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Do bilinguals have two personalities? A special case of cultural frame switching☆

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Abstract

Four studies examined and empirically documented Cultural Frame Switching (CFS; Hong, Chiu, & Kung, 1997) in the domain of personality. Specifically, we asked whether Spanish–English bilinguals show different personalities when using different languages? If so, are the two personalities consistent with cross-cultural differences in personality? To generate predictions about the specific cultural differences to expect, Study 1 documented personality differences between US and Mexican monolinguals. Studies 2–4 tested CFS in three samples of Spanish–English bilinguals, located in the US and Mexico. Findings replicated across all three studies, suggesting that language activates CFS for Extraversion, Agreeableness, and Conscientiousness. Further analyses suggested the findings were not due to anomalous items or translation effects. Results are discussed in terms of the interplay between culture and self.

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1. Introduction

"Learn a new language and get a new soul" (Czech proverb)

By some estimates, half the world's population is bilingual and many others are multilingual (Grosjean, 1982). With regard to this group, it has often been noted, sometimes by bilinguals themselves, that bilinguals express different personalities when they speak in different languages. Indeed, previous research has even provided some support for the idea that language influences bilinguals' responses to value-related surveys (e.g., Ralston, Cunniff, & Gustafson, 1995). One of the most compelling theoretical explanations for these phenomena is the *Cultural Frame Switching* effect (CFS; Hong, Chiu, & Kung, 1997; Hong, Morris, Chiu, & Benet-Martínez, 2000), where bicultural individuals shift values and attributions in the presence of culture-relevant stimuli.

Bicultural individuals are those who have two internalized cultures that can guide their feelings, thoughts, and actions (Hong et al., 2000; LaFromboise, Coleman, & Gerton, 1993). Recent research on bicultural individuals has shown that the presence of culture-specific cues can elicit culture-specific attributions and values. For instance, in one series of studies, Chinese American biculturals displayed more internal attributions when primed with American icons (e.g., American flag, Superman), and more external attributions when primed with Chinese icons (e.g., Chinese dragon, Great Wall) (Benet-Martínez, Leu, Lee, & Morris, 2002; Hong et al., 2000). Similarly, Hong Kong Chinese and Chinese Americans generated more collective self-descriptions when their Chinese identity was activated, than did North Americans. On the other hand, North Americans and Chinese Americans generated more individual self-descriptions, when their American identity was activated, than did Hong Kong Chinese (Hong, Ip, Chiu, Morris, & Menon, 2001).

Bilinguals tend to be bicultural (e.g., LaFromboise et al., 1993). So one potential explanation for the language-dependent changes observed in bilinguals' personalities is that these individuals undergo a cultural frame switch when they change from one language to another. Previous research has provided some support for the idea that language can prime bilinguals' responses to surveys (Bond & Yang, 1982; Ralston et al., 1995; Yang & Bond, 1980). In one study, Chinese bilinguals who responded to a questionnaire in English endorsed more values and norms associated with the English-speaking world than did Chinese bilinguals who responded to the same questionnaire in Chinese (Bond & Yang, 1982); however their findings were mixed and they even identified the opposite pattern in some cases. In a more recent investigation, Hong Kong bilingual-Chinese managers who responded to a values questionnaire in English displayed means closer to a group of American managers in the US than did the bilingual-Chinese managers who responded to the same questionnaire in Chinese (Ralston et al., 1995).

Such effects have been explained in terms of *cultural accommodation* (Bond & Yang, 1982), a phenomenon that is conceptually equivalent to CFS. Much like CFS, cultural accommodation is seen when bilinguals respond to situations (e.g., when completing a questionnaire) in a manner that accommodates or favors the culture associated with the language they are currently using. This is because the language itself primes the bilinguals' culture-specific values, attitudes, and memories, which in turn affect that behavior (e.g., their responses to a questionnaire). Thus, when bilinguals answer an instrument in their native language their responses will reflect the values and attitudes associated with that language. When they respond to a questionnaire in their second language, they may favor norms and values associated with that language.

Thus, research on CFS shows that bilinguals display different values and attitudes when responding to questionnaires in different languages. However, it is not clear whether CFS occurs in personality traits. For this to occur, language would have to be a sufficiently strong cue to activate a response and personality would have to be sufficiently malleable to shift in response to the cues. These considerations suggest that any changes in personality due to language could be subtle.

Ideally, a test of CFS in bilinguals would include the following three features. First, it should be established that cross-cultural differences in personality exist; if there are no differences between monolinguals in each culture, how could CFS be used to explain any observed differences when bilinguals are tested in their two languages? Second, an instrument should be used that has established cross-cultural credentials; these credentials should include not only a history of replication of effects across cultures, but also a way of determining that mean levels are not due to differential functioning of the questionnaire items across cultures. Third, given the potential subtlety of the frame switching effects and the possibility that any effects reflect local or transitory influences (rather than robust, cross-cultural influences), replication across populations should be sought. We next review the past research and evaluate it with respect to these three features.

1.1. Past research on cross-language personality differences using bilinguals

Despite the widespread belief that one's language influences one's personality, very few studies have looked at the effects of language usage on personality. McCrae, Yik, Trapnell, Bond, and Paulhus (1998) did report language-related differences in personality in a large sample of bilingual Hong Kong undergraduates; however, these differences were attributed to a measurement artifact.

But other studies report personality differences in bilinguals and do explain the findings as a function of cultural shifts. For example, Ervin (1964) examined whether French–English bilinguals would show different personalities when responding to the Thematic Apperception Test (TAT) in English versus French. A few intriguing findings emerged, showing glimpses of support for a CFS phenomenon. For example, one finding suggested that women participants, but not men, used more achievement themes in English than in French. Ervin inferred that women used more achievements themes in English because American culture is less concerned with social roles

than is French culture (e.g., the role of housewife is more part of the French culture than the American culture). Ervin also found more verbal aggression toward peers in French stories than in English stories. She suggested that this was due to the fact that French education emphasizes the use of oral argument in defense of insults from others. Finally, she found that themes of autonomy were more common in French stories than in English stories. She speculated that this was because French, but not American, families tend to withdraw after disagreement.

