31 (1.94)	17.21 (3.60)	16.48 (2.81)	.25 (.00)	1.32 (.03)
Sex Role Questionnaire	3.79 (3.19)	3.25 (2.92)	4.26 (3.57)	3.59 (3.00)	.01 (.00)	.03 (.00)

* $p < .05$

Independent Variable Manipulation Check

Treatment conditions were based on the manipulation of animated agent phenotypical appearance and name. Independent variable manipulation was evaluated to determine if participants correctly identified agent ethnicity and similarity in a manner consistent with the condition assigned (e.g., The Latina participants in the matched condition identified the agent as Latina and indicated that the agent was similar to herself. Those Latinas in the mismatched condition identified the agent's ethnicity as Caucasian and indicated that the agent was different than herself). This exploratory procedure produced a conspicuous loss of subjects especially in the mismatched condition: (Matched = 25 remaining and Mismatched = 11 remaining). In respect to perceived ethnicity, 86% ($n = 25$) of

participants in the matched condition correctly identified the agent's ethnicity as Latina/Hispanic while just 52% ($n = 12$) of Latina participants in the mismatched condition correctly identified the agent's ethnicity as Caucasian. The other 48% ($n = 11$) identified the Caucasian agent as Latina/Hispanic. Independent of how the participants identified agent ethnicity, 87% ($n = 45$) perceived the agent as the "same" or "different" in a manner consistent with the condition assigned. The perceived similarity and ethnicity of the animated agents were not endorsed by this sample in the manner expected. Overall, just 36 of 52 participants responded to the conditions as expected.

Post Hoc Analyses

Although the Latina and Caucasian animated agents appeared obviously representative of their respective ethnic groups to all researchers associated with this study that was not necessarily the case with study participants. Since the logic of each treatment's connection to the outcome measures demanded that the participants accurately perceive their ethnic connectedness to the animated agent, a case could be made to exclude from the overall analysis any participant who did not correctly perceive agent ethnicity or similarity consistent with the condition assigned. Therefore, three exploratory analyses were conducted based on the following criteria. The analyses included:

1. ANOVA on subjects based on report of agent similarity.
2. ANOVA on subjects based on reported agent ethnicity.
3. ANOVA on subjects that correctly identified agent similarity and ethnicity based on condition assigned.

These exploratory procedures also produced a conspicuous loss of subjects especially in the mismatched condition. In the first analysis, Matched = 32 remaining and Mismatched = 20 remaining. In the second analysis, Matched = 36 remaining and Mismatched = 16 remaining. The last analysis included a significantly reduce sample size with Matched = 25 and Mismatched = 11. There were no pretest differences and none of the analyses were significant.

Chapter 4

DISCUSSION

An evaluation of the original *Believe It!* program revealed a treatment-by-ethnicity effect (Kovalski & Horan, 1999). Specifically, the Internet program reduced irrational career beliefs and self-stereotyping among Caucasian adolescents but not among minority girls. As a result, this research study attempted to extend the program's effectiveness by manipulating the ethnic appearance of the program's animated agent. The original program included four cartoon characters designed to represent different ethnic groups (e.g., Caucasian, African American, Latina/Hispanic, and Asian). For this study, the original was modified into two versions that included a single agent designed to appear ethnically similar/dissimilar to Latina girls. This study failed to reduce Latina irrational career beliefs and did not support prior studies suggesting that ethnicity and perceived similarity of counselors/teachers/animated agents have implications for treatment/program effectiveness. Although the lack of significant results was initially disappointing and complicated by confounds, a closer look at the data provided enriching information about Latina adolescent perception of ethnicity.

It was hypothesized that matching Latina adolescent program users with animated agents designed to appear ethnically similar would lead to a reduction in reported irrational career beliefs in comparison to a mismatched control group. The study design was based on confidence that Latina adolescents who viewed the phenotypically Latina agent (i.e., Maria) would perceive her as such and hence identify her as ethnically similar. Likewise, it was expected that those that

viewed the Caucasian agent (i.e., Jessica) would stereotype her as Caucasian and identify her as dissimilar. The agents were carefully designed; however the results indicated that Latina's perception of ethnicity was not so clear-cut. While the majority of Latinas correctly identified Maria as Latina/Hispanic, almost half who viewed Jessica, the blonde haired blue-eyed agent, also identified her as Latina/Hispanic. The lack of independent variable integrity confounded the analyses by negating the defining factor upon which the two conditions were based (i.e., viewing a character of similar or dissimilar appearance). Attempts to reevaluate the data based on the participants' endorsement of agent ethnicity and perceived similarity/dissimilarity rather than solely on condition assigned resulted in a reduced sample size and disparate comparison groups. Thus, the insignificant results based on reported ethnicity and perceived similarity may have been washed out by reduced statistical power rather than the absence of a true treatment effect.

