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INVESTIGATING IMPLICIT TRAIT THEORIES ACROSS CULTURES

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Implicit trait and contextual theories encompass lay people's beliefs about the longitudinal stability (vs. instability) of traits; the cross-situational consistency (vs. variability) of behavior; the ability to predict (vs. not predict) individuals' behavior from their traits; the ability to infer traits from few behavioral instances (vs. the difficulty of doing so); and the importance of traits in understanding people (vs. the greater importance of contextual factors such as roles and relationships). Implicit trait and contextual beliefs were investigated in two individualistic cultures, the United States and Australia, and two collectivistic cultures, Mexico and the Philippines. Hypotheses based on an integration of trait and cultural psychology perspectives were supported. The structure of implicit beliefs replicated well, and trait beliefs predicted judgments about cross-situational consistency of behavior in all four cultures. Implicit trait beliefs were stronger, and implicit contextual beliefs weaker, in the United States as compared to Mexico and the Philippines.

Keywords: implicit theories; traits; cultural psychology

Implicit theories, lay beliefs, or "naïve" psychologies play an important role in individuals' explanations and predictions of behavior and may differ across cultures (Dweck, 2000; Leung et al., 2002; Norenzayan, Choi, & Nisbett, 2002). For example, a number of psychologists have hypothesized that the cultural differences found in studies of self-concepts, dispositional inferences, and self-enhancement biases may be the result of cultural differences in implicit or lay theories of behavior. Several theorists have hypothesized that people in individualistic cultures have stronger implicit beliefs regarding the "traitedness" of behavior, which, in turn, leads to stronger emphases on (a) trait attributes as an aspect of self-

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concept, (b) trait inference in the observation of others, and (c) self-enhancement in the evaluation of one's own traits (e.g., Heine, Lehman, Markus, & Kitayama, 1999; Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997; Kobayashi & Brown, 2003; Kobayashi & Greenwald, 2003; Rhee, Uleman, Lee, & Roman, 1995; Triandis, 1995). In contrast, people in collectivistic cultures are hypothesized to have weaker implicit beliefs regarding the traitedness of behavior and stronger implicit beliefs regarding the role of contextual factors. This, in turn, leads to (a) greater focus on roles, statuses, and relationships as aspects of self-concept; (b) greater attention to situational information in causal inferences about behavior; and (c) weaker tendencies to self-enhance in self-descriptions. To test these hypotheses, we need cross-culturally valid measures of implicit theories or beliefs regarding the traitedness versus contextuality of behavior, which we refer to here as implicit trait and contextual theories.

Drawing on theorists' conceptions of lay dispositionism (e.g., Ross & Nisbett, 1991) and empirical studies (e.g., Chiu, Hong, & Dweck, 1997; Dweck, 2000; Norenzayan et al., 2002), Church et al. (2003) developed a measure of implicit trait and contextual beliefs in the personality domain composed of the following belief components: (a) belief in the longitudinal stability (vs. instability) of traits (*longitudinal component*); (b) belief in the cross-situational consistency (vs. variability) of trait-relevant behavior (*cross-situational component*); (c) belief in the ability to predict (vs. not predict) individuals' behavior from their traits (*predictive component*); (d) the belief that traits can be readily inferred from relatively few behavioral instances (vs. the difficulty or impossibility of doing so) (*trait inference component*); and (e) the belief that people can be accurately described and understood in terms of their traits (vs. the perceived greater importance of contextual factors such as roles, statuses, and relationships in person description) (*general understanding component*).

Church et al. (2003) showed that implicit trait and contextual beliefs can be reliably assessed, and that in a U.S. sample, implicit trait beliefs predict judgments regarding behavioral consistency. They also showed that the construct of implicit trait and contextual beliefs can be distinguished from Dweck's (2000) entity versus incremental theory construct, which differentiates individuals who believe that traits are fixed, as opposed to malleable. Church et al. conducted one cross-cultural study involving a presumed individualistic culture (the United States) and a presumed collectivistic culture (Mexico). They demonstrated good cross-cultural structural equivalence of the implicit trait theory construct and found partial support for the cultural psychology hypothesis that people in individualistic cultures, as compared to collectivistic cultures, have stronger implicit trait beliefs and weaker implicit contextual beliefs. The U.S. sample did exhibit stronger trait beliefs, but the two cultural groups did not differ significantly in the strength of their contextual beliefs. It was also noteworthy that implicit trait beliefs were fairly strongly endorsed in both the United States and Mexico, suggesting that such beliefs may be widely held, rather than unique to individualistic cultures.