Ervin's (1964) findings provide some support for the CFS hypothesis, but they are far from conclusive. Moreover, they are subjected to three limitations. First, no comparative evidence was given regarding the kind of stories French-speaking people living in France and English-speaking people living in the US typically provide. Second, the cross-cultural generalizability of the TAT was not established. Third, no evidence was provided for the replicability of the effects in different populations.

More evidence that language is related to personality was provided by a study using the California Psychological Inventory (CPI) in Spanish–English bilinguals (Hull, 1996). The results showed some support for the CFS effect. For example, bilinguals' scores in the *Good Impression* factor were higher in Spanish than in English. Hull (1996) conjectured that bilinguals showed this tendency because in the Spanish-speaking culture, like in other collectivist cultures, there is greater concern about interpersonal harmony and pleasing others (Marín & Marín, 1991), and also because group affiliation is valued more strongly (Shkodriani & Gibbons, 1995). In addition, bilinguals showed more *Intellectual Efficiency* when responding in English rather than in Spanish. Hull argues that this finding results from the widespread belief that the American–English culture, at the pinnacle of individualistic culture, emphasizes more achievement aspirations than does Spanish-speaking culture (Díaz-Guerrero & Szalay, 1991; Madsen & Kagan, 1973).

Although Hull's study (1996) also provides some support for CFS, it too suffers from a number of limitations. First, as Hull himself points out, the CPI has been criticized as lacking a factorial foundation (see Domino, 1985; Eysenk, 1985; Goldberg, 1972). And, as in Ervin's study, no clear comparative evidence is provided regarding CPI differences between monolinguals who speak either English or Spanish. Finally, as in Ervin's study, the findings have not been replicated in multiple samples.

1.2. The present research

The main goal of this research was to establish and empirically document the CFS effect in the personality domain. We chose to study this phenomenon with Spanish–English bilinguals because there is a widespread belief that Spanish speakers have very different values and attitudes from English-speakers (Benet-Martínez & John, 2000; Díaz-Guerrero & Szalay, 1991; Hofstede, 1980; Marín & Marín, 1991). In addition, there exists a personality questionnaire that has been extensively examined and validated in both Spanish and English. Building on the important earlier work of Ervin (1964) and Hull (1996), we tested whether Spanish–English bilinguals display different personalities in Spanish and English in ways that reflect the personality tendencies

associated with each language–culture. Furthermore, we evaluated the robustness of the effects by searching replication across samples in Mexico and the US.

We started by generating predictions for the specific cultural differences to expect by examining personality differences between English and Spanish-speaking cultures (operationalized in this research as individuals living the US or Mexico, respectively). English-speaking Americans and Spanish-speaking Mexicans were the most appropriate comparison group because the majority of bilinguals to which we have access have a cultural background both from Mexico and the US. Specifically, most of the bilinguals in our samples were either immigrants from Mexico now living in the US, Mexican residents who learned English in the US, or second generation Mexican Americans (i.e., US-born individuals whose parents are from Mexico).

As noted above, we tested the robustness of the CFS effects by seeking replication across samples. In particular we used within-subjects designs in three samples of Spanish–English bilinguals who completed both the Spanish and English version of a personality questionnaire. It is important to note that we relied only on bilinguals who met very high standards of bilingual proficiency. The advantage of using high standards is that participants are very confident using both languages and can reasonably be assumed to adopt either language and, if the CFS effect holds, activate the relevant cognitive and affective associations (Hong et al., 2000). Had we used lower standards of bilingual proficiency, then a failure to find a language effect would be inconclusive. The disadvantage of using very high standards of bilingual proficiency is that large samples of true bilinguals are difficult to find. Thus, with small samples, we judge the robustness of the effects by their replicability across independent samples rather than by their statistical significance (Thompson, 1994, 1999; Wilkinson & the task force on statistical inference, 1999).

1.3. Measurement of personality

Which elements of personality should be examined? Given the scarcity of previous cross-cultural research using the same questionnaire in Spanish-speaking cultures vs. English-speaking cultures it is important to examine a broad array of traits. Moreover, the instrument assessing those traits should be well established and should exist in multiple languages. The broadest and most widely used model of personality traits is provided by the Big-Five framework. In this framework, each bipolar factor (e.g., Extraversion vs. Introversion) summarizes several more specific facets (e.g., Sociability), which in turn, subsume a large number of even more specific traits (e.g., talkative, outgoing). Several instruments have been developed to assess the Big Five dimensions. Which of these is most appropriate for the current research? One scale stands out as being particularly well suited for our purposes: the Big Five Inventory (BFI). This instrument has enjoyed wide use in the field due to its efficiency, brevity, and good psychometric properties (John, 1990; John & Srivastava, 1999). More important, the instrument has been carefully translated to Spanish and rigorous tests have shown it to have good psychometric properties in English and Spanish-speaking samples (Benet-Martínez & John, 1998; Rodríguez & Church, 2003). Two studies by

Benet-Martínez and John (1998) supported the generalizability of the instrument across student and working-class populations. Therefore, the BFI was adopted for the present research.

Both the English and Spanish BFI have 44 items with a 5-point Likert scale, that ranges from 1 (*disagree strongly*) to 5 (*agree strongly*). The five dimensions that the questionnaire measures are: Extraversion (8 items), Agreeableness (9 items), Conscientiousness (9 items), Neuroticism (8 items), and Openness (10 items).

1.4. Overview of research

In four studies we tested the CFS effect. In Study 1, with a sample of English speakers and Spanish speakers we derived predictions for the particular personality differences to expect. In Studies 2–4, we examined the replicability of the CFS phenomenon in three different samples of bilinguals.

2. Study 1: Deriving predictions for expected personality differences

What specific personality differences should be expected across English and Spanish-speaking cultures? Previous research has reported some personality differences between individuals living in American and Mexican cultures. For example, Díaz-Guerrero (1982) found that Mexicans show an avoidant personality under stressful situations, whereas individuals from the US seek to confront them. Other research on responses to stressful situations has shown that Mexican culture values a response characterized as being peaceful, serene, calm, and tranquil, whereas US culture values a response characterized as being active, resourceful, energetic, and effective (Díaz-Loving & Draguns, 1999; LaRosa & Díaz-Loving, 1991).