In retrospect, complications regarding perceived ethnicity should not be surprising given the diversity of Latinas/Hispanics as a group. Although stereotypical dark features may characterize Latinas/Hispanics in the local area, Latinas/Hispanics as a group include people of every race. Blonde hair and blue eyes may not characterize the majority of the Latinos/Hispanics in the local area but Latino media provide ample examples of Latinos/Hispanics with a variety of physical features. Specifically, telenovales commonly include "gueros" (i.e., fair skinned) Latino cast members of Caucasian descent who appear similar to the Caucasian agent utilized in this study.

Interestingly, the Latinas' responses to the Caucasian agent's ethnic appearance is in contrast to the responses of participants collected as part of total data collection efforts that were not included in this study (e.g., participants that did not self-identify as Latina/Hispanic). Specifically, 100% of African Americans who viewed the same Caucasian character identified her as Caucasian, which suggests that perceived ethnicity varies among ethnic groups. Historically group differences have been based on biological factors such as hair, eye, and skin color (Gossett, 1997), yet research suggests that the perception of race is changing (Penner & Sapperstein, 2008). In fact, federal standards for collecting data about ethnic/racial information require questions assessing Hispanic origin in addition to querying about race (Office of Management and Budget, 1997). Interestingly, according to Penner and Sapperstein (2008), results of the 2002 National Longitudinal Survey of Youth (NLSY) showed that a "significant" number of participants did not endorse a race after identifying themselves as Hispanic origin (p. 19630). Consistent with the results of this study, race/physical factors may be less salient for determination of within group status among Latinos/Hispanics even though these factors may still be a key factor among African Americans. Latinas/Hispanics may be more aware of the interplay of race and ethnicity as a signal of group membership due to within-group diversity.

In sum, the study failed to extend the effectiveness of the *Believe It!* program to Latina adolescents. The results were surprising given significant results of a mirror study with African Americans that was completed parallel with

this current study. However this study's results do not appear to be a true reflection of the impact of matching/similarity because of complications surrounding Latina perception of ethnicity. Despite the absence of significant results the data is still informative and suggest that in-group status among Latinas/Hispanics is not solely based on skin, hair, or eye color. Similarity may still be an influential factor for Latina's however the scope of what Latinas perceive as similar may be broader than for other ethnic groups.

Future studies should attempt to reassess the potential implications of matching (e.g., similarity) on *Believe It!* program effectiveness among Latinas with a larger sample. Furthermore, matched and mismatched groups should be carefully evaluated posteriori to data collection to ensure groups are based on the participants' specific identification of the agent's ethnicity and perceived similarity to themselves. Another consideration would be the addition of a third group that does not view the program to evaluate overall effectiveness of the modified versions of the *Believe It!* program, which included some slight script modifications. Future studies might also consider the inclusion of mismatched conditions designed to represent other ethnically different groups (e.g., an Asian or African American agent) since within-group Latina status appears to extend to the stereotypical features of Caucasians.

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APPENDIX A
CAREER BELIEFS INVENTORY

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.
- ___ 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 B
CAREER MYTHS SCALE

CAREER MYTHS SCALE

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

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

- ___ 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 C

BELIEVE IT

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.

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Uncertain</i>	<i>Agree</i>	<i>Strongly Agree</i>
1	2	3	4	5

2. There is only one career in my life that will make me happy.

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Uncertain</i>	<i>Agree</i>	<i>Strongly Agree</i>
1	2	3	4	5

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

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Uncertain</i>	<i>Agree</i>	<i>Strongly Agree</i>
1	2	3	4	5

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

<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Uncertain</i>	<i>Agree</i>	<i>Strongly Agree</i>
1	2	3	4	5

APPENDIX D
OCCUPATIONAL SEX-ROLE QUESTIONNAIRE

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 E
CHARACTER QUESTIONNAIRE

CHARACTER QUESTIONNAIRE

Please answer the following questions about the character that appeared in the computer program you just completed:

How would you classify the ethnic/racial appearance of the character in the computer program? (*Please select your answer with an X. Select just one.*)