In this study, we wished to extend these findings in several ways. First, we sought to test the structural equivalence of the implicit trait and contextual beliefs dimensions in additional cultures beyond the United States and Mexico. Accordingly, we collected new data in large U.S., Mexican, and Philippine samples and a smaller Australian sample. According to Hofstede (2001) and other researchers, the United States and Australia are among the most individualistic cultures, whereas Mexico and the Philippines are relatively collectivistic cultures (e.g., Church, 1987; Díaz-Loving & Draguns, 1999; Heine, 2001). For example, in a value-based ranking of 50 cultures, Hofstede (2001) ranked the 4 cultures on individualism as follows: United States, 1st; Australia, 2nd; Philippines, 31st; and Mexico, 32nd. We

wished to show that coherent dimensions of individual differences in trait and contextual beliefs exist in a greater range of cultures and are composed of the same belief components.

Hypothesis 1: Dimensions of implicit trait and contextual beliefs can be identified in all cultures, and exhibit good cross-cultural structural equivalence.

Second, we aimed to provide additional cross-cultural validity evidence for the implicit trait and contextual beliefs measure. Church et al. (2003) provided some convergent validity evidence for the new measure by showing that in an American sample, individuals' judgments about cross-situational consistency could be predicted from the strength of their trait beliefs. We sought to extend their results to another individualistic culture (Australia) and two collectivistic cultures (Mexico, Philippines).

Hypothesis 2: In all cultures, individuals' judgments about cross-situational consistency can be predicted from the strength of their implicit trait beliefs.

Third, because the construct of implicit trait and contextual beliefs shows some resemblance to aspects of Dweck's (2000) entity versus incremental theory construct, Church et al. (2003) deemed it important to demonstrate that the implicit trait and entity theory constructs are relatively distinct. Dweck's entity theory construct addresses the extent to which people believe that attributes are relatively fixed versus malleable. Although Dweck and colleagues (e.g., Chiu, Hong, et al., 1997) have inferred that implicit entity theorists should expect greater consistency of trait-relevant behavior and greater predictive validity of traits, these additional expectations about traits are not directly assessed. As expected, Church et al. found, in three American samples and one Mexican sample, that implicit trait beliefs and entity theory beliefs were only modestly related. However, Church et al. administered a domain-general entity theory measure, which assessed entity theory beliefs about attributes in general. Recently, Dweck presented a measure that assesses implicit entity theory beliefs specifically in the personality domain. In the present study, we wished to confirm, in additional cultures, that the implicit trait and entity theory constructs are relatively distinct, even when entity theories are measured specifically in the personality domain.

Hypothesis 3: In all cultures, implicit trait and contextual beliefs are only modestly associated with implicit entity theory beliefs.

Finally, we sought to provide further evidence of the construct validity of the implicit trait theory construct by confirming hypothesized cultural differences in implicit trait and contextual beliefs. Based on cultural psychology theory, which proposes that people in individualistic cultures, more than people in collectivistic cultures, favor trait explanations of behavior (i.e., lay dispositionism) (e.g., Heine et al., 1999; Kitayama et al., 1997; Rhee et al., 1995; Triandis, 1995), we expected to find support for the following hypothesis:

Hypothesis 4: People in all cultures endorse implicit trait beliefs to some extent; however, people in individualistic cultures, as compared to people in collectivistic cultures, average higher in implicit trait beliefs and lower in implicit contextual beliefs.

Given Dweck's (2000) conception of entity theory beliefs, one might predict that entity theory beliefs will also be stronger in individualistic cultures than collectivistic cultures.

However, the few studies that have examined this possibility have yielded inconsistent results. Norenzayan et al. (2002) did find stronger entity theory beliefs in Koreans, as compared to Americans. However, neither Chiu, Hong, et al. (1997) nor Chiu, Dweck, Tong, and Fu (1997) found Hong Kong samples to have stronger entity theory beliefs than American samples. Thus, we did not specify any a priori hypotheses about cultural differences in entity theory beliefs.

By directly testing a basic tenet of cultural psychology theory regarding personality and behavior—that persons in individualistic cultures have stronger implicit theories favoring the role of personality traits in behavior—the study can make a significant theoretical and empirical contribution in the area of culture and personality (Church, 2000; Markus & Kitayama, 1998). The results of the study are also relevant to Church's (2000) proposed integrated cultural trait psychology theory, which attempts to integrate theory and research from both trait psychology and cultural psychology perspectives (e.g., McCrae, 2000; Markus & Kitayama, 1998). From the trait perspective, the existence of heritable trait dimensions, at least some of which are universal across cultures (e.g., Katigbak, Church, Guanzon-Lapeña, Carlota, & del Pilar, 2002; McCrae & Allik, 2002), leads to the prediction that implicit trait beliefs will be endorsed to a significant degree in all cultures. However, from the cultural psychology perspective comes the prediction that persons in individualistic cultures will have stronger trait beliefs and weaker contextual beliefs than persons in collectivistic cultures. Support for our hypotheses, particularly Hypothesis 4, can thus provide important evidence for the validity of one aspect of the integrated cultural trait psychology approach (Church, 2000).