Other traits that have been associated with the Mexican culture include abnegation and nonassertiveness (Díaz-Guerrero, Díaz-Loving, & Rodríguez de Díaz, 2001) and "*simpatía*" (Triandis, Marín, Lisansky, & Betancourt, 1984). The first two traits refer to a behavioral disposition to put others' needs before one's own needs. *Simpatía* is a construct characterizing individuals who value positive behavior, are agreeable, and avoid interpersonal conflict and negative behaviors. Díaz-Loving and Draguns (1999) described *simpatía* as being manifested in Mexican culture in terms of individuals who value "expressive sociability, positive mood states, affectionate social interactions, and reflective, serene, calm, and tranquil attitudes" (p. 121).

These studies did not assess Big Five traits directly and although they offer some clues as to the kind of cross-cultural differences we might expect to find in terms of the Big Five, clear predictions are hard to make. For example, Mexicans' high sociability (associated with *simpatía*) suggests Mexicans should be higher than Americans on Extraversion but at the same time the Mexican dispositions of low assertiveness and abnegation suggest Mexicans should be lower than Americans on Extraversion. Moreover, many of the past studies draw conclusions about cross-cultural differences based on studies done within each culture independently, often using different

questionnaires in the different cultures and assessing constructs that are difficult to place in a Big-Five framework. Thus, although the cross-cultural research consistently suggests that Mexicans and Americans differ in their personalities, the past studies do not provide sufficient evidence to make firm predictions about specific cross-cultural personality differences in terms of the Big Five.

Therefore, the broad aim of Study 1 was to provide an empirical basis for making predictions about the personalities associated with English and Spanish-speaking cultures. Specifically, our goal was to examine directly real personality differences between the two cultures in terms of the Big-Five framework. To accomplish this goal we needed a large and diverse sample of individuals living in the US and living in Mexico. This led us to use a medium of data collection that permits access to large numbers of willing participants all over the world: the Internet. Data collection through the World Wide Web has increased in popularity over recent years because it permits access to samples (in this case Spanish-speakers living in Mexico) beyond the reach of methods typically used in psychological research, and because it affords access to large heterogeneous samples (Gosling, Vazire, Srivastava, & John, 2004). Although one should be cautious about new methods, research on the quality of internet data suggests that it is at least as good as that provided by traditional paper-and-pencil methods (Gosling et al., 2004). In addition, although Internet users are not representative of the general population, they are at least as diverse as other samples typically used in psychological research (Gosling et al., 2004).

2.1. Method

2.1.1. Participants

Participants were part of the data collected by means of the Gosling–Potter Internet Personality Project, which recruits volunteer participants all over the world through the Internet. Only those participants who indicated that they lived in Mexico or the US and whose ages ranged from 18 to 65 years were selected to participate, and we analyzed only those participants who indicated they had not taken the questionnaire before. The final sample of individuals living in the US who responded to the BFI in English was 168,451 (44% men and 55% women). Their mean age was 27.8 ($SD = 9.3$). Their self-reported social class was 2% upper, 28% upper-middle, 46% middle, 16% working, and 8% lower-middle class. The sample of individuals living in Mexico who responded to the BFI in Spanish was 1031 (34% men and 65% women). Their mean age was 24.84 ($SD = 7.22$). Their self-reported social class was 2% upper, 15% upper-middle, 37% middle, 8% working, and 9% lower-middle class.

2.1.2. Procedure

Participants were recruited by means of a web site www.outofservice.com that contains the BFI in both English and Spanish, as well as games, quizzes, and other personality questionnaires (see Srivastava, John, Gosling, & Potter, 2003). Potential participants can access the web site through several channels: it can be found with major search engines under key words such as *personality tests*; it is listed on portal

sites, such as Yahoo!, under their directories of personality tests; and individuals who have previously visited outofservice.com and signed up for its mailing list receive notification when a new questionnaire is added. As is common on the Internet, news of the site has also spread widely through informal channels such as emails or unsolicited links on other Web sites.

The data collection and scoring is automated, providing participants with immediate feedback about their personalities, appealing to their motivation to receive individualized personality feedback for the purposes of self-insight or entertainment. Two web pages were used. The one in English was entitled "All About You—A Guide to Your Personality" and the one in Spanish was entitled "Como Eres Tú—Una Guía de Tú Personalidad." Both web pages had the same physical appearance, the same instructions, and questions; the only difference was the language. Each time a participant clicked on the "submit" bottom, their Big Five personality scores were computed and provided as feedback. Their specific scores were recorded and saved to a data base.

2.2. Results and discussion

To determine whether different personality profiles were associated with the two cultures, participants' scores were aggregated within each of our two groups (English-speakers in the US and Spanish-speakers in Mexico) and were analyzed using independent *t* tests to identify personality differences. Of course, with a sample so large (i.e., 168,451 in the US and 1031 in Mexico), all differences were statistically significant and we instead focus on the direction of the effects. Table 1 shows the means and standard deviations for each of the five factors. Results showed that the participants in the US had higher means in Extraversion, Agreeableness, Conscientiousness, and Openness than participants in Mexico. For the Neuroticism factor, people in Mexico scored higher than people in the US.

The findings from this study point to a modest personality differences between English-speaking Americans and Spanish-speaking Mexicans. These results suggest a specific set of predictions for the CFS phenomenon. In particular, we would expect the language of the questionnaire to prime in our bilingual participants' culture-specific values, attitudes, and memories (Hong et al., 2000). In turn these values, attitudes, and memories would affect participants' responses to the questionnaires, such

Table 1
Big Five personality scores of English-speakers in the US and Spanish-speakers in Mexico

Factor	United Sates (English)		Mexico (Spanish)	
	Mean	*SD*	Mean	*SD*
Extraversion	3.18	.91	3.10	.85
Agreeableness	3.64	.73	3.34	.67
Conscientiousness	3.50	.74	3.41	.71
Neuroticism	3.04	.88	3.28	.84
Openness	3.98	.66	3.85	.67

Note. All differences are statistically significant, $p < .001$. Sample sizes for the US = 168,451; for Mexico = 1031.

that bilinguals will have higher mean scores in Extraversion, Agreeableness, Conscientiousness, and Openness, and lower scores in Neuroticism when responding in English compared to Spanish.