- | | |
|--|---|
| <input type="checkbox"/> Latino/Hispanic American | <input type="checkbox"/> African American/Black |
| <input type="checkbox"/> Asian American (East Asian): | <input type="checkbox"/> Euro-American/Caucasian |
| <input type="checkbox"/> Native American | <input type="checkbox"/> Asian American (Middle East) |
| <input type="checkbox"/> Other (<i>Please specify</i>) _____ | |

How does the character's ethnic appearance compare to your own? (*Please select your answer with an X. Select just one.*)

- Same ethnicity
- Different ethnicity

APPENDIX F
DEMOGRAPHIC INFORMATION

DEMOGRAPHIC INFORMATION

Age (e.g. 11, 12, etc) _____

Date of Birth: _____

School Grade (e.g., 6th, 7th, etc.) _____

Self- Identification: (i.e., ethnicity/race)

- ___ Euro-American/Caucasian
 - ___ Latino/Hispanic American
 - ___ African American/Black
 - ___ Native American
 - ___ Asian American (East Asian)
 - ___ Asian American (Middle East)
 - ___ Biracial/Multiracial (Please specify)
-

Generation in the U.S.:(Please select your answer with an X)

- ___ First (Born outside of the U.S.; you immigrated to the U.S.)
 - ___ Second (Your parents immigrated; you were born in the U.S.)
 - ___ Third (Your grandparents immigrated; you and your parents were born in the U.S.)
 - ___ Fourth (Great-grandparents immigrated; you, your parents and grandparents were born in U.S.)
 - ___ Other generation (Please specify)
-

Are you fluent (i.e. can have a complete conversation) in a language other than English? (If you select "No" skip the last three questions)

No _____ Yes _____

If you selected Yes, what language(s) do you speak other than English? (Select all that apply)

- ___ Spanish
- ___ French
- ___ Other: (Please specify) _____

Which language do you most commonly speak with friends?

- ___ English
- ___ Spanish
- ___ French
- ___ Other: (Please specify) _____

Which language do you most commonly speak with family?

- ___ English
- ___ Spanish

____ French
____ Other: (*Please specify*) _____

Which language do you prefer to speak overall?

____ English
____ Spanish
____ French
____ Other: (*Please specify*) _____

APPENDIX G

HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL

HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL



Office of Research Integrity and Assurance

To: John Horan
EDB

P From: Mark Roosa, Chair ←
Soc Beh IRB

Date: 06/24/2010

Committee Action: Amendment to Approved Protocol

Approval Date: 06/24/2010

Review Type: Expedited F12

IRB Protocol #: 0912004613

Study Title: The Impact of Matching Animated Agent Ethnic Appearance on the Effectiveness of an Internet-Based Career Development Program

Expiration Date: 04/08/2011

The amendment to the above-referenced protocol has been APPROVED following Expedited Review by the Institutional Review Board. This approval does not replace any departmental or other approvals that may be required. It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

This approval by the Soc Beh IRB does not replace or supersede any departmental or oversight committee review that may be required by institutional policy.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

Please retain a copy of this letter with your approved protocol.

Arizona State University
Office of Research Integrity and Assurance
IRB
P.O. Box 871103
Tempe, AZ 85287-1103
Phone: 480-965-6788
Fax: (480) 965-7772




For Office Use Only:
Date Received:

ASU IRB
Signature: *SM*
Date: *6/24/10*



Modification Form Institutional Review Board (IRB)

INVESTIGATOR INFORMATION		
PROTOCOL TITLE: The Impact of Matching Animated Agent Ethnic Appearance on the Effectiveness of an Internet-Based Career Development Program	HS # 0912004613	<i>A002</i>
PRINCIPAL INVESTIGATOR: John Horan, PhD	DEPARTMENT/CENTER: Counseling Psychology/Mary Lou Fulton Institute and Graduate School of Education	
CAMPUS ADDRESS: Psychology in Education Arizona State University EDB 446L (Mail Code 0611) PO Box 870611 Tempe, AZ 85281	PHONE: (480) 965-2951 EMAIL: Horan@asu.edu	
CO-INVESTIGATORS: Amanda Hardy & Jacqueline Webster		
FUNDING STATUS: If project is funded or funding is being sought, provide list of all sponsors and grant numbers: N/A		
TYPE OF MODIFICATION (CHECK ALL THAT APPLY)		
Please attach any revised documents (forms, scripts, etc). Attach a brief summary of the proposed changes as well as a justification.		
<input type="checkbox"/>	New Procedures	Attach a description of the new procedures and a revised consent form.
<input type="checkbox"/>	Study Title Change	What is the new title?
<input type="checkbox"/>	Change in Study Personnel	<input type="checkbox"/> Add (include the name, role, and contact information. Include copies of training certificates: http://researchintegrity.asu.edu/training/humans <input type="checkbox"/> Delete
<input checked="" type="checkbox"/>	Change of Site	<input checked="" type="checkbox"/> Add (include the name and location. If this changes the enrollment, that should be noted below.)In addition to the Boys and Girls Club Ladmo Branch, Boys and Girls Club Colangelo Branch, and Washington School District, we received permission to collect data from the following: Berean Church 3102 N. 29th Avenue Phoenix, AZ 85017 (602) 253-7052 First New Life Missionary Church 1902 W. Roeser Road Phoenix, AZ 85041 602-253-6904 <input type="checkbox"/> Modify <input type="checkbox"/> Delete
<input type="checkbox"/>	Change in Enrollment This will not change the enrollment. We still intend to	Attach a narrative justifying the change. If this will affect the consent, send a revised consent form as well.