METHOD

SAMPLE

U.S. sample. A total of 362 college students (139 men, 221 women, 2 not reporting gender) at Washington State University provided valid and complete data for one or more of the three instruments in the study, the Personality Beliefs Inventory (PBI) ($n = 345$), the Behavioral Prediction Questionnaire (BPQ) ($n = 347$), and Dweck's (2000) entity theory measure ($n = 340$). Mean age was 20.7 years ($SD = 3.8$). Students from all year levels and a variety of major fields of study were sampled. Ethnic backgrounds were as follows: White or Caucasian ($n = 293$), Asian or Pacific Islander ($n = 15$), African American ($n = 9$), Latino ($n = 5$), Native American ($n = 4$), multiracial ($n = 21$), and other or not reporting ($n = 15$).[1]

Mexican sample. A total of 349 college students (155 men, 194 women) at the National Autonomous University of Mexico in Mexico City provided valid and complete data for one or more of the three instruments, the PBI ($n = 349$), the BPQ ($n = 337$), and Dweck's (2000) entity theory measure ($n = 339$). Mean age was 22.1 years ($SD = 3.0$). Students from all year levels were sampled. The majority of the students were majoring in social sciences (78%), the remainder in medicine and public health (15%) or other majors (7%). Self-reported ethnic backgrounds were as follows: 330 Mestizo, 10 Mexican American, and 9 indigenous Indian. Mestizos, who are of mixed Spanish and indigenous Indian ethnicity, are the majority ethnic group in Mexico.

Philippine sample. A total of 379 college students (136 men, 243 women) at Batangas State University in Batangas City, University of Santo Tomas in Manila, and De La Salle University in Manila provided valid and complete data for one or more of the three instruments, the PBI ($n = 379$), the BPQ ($n = 370$), and Dweck's (2000) entity theory measure ($n = 364$). Mean age was 18.0 years ($SD = 1.2$). Students from all year levels and a variety of major fields of study were sampled. Ninety-eight percent of the participants were ethnic Filipinos and 2% were ethnic Chinese.

Australian sample. After the exclusion of 20 international students, there were 82 Australian participants (20 men, 62 women) who provided valid and complete data for all three instruments. All students attended the University of New South Wales. Mean age was 19.9 years ($SD = 2.8$). Students from all year levels were sampled. The majority of participants were majoring in social science fields (71%), the remainder in a variety of majors. Self-reported ethnic backgrounds were as follows: Anglo-Celtic (38%), European (24%), Asian (23%), multiracial (9%), and other or not reporting (6%). We included this supplemental mixed-ethnicity sample only in analyses that did not require large sample sizes.

INSTRUMENTS

Language. All instruments were translated into Spanish and Filipino (Tagalog) using the back-translation method (Brislin, 1980). Translators were doctoral-level bilingual psychologists or graduate students. For the Australian instruments, a few items in the American English versions were modified slightly to reflect Australian English usage (e.g., *behavior* became *behaviour*). Questions about native language, best or primary language, and ability to answer questionnaires in the language of administration were asked in the demographic form. Only in the Philippines did we eliminate a few participants based on their responses to these questions.

PBI. The PBI (Church et al., 2003) measures implicit trait and contextual beliefs, with items that measure the longitudinal, cross-situational, predictive, trait inference, and general understanding belief components referred to in the introduction. See the appendix for sample PBI items. Using confirmatory factor analysis (CFA), Church et al. (2003) showed that a model with implicit trait and contextual beliefs as two exogenous dimensions, and item parcels (Kishton & Widaman, 1994) measuring the hypothesized belief components as endogenous indicators, fit the data well in both U.S. and Mexican samples. Items were rated using a 6-point agreement scale (*strongly disagree*, *somewhat disagree*, *slightly disagree*, *slightly agree*, *somewhat agree*, *strongly agree*).

We administered a 111-item version of the PBI. In all four cultures, a principal-axis factor analyses with oblique (oblimin) rotations yielded a first factor that was defined by the trait beliefs items; the second factor was defined by the contextual beliefs items, except for items from the general understanding component, which instead defined a small third factor in each culture. The general understanding component of contextual beliefs was also the weakest in the study by Church et al. (2003), so we excluded it from further analyses. We also eliminated some reverse-keyed items that failed to identify the inverse poles of the trait and contextual beliefs dimensions as intended, plus a small number of additional items that loaded less well in one or more of the cultures. Two-factor solutions in each culture (principal-axis extractions with oblimin rotations) for the remaining 79 items exhibited

fairly good similarity across cultures. Factor congruence coefficients (Tucker, 1951) ranged from .89 to .96 for the trait beliefs factor and .84 to .93 for the contextual beliefs factor. Thus, although the Australian sample was small for this analysis, the Australian results, in fact, replicated those in the other three cultures. Across the four cultures, alpha reliabilities for scales measuring the trait and contextual beliefs dimensions ranged from .87 to .92 for trait beliefs and .78 to .87 for contextual beliefs. In the Results section, we report a more formal test of cross-cultural structural equivalence in the large U.S., Mexican, and Philippine samples using CFA.