3. Studies 2–4: Testing the cultural frame switching effect in three independent samples of bilinguals

The purpose of these additional studies was to test whether bilinguals switch their personality when they switch the language they are using when they respond to a questionnaire. As noted above we are primarily interested in effects that replicate across independent samples of bilinguals. Thus, we will first present the methods used in each of the three studies and then we will present the findings from all three studies together. Note, our predictions focus on cross-language *differences*, and given the variations in methods, administration procedures, and targets, we make no predictions about mean scores on the personality dimensions.

3.1. Study 2: Bilinguals from Austin, Texas

In this study bilinguals were asked to come to the lab on two occasions. In each meeting they completed a paper and pencil version of the BFI either in Spanish or in English. The meetings were conducted at least one week apart, and the order of language was counterbalanced across participants. As noted above, we opted to use rigorous labor-intensive tests of bilingualism, with the consequence that the sample was somewhat smaller than it would have been had we used lower bilingualism standards.

3.1.1. Participants

A total of 25 Spanish–English bilinguals (10 men and 15 women) living in Austin, Texas, participated. Their mean age was 25 ($SD = 4.65$). Participants were recruited by means of flyers. Part of the sample was paid for their participation ($n = 23$). Others received course credit ($n = 2$).

3.1.2. Measurement of bilingualism

Two interviews were conducted to ensure the participants met our criteria for bilingualism. First, a bilingual experimenter interviewed the potential participants by phone in both English and Spanish and judged whether the participants were confidently using both languages. Second, a face-to-face interview was conducted prior to the experiment in both English and Spanish where the researcher asked general background questions to the participants and judged how confident the bilinguals used each language. After the second interview, two bilinguals decided not to participate further in the study. Finally, a third measurement of bilingualism proficiency was taken using self-reports of proficiency and experience in both languages. This questionnaire revealed that one participant's first language was not English or Spanish, but Portuguese; this participant was removed from the analyses.

3.1.3. Procedure

Bilinguals were asked to come to the lab on two occasions. In the first meeting bilinguals were interviewed by the experimenter (as part of the bilingualism screening) and they completed a background questionnaire and the BFI in either English or Spanish. The second meeting, which was scheduled at least one week later, involved completing the BFI in whichever language they had not used in the first session (English or Spanish). At end of the second meeting, participants were debriefed and paid $20 for their participation (with the exception of two participants who took the study for class credit).

3.2. Study 3: Bilinguals from the US and Mexico

This study examined personality differences across languages in Spanish–English bilinguals. The study differed from Study 2 in that bilinguals responded to the BFI by telephone rather than using the traditional paper and pencil format. By using this technique, we were able to reach participants from a wider age range than those assessed in Study 2. Moreover, this method allowed us to interview bilinguals from all over the US and in Mexico, further testing the generalizability of the effects.

3.2.1. Participants

Because true bilinguals are exceedingly hard to identify and recruit, the study adopted a targeted strategy, using nominations from colleagues and research assistants who knew bilinguals in the US or Mexico. Telephone numbers of 70 potential participants were collected. Of these, we were able to reach 54 participants (24 men and 30 women) living in the US ($n = 32$) or Mexico ($n = 22$). Their mean age was 33.6 ($SD = 12.29$).

3.2.2. Measurement of bilingualism

To measure language ability, bilinguals were asked to rate separately their confidence in using English and Spanish when writing, speaking, reading, and listening, using a scale ranging from 1 (very bad) to 10 (excellent). If participants gave a score of less than eight in any category, they were excluded from subsequent analyses. A total of 21 subjects were excluded. Furthermore, three additional bilinguals were excluded because their first language was not English or Spanish. After removing 24 participants we were left with two small samples ($n = 11$ in the US; $n = 19$ in Mexico) so we combined them into a single sample ($n = 30$) to test our main hypothesis. The final sample consisted of 15 men and 15 women and had a mean age of 34.20 ($SD = 13.02$). The mean language-confidence scores (averaged across writing, speaking, reading, and listening comprehension) were 9.04 ($SD = .64$) for English, and 9.8 ($SD = .32$) for Spanish.

3.2.3. Procedure

Bilinguals were interviewed on the phone twice, once in English and once in Spanish. Phone calls were conducted at least one week apart. In the first phone call, bilinguals provided answers to a background questionnaire and responded to oral

presentations of the BFI items. In the second phone call, individuals provided answers only to the other-language version of the BFI. The order of the language in which the interviews were conducted was counterbalanced across participants. At the end of the second phone call, the purpose of the study was revealed to the participants.

3.3. Study 4: Bilinguals from the San Francisco bay area, California

Studies 2 and 3 had two important limitations: the sample sizes were very small and the measurement of bilingualism was largely based on self-reports. In Study 4, we addressed these limitations by recruiting a larger sample and taking several steps to ensure true bilingualism. However, gathering a larger sample required that we incur the cost of having participants answer the two versions of the BFI in the same session.

3.3.1. Participants

This study is based on a re-analysis of participants originally assessed as Study 2 of Benet-Martínez and John's (1998) research on the structure of the English and Spanish versions of the BFI. A total of 170 bilinguals (66 men and 104 women) living in the San Francisco Bay Area participated. Their mean age was 25 ($SD = 10$). Students were contacted after they indicated being Spanish–English bilingual in a pretesting form in "Introduction to Psychology" courses. In addition, community residents were recruited by flyers or mail. Part of the sample received course credit for their participation ($n = 143$) and others volunteered to take part ($n = 27$).