	obtain a sample of n= 150	
<input checked="" type="checkbox"/>	Consent Change	Attach a copy and describe the change(s). We have decided to use separate consent forms for students recruited from the Boys and Girls Club and those that are recruited from the Washington School District and those recruited from the churches. This decision was made based on the fact that the participants from the Washington school district will complete the program during school hours while the other participants will complete the program during free time after school and participants from the church will complete the program during church hours. We created separate parental consent forms to reflect this difference in order to best inform the parents. The assent form was not altered.
<input type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement.
<input type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials.
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR:	Name (first, middle, last): John J. Horan	
	Signature: 	Date: 6/21/10

PARENTAL LETTER OF PERMISSION
(For Church Members)

Dear Parent:

We are graduate students under the direction of Professor John Horan in the Mary Lou Fulton Institute and Graduate School of Education at Arizona State University. We are conducting a research study to evaluate a modified version of a career development program that is offered on ASU's Virtual Counseling Center. The program challenges irrational career beliefs of adolescent girls that may limit the type of career they pursue in the future.

I am inviting your child's participation, which will involve approximately 60 minutes over the course of two weeks. The study has been approved by your child's church organization. If you allow your child to participate, they will be asked to complete several brief questionnaires before and after they view a 15-minute career development program. Your child's participation will take place during church hours at a time slot selected as most appropriate by a church official. Your child's participation in this study is voluntary. If you choose not to have your child participate or would like to withdraw your child from the study at any time, there will be no penalty (i.e., it will not affect your child's grade or treatment/care in church). Likewise, if your child chooses not to participate or to withdraw from the study at any time, there will be no penalty.

Although there may be no direct benefit to your child, the possible benefit of your child's participation is that the career program may challenge irrational career beliefs your child holds that may affect how they approach/think about a future career. By challenging these harmful beliefs, there is an increased likelihood that they will eventually engage in positive career-related behaviors. There are no foreseeable risks or discomforts to your child's participation.

All information obtained in this study is strictly confidential. In order to maintain confidentiality of records, the researchers will not use names or identifying information on any forms/questionnaires/assessments, but will use numerical codes instead. All data will be stored in a location with two locks. Only investigators involved in this research will have access to the information obtained from your child. The results of this study may be used in reports, presentations, or publications but your child's name will not be used.

If you have any questions concerning the research study or your child's participation in this study, please contact Dr. John Horan at Horan@asu.edu, 480-965-2951, Amanda Hardy at ahardy@asu.edu or Jacqueline Webster at Jacqueline.Webster@asu.edu;

Sincerely,

John J. Horan, Ph.D.

Amanda Hardy, M.Ed.

Jacqueline Webster, B.S.

By signing below, you **ARE** giving consent for your child _____ (Child's name) to participate in the above study.

Signature

Printed Name

Date

If you have any questions about you or your child's rights as a subject/participant in this research, or if you feel you or your child have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the Office of Research Integrity and Assurance, at (480) 965-6788.

ASU IRB Approved	
Sign	<i>Ad for Mark P. G. S.</i>
Date	<i>6/24/10 - 4/8/11</i>

BIOGRAPHICAL SKETCH

Amanda Hardy was born on a U.S. military installation in Heidelberg, Germany and was raised in Alamosa, Colorado. She went on to graduate Magna Cum Laude with a Bachelor of Science in Psychology at Colorado State University. She began the PhD Counseling Psychology program at Arizona State University in 2005 along with five other students. She obtained a Master's in Counselor Education along the way and graduated with her PhD on 14 December 2011. She is currently serving as a Captain in the United States Air Force where she utilizes her skills to address mental health concerns of the men and women serving this country.