3.3.2. Measurement of bilingualism

Students were reached by telephone and asked a series of questions in both Spanish and English to corroborate their bilingualism status. Students who did not demonstrate a minimum level of bilingual competency in this interview were excluded from the study. In the lab, both students and community residents were asked to translate two short paragraphs (one in English and one in Spanish) into the other language. Individuals who reported not being able to translate the paragraphs were excluded from the study. A bilingual judge scored the translated paragraphs, deducting points for each mistake. In addition, to check for inter-judge reliability, another judge scored 10 randomly chosen translations. The results showed strong agreement between the judges (with an inter-judge correlation of .94 for English and .97 for Spanish). On average participants got 83–91% correct on both translation tests, so no further participants were excluded.

3.3.3. Procedure

Bilinguals in a single session translated the test paragraphs, answered some background questions, and completed the BFI in English and Spanish. The order of the language in which the BFI was provided was counterbalanced. To reduce memory effects across the two presentations of the BFI, bilinguals engaged in a 5-min filler task between answering the BFI in one language and the other.

3.4. Results for studies 2–4

3.4.1. Preliminary analyses

Preliminary analyses were done to determine psychometric equivalence of the English and Spanish versions of the BFI. These analyses were conducted by correlating the means of the English and Spanish BFI on each of the factors. The resulting cross-language test–retest correlations were strong, ranging from .68 (corresponding to Extraversion in Study 3) to .93 (corresponding to Extraversion in Study 4). The mean test–retest correlation across dimensions and studies was .80 ($p < .001$). These results are comparable, to the test–retest correlations reported for the BFI in one language (Table 3, Gosling, Rentfrow, & Swann, 2003).

3.4.2. Personality differences across languages

Recall that the purpose of this investigation was to test for robust and replicable support for the CFS effect. This can be broken into two questions. Do we find the same pattern of differences across bilingual samples (Studies 2–4)? Is that pattern consistent with personality differences obtained in the cross-cultural sample (Study1)? We tested these questions by conducting five meta-analyses to evaluate the effect sizes of any cross-language differences, and the replicability of the findings across the bilingual samples.[1]

3.4.3. Extraversion

Fig. 1 presents the results of all three studies along with Sample 1 for comparison purposes. The pattern of findings is quite clear. In all three bilingual samples, Extraversion scores are higher in English than in Spanish. Furthermore, the cross-language discrepancies are consistent with the discrepancies found in the cross-cultural sample (Study 1), where English-speakers in the US scored higher than Spanish-speakers in Mexico. To estimate the effect size of the differences in the bilingual samples a d (which is an unbiased estimator of the population effect size) was derived by computing the difference between the means across languages (i.e., English vs. Spanish) and dividing it by the standard deviation of the differences between paired correlations (see Johnson & Eagly, 2000). The effect size was .25 ($p < .05$).

3.4.4. Agreeableness

Fig. 2 presents the results of all three studies along with Sample 1 for comparison purposes. Again the pattern of findings is clear. In all three bilingual samples, Agree-

[1] Note that the means of the monolingual samples in Study 1 are slightly smaller than the means of the bilingual samples (Studies 2–4). Follow-up analyses in other monolingual samples from Mexico ($n = 53$) and the US ($n = 53$) suggested that these mean differences could be attributed to a "web effect." In particular, most of the means of monolinguals who responded to the BFI on paper and pencil were very similar to the means in the three bilingual samples. Moreover, and reassuringly, the non-web monolingual samples demonstrated the same pattern of cross-cultural personality *differences* as those found in the web sample of monolinguals (i.e., Study 1).

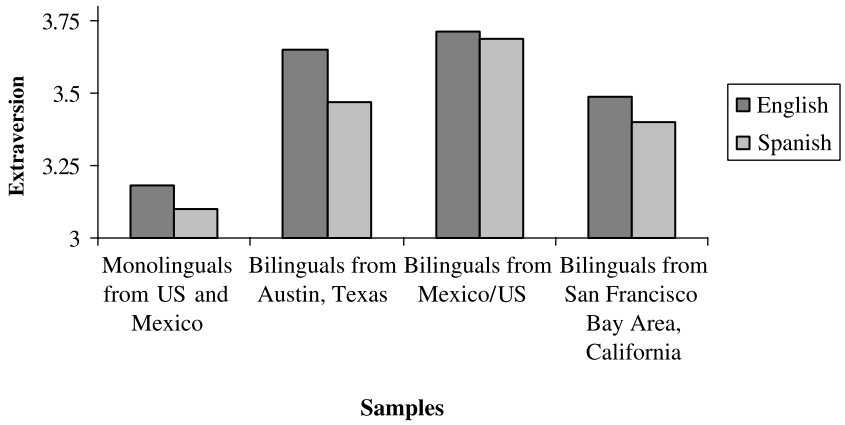

Fig. 1. Mean Extraversion scores in English and Spanish.

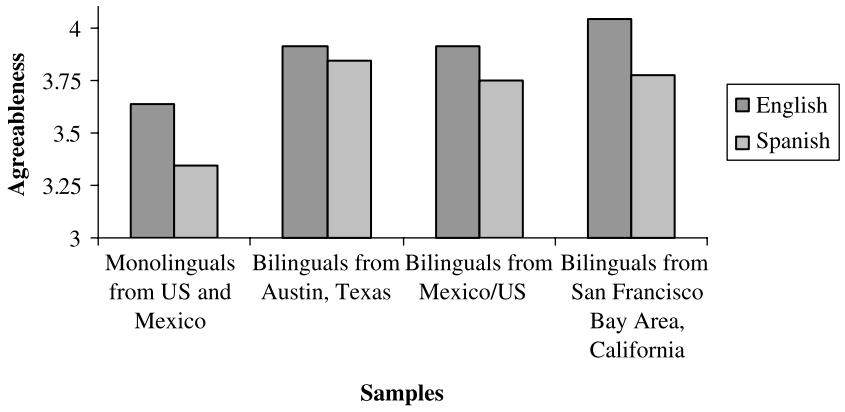

Fig. 2. Mean Agreeableness scores in English and Spanish.

ableness scores are higher in English than in Spanish. Furthermore, the cross-language discrepancies are consistent with the discrepancies found in the cross-cultural sample (Study1), where English-speakers in the US scored higher than Spanish-speakers in Mexico. The effect size was .44 ($p < .001$).

3.4.5. Conscientiousness

Fig. 3 presents the results of all three studies along with Sample 1 for comparison purposes. Again the pattern of findings is clear. In all three bilingual samples, Conscientiousness scores are higher in English than in Spanish. Furthermore, the cross-language discrepancies are consistent with the discrepancies found in the cross-cultural sample (Study 1), where English-speakers in the US scored higher than Spanish-speakers in Mexico. The effect size was .51 ($p < .001$).

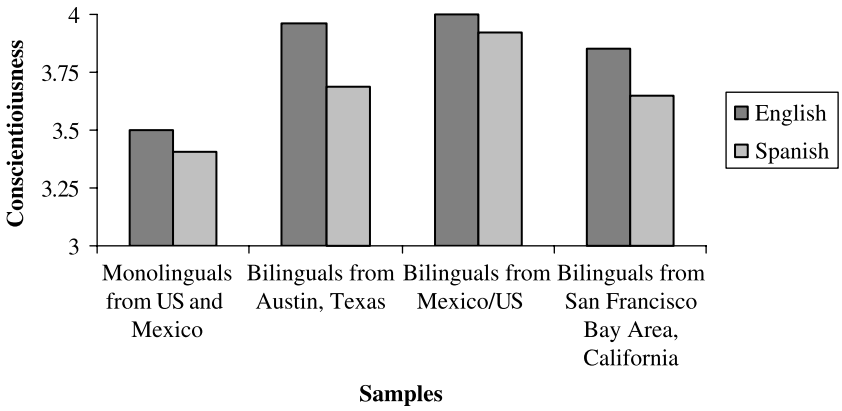

Fig. 3. Mean Conscientiousness scores in English and Spanish.

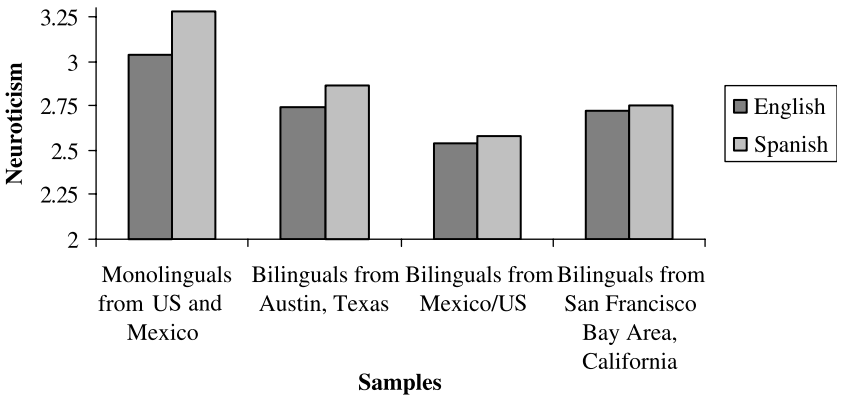

Fig. 4. Mean Neuroticism scores in English and Spanish.

3.4.6. Neuroticism

Fig. 4 presents the results of all three studies along with Sample 1 for comparison purposes. The pattern of findings is again consistent. In all three bilingual samples, Neuroticism scores are lower in English than in Spanish. Furthermore, the cross-language discrepancies are consistent with the discrepancies found in the cross-cultural sample, where English-speakers in the US scored lower than Spanish-speakers in Mexico. The effect size was −0.13 (*ns*).

3.4.7. Openness

Fig. 5 presents the results of all three studies along with Sample 1 for comparison purposes. The findings reveal that although the differences were in the same direction for all samples of bilinguals, the results were not consistent with those found in the cross-cultural study of monolinguals. Moreover, the effect size of the difference was small ($d = -0.19$, *ns*).

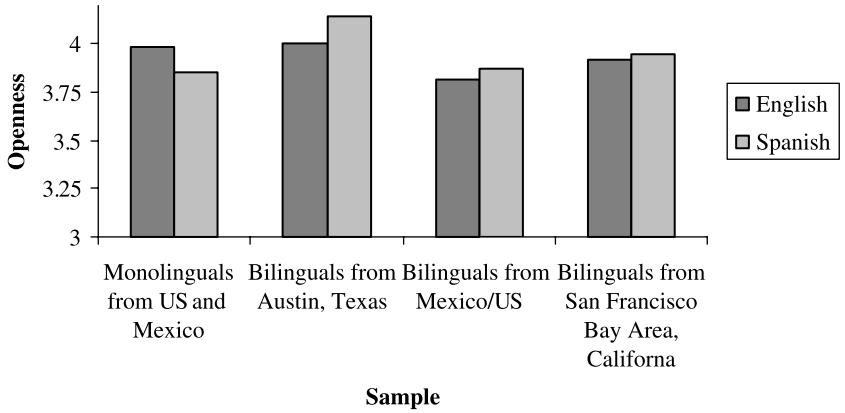

Fig. 5. Mean Openness scores in English and Spanish.

4. Follow-up analyses of bilingual data

Before speculating on the possible meaning of these results, it is important to address one potential alternative explanation for our bilingual findings. Specifically, it is crucial to address the possibility that the differences in scores between the bilinguals' scores on the English and Spanish version of the BFI are due to differences in the translations, rather than differences in the actual "personalities" of the participants (McCrae et al., 1998). Fortunately, the analytical tools needed to address this question are well developed and widely used in cross-cultural studies (Van de Vijver & Leung, 1997b).

Item-bias analyses work by testing whether individual items function differently across contexts, in this case, across languages. Essentially, these item-bias or differential-item functioning techniques test whether there are biased items within an instrument and can detect anomalies in instruments at the item level caused by poor translation (Van de Vijver & Leung, 1997a, 1997b). In this investigation we used the analysis of variance method, which is one of the first techniques that has been applied to study item bias (Clearly & Hilton, 1968). This technique analyzes each item across score levels, and requires medium-sized samples (see, Clauser, Mazor, & Hambleton, 1994). The only bilingual sample sufficiently large to run the analyses is that from Study 4, which used exactly the same instrument as that used in the other studies.

Following the steps proposed by Van de Vijver and Leung (1997a, 1997b), we used the analysis of variance technique to test each of the BFI factors. The first step was to divide the responses into two groups corresponding to the two languages in which the questionnaire was administered. Next, we derived interval variables by dividing the number of subjects into score level groups. For example, Extraversion has 8 items with a Likert scale that goes from 1 to 5 so the total score for any subject can vary from 8 to 40; to conduct a score-level analysis,

participants are grouped together according to their extraversion score. To allow us to approximate the recommended number of subjects in each interval (i.e., around 50; Van de Vijver & Leung, 1997a, 1997b), we formed 6 levels. The two groups (corresponding to the language in which the instrument was administered) and the interval levels are treated as independent variables in the analyses of variance. Each of the items within each factor are treated as the dependent variables. Thus, to summarize the analyses, we performed 2×6 analyses of variance for each item of the BFI.

Three effects are tested in the analyses of variance. The first is the effect of score level, which shows whether there are significant differences in average scores across intervals. This F ratio is usually expected to be significant because it is reflecting the fact that people in lower score levels have lower scores, whereas people at higher score levels have higher scores. The remaining two effects are the ones that should be scrutinized for possible item bias. An item is shown to be unbiased when both the main effect for language and the language $\times$ level interaction are nonsignificant. A significant main effect indicates the existence of a uniform bias (Mellenbergh, 1982). This means that the curve of differences of means between the groups is consistently above or below zero. For example, if we find a significant main effect for the item "has an assertive personality," it means that bilinguals when answering the questionnaire in English have consistently higher means across the score levels than when answering the questionnaire in Spanish. Finally, a significant interaction indicates the existence of a nonuniform bias (Mellenbergh, 1982). This means that the differences of means between English and Spanish vary across score levels. In other words, the item is anomalous because it is discriminating differently across score levels. A nonuniform bias would indicate that the item is understood differently in the different languages.

Although power was less than optimal (see, McClelland & Judd, 1993), the item-bias analyses indicated that only one of the 44 items functioned differently across translations. The anomalous item was "has an active imagination"/"tiene una imaginación activa" from the Openness scale. This item should be revised before it is used in future cross-cultural research. The fact that we did not find any other biased items hints that the items were invariant across score levels (Mellenbergh, 1982). In other words, the items were not anomalous nor were they understood differently by the bilinguals across languages. This suggests that the cross-language differences cannot be attributed to translation differences in the instrument and lends support to the CFS interpretation.[2]

[2] Although originally developed in English, the Spanish version of the BFI underwent rigorous construction procedures including the use of back translations (Benet-Martínez & John, 1998). These procedures, plus the results reported in this investigation for the item-bias analyses, indicate that the differences found across languages are not the result of an anomalous question or two within each of the factors. Indeed, if we consider the mean for each item across score levels, we found that of the 26 items comprising Extraversion, Agreeableness, and Conscientiousness, 19 (or 73%) were in the English > Spanish direction. Many of these effects are impressive in their simplicity. The reverse-scored extraversion "is reserved" is virtually identical to the Spanish "es reservado." Nevertheless, those completing the scale in English are lower ($p = .07$) across score levels than when completing the scale in Spanish.

5. Discussion

The main goal of this investigation was to examine whether the CFS effect among bilinguals can also be found for personality. Specifically, we tested whether bilinguals show different personalities in English and in Spanish and whether these differences are consistent with differences between English and Spanish-speaking cultures. We assessed the robustness of the effects by seeking replication across studies. We found that bilinguals were more extraverted, agreeable, and conscientious in English than in Spanish and these differences were consistent with the personality displayed in each culture. The cross-language personality differences for Neuroticism were relatively small and the differences for Openness were not consistent with the cross-cultural differences identified in Study 1.

Do the personality shifts documented here undermine the very concept of personality, which is meant to persist across time and situations? The correlations between the Spanish and English versions of the questionnaire are very strong (mean $r = .80$, also see Benet-Martínez & John, 1998). This suggests that individuals tend to retain their rank ordering within a group but the group as a whole shifts. Thus, an extrovert does not suddenly become an introvert as she switches languages; instead a bilingual becomes more extraverted when she speaks English rather than Spanish but retains her rank ordering within each of the groups. This phenomenon is similar to the pattern of age changes described by Caspi and Roberts (1999), where personality can simultaneously show continuity and change; an example would be a person who becomes more conscientious as he ages but retains his rank in the group because most people become more conscientious as they age (Srivastava et al., 2003).

We have interpreted the findings in terms of CFS. However, an alternative explanation would be that language use was confounded with developmental changes; for example, perhaps some of the bilinguals spent some significant part of their early lives in Spanish-speaking environments and then, later, became bilingual through the learning of English. If this were true, the fact that a participant has one personality in one language and another personality in the other language would not so much be a function of culture as it would be a function of age-related personality differences (Srivastava et al., 2003); in other words, their responses in Spanish would reflect their childhood personality and their responses in English would reflect their adult personality. Three facts, argue against this interpretation. First, this explanation would not explain why the shifts are in the direction of cultural prototypes. Second, this explanation would predict that the culture-related personality shifts should be consistent with age-related shifts for all traits, not just some of them; however, the language-dependent personality shifts documented here are consistent with the age-related shifts in for just of the some personality traits and not others. Third, as noted above, the participants underwent stringent tests for bilingualism, ensuring that both languages were still actively used. In Studies 2 and 4 we specifically asked participants to indicate the percentage of time they were currently using Spanish and English; on average participants used Spanish in 34% ($SD = 24\%$) and 32% ($SD = 19\%$) of their daily interactions for Studies 2 and 4, respectively. These findings indicate that although participants were actively involved in an English-speaking country they

also maintained contact with their Spanish-language, thereby arguing against the possibility that language use was confounded with developmental stage.

The finding (from Study 1) that Americans are higher than Mexicans in Extraversion and Agreeableness—and that similar cross-language differences are found in Spanish–English bilinguals (from Studies 2 to 4) may seem to be inconsistent with cultural concepts such as *simpatía* (e.g., value for smooth and pleasant relationships, expressing positive emotions, Triandis et al., 1984) and collectivism (e.g., group oriented, emphasis in harmonious interpersonal relationships, conformity, Markus & Kitayama, 1991), which are supposed to be higher in collectivist cultures such as Mexico. For example, research has shown that Mexican Americans value "simpatía" more strongly than Anglo-Americans do (Marín & Marín, 1991). Furthermore, Mexican Americans tend to be more collectivist than European Americans (Freeberg & Stein, 1996). Why then do Americans and bilinguals using English score higher in Extraversion, Agreeableness, and Conscientiousness than Mexicans and bilinguals using Spanish? Two possible mechanisms shed light on this enigma.

First, the apparently surprising findings become less surprising when one examines the specific facets that comprise the broad five factors. Specifically, the observed differences might be driven by unusually high scores on specific facets such as assertiveness (Extraversion), achievement (Conscientiousness), and 'superficial' friendliness (Agreeableness), traits that are related to individualist cultures, where independents selves are promoted. Markus and Kitayama (1991) describe the independent self as emphasizing directness in communication, being unique and expressing the self, all of which are related to the assertiveness found in Extraversion. The independent self also enjoys making reference to its own abilities, attributes, and goals, all of which would be manifested in terms of high scores on the achievement facet of conscientiousness. According to Markus and Kitayama, the independent selves also regulate their behavior when interacting with others, driving agreeable scores higher. In short, the combination of being extraverted, agreeable, and conscientious could underlie the expression of an independent self, which characterizes American culture (Markus & Kitayama, 1991). Along these lines, it is worth noting that Extraversion has variously been labeled Dominant-Initiative; Social Activity; Outgoing, Social Leadership; Agentive; and Dominance (see, John & Srivastava, 1999). These labels better convey the fact that, despite the folk understanding of its common label, Extraversion reflects assertiveness (a value emphasized in individualist cultures such as the US) rather than emotional expressiveness (value emphasized in collective cultures, such as Mexico). Unfortunately, the BFI does not include Big Five facet scales so it was not possible to test this explanation empirically in the present samples.

The second potential explanation for the pattern of findings is that the relatively high Extraversion, Agreeableness, and Conscientiousness scores in Americans and English-speaking bilinguals were driven by self-enhancement tendencies. There are two potential paths leading to self-enhancement in these samples, one direct and the other indirect. The direct path to self-enhancement has been well documented in European Americans (Heine, Lehman, Markus, & Kitayama, 1999; Robins & John,

1997) and is more frequent in individualistic cultures than in collectivist cultures (Heine & Lehman, 1997). Markus and Kitayama (1991) suggested that in collectivist societies, where an interdependent self is promoted, there is less need for positive self-evaluation, and less value placed on personal attributes. Accordingly, the CFS phenomenon in bilinguals could be triggered by an interplay of a self-enhancing personality (characteristic of individualistic American, English-speaking culture) with a self-effacing personality (characteristic of collectivist Mexican, Spanish-speaking culture).

The indirect path to self-enhancement is based on the finding that agreeable people tend to provide positively biased self-views (Grimm & Church, 1999); that is, Agreeableness correlates positively with the use of self-enhancement tendencies (Paulhus & John, 1998). As noted above, when primed by the English language, participants become more agreeable; one of the effects of becoming more agreeable could be to provide positively enhanced self-views. Both the direct and the indirect paths to self-enhancement would lead to Americans and bilinguals using English to have more evaluative positive self-views than those held by Mexicans and bilinguals using Spanish. However, our findings showed only mixed evidence for self-enhancement in Americans and bilinguals speaking English; this group did indeed have higher scores on Extraversion, Agreeableness, and Conscientiousness, but the self-enhancement effects for Openness and Neuroticism were mixed and weak. A self-enhancement interpretation would have to explain why participants should enhance on some evaluative traits but not others. Without such an explanation, the current findings argue against a general self-enhancement interpretation.

5.1. Implications for future research

These findings have several implications for future research. First, future studies should examine CFS using narrower personality constructs. This would permit us to test whether personality shifts are the result of specific facets, such as abnegation and assertiveness. Second, research should examine the extent to which these differences identified in self-reports extend to observer judgments. Are bilinguals perceived as more extraverted, agreeable, and conscientious when they speak in English rather than Spanish? Third, future studies should examine emotional expressiveness, a trait purported to be characteristic of collectivist cultures. Fourth, future research should extend these CFS personality effects to other types of Spanish-monolinguals (e.g., Colombian, Peruvian, Chilean, etc.) and biculturals (e.g., Colombian American, Peruvian American, Chilean American, etc.) in the US and in other parts of the world. Note that in this study, our stringent tests of bilingualism resulted in a relatively small sample of bilinguals in Mexico so we could not test the CFS phenomenon in biculturals living in Mexico. Fifth, future studies should examine the effects of acculturation on CFS. Do bilinguals who are more acculturated to the US have a greater (or lesser) shift of personality when they change languages? Does bilinguals' ethnic self-identification mediate personality shifts? Finally, although truly bilingual samples are hard to get, future research should focus on testing these effects in large

samples, especially in populations that were underrepresented in this research (e.g., Mexican-bilinguals living in Mexico). Together, such work will provide a more nuanced understanding of both the basic effects and mechanisms demonstrated in this research.

6. Conclusion

This investigation provides support for the CFS phenomenon (Hong et al., 1997, 2000). This phenomenon reflects the tendency of bicultural individuals (i.e., people who have internalized two cultures, such as bilinguals) to change their interpretations of the world, depending upon their internalized cultures, in response to cues in their environment (e.g., language, cultural icons). The results from the present series of studies suggest that CFS can be primed with something as subtle as the language, and can affect not only their attributions or values, but also their personality.

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