BPQ. Several researchers have used variants of a behavior prediction task in which participants judge the likelihood of an individual performing a particular trait-relevant behavior given prior information about the individuals' same-trait behavior in a different situation (e.g., Chiu, Hong, et al., 1997; Norenzayan et al., 2002). For example, in demonstrating that entity theory beliefs predict judgments of behavioral consistency, Chiu, Hong, et al. (1997) applied verbal scenarios (e.g., "Suppose you observed Jack and Joe in one particular situation and found that Jack was more friendly than Joe. What do you suppose is the probability that in a completely different situation, you would also find Jack to be more friendly than Joe?"). Chiu, Hong, et al. found that entity theorists gave higher probability judgments in such scenarios.

Church et al. (2003) developed an analogous behavior prediction task using nonverbal (pictorial) stimuli. This pictorial task was intended to reduce shared (verbal) method variance between the implicit trait beliefs measure and the criterion measure, and to more realistically simulate everyday interpersonal perception, which involves visual interpretation of observed behaviors in varying situational contexts. The BPQ used in this study was a 40-item version of the instrument used by Church et al. Each item contains a pair of pictures (line drawings) depicting two situational behaviors of a central figure. The behaviors measure Murray's (1938) needs (traits) and were largely selected from the Nonverbal Personality Questionnaire (NPQ) (Paunonen, Jackson, & Keinonen, 1990).[2] For some items (picture pairs), the same trait is implied by the behavior in each picture. For example, one same-trait item depicted two nurturance behaviors; the first picture showed the central figure assisting a blind person cross the street, whereas the second picture showed the central figure returning a fallen bird nest and young chicks to a tree. For other items, the behaviors depicted in the two pictures imply different and generally incompatible traits. For example, in one different-trait pair, the first picture depicted an affiliative behavior (i.e., being neighborly and friendly), whereas the second picture depicted behavior associated with a need for social recognition (i.e., status seeking and self-centeredness). We asked respondents to assume that the central figure had performed the behavior in the first picture and then to rate the likelihood that the central figure would perform the behavior in the second picture. Ratings were made on a 7-point scale: *extremely unlikely*, *very unlikely*, *moderately unlikely*, *neither likely nor unlikely*, *moderately likely*, *very likely*, *extremely likely*.

Paunonen et al. (1996) showed that the NPQ items assess the intended traits in a variety of cultures. In addition, in a pilot test, we asked college students in the United States, Mexico, and the Philippines (n = about 25 in each culture) to describe (a) what the central figure in each picture was doing and (b) what personality characteristic was implied by the behavior. A few pictures that were interpreted in a less consensus manner within or across cultures were not included in any BPQ items.

We factor analyzed the BPQ items in all four cultures using principal-axis extractions and oblique (oblimin) rotations. Replicating the findings of Church et al. (2003), in each culture

the pattern of eigenvalues suggested the need for two factors, which were clearly interpretable as same-trait and different-trait dimensions (factor congruence coefficients ranged from .87 to .98; five items with modest or dual loadings were eliminated). In the U.S., Mexico, and Philippine samples we also tested a CFA model with the same-trait and different-trait constructs as exogenous variables, each defined by three-item parcels (Kishton & Widaman, 1994). A multigroup model, in which the factor loadings and the covariance between the same-trait and different-trait constructs were constrained to be equal across the three cultures, fit the data very well ($\chi^2 / df = 2.87$, Goodness of Fit Index [GFI] = .97, Comparative Fit Index [CFI] = .98, root mean square residual [RMR] = .04, root mean square error of approximation [RMSEA] = .04), as well as the model in which the loadings and covariances were freely estimated in each culture, $\Delta\chi^2(10, N = 1{,}054) = 13.96$, $p > .01$.[3] Alpha reliabilities for the same-trait (19 items) and different-trait (16 items) scales ranged from .81 to .89 across the four cultures.

Entity theory measure. We administered a six-item entity theory measure that is specific to the personality domain (Dweck, 2000). Sample items include, "A person can do things to get people to like them, but they can't change their personality" (entity theorist) and "People can always change their personality" (incremental theorist; reverse keyed). Principal-axis factor analyses in all four cultures confirmed that a single bipolar (entity vs. incremental) dimension accounted well for the data. In the U.S., Mexican, and Philippine samples we also tested a multigroup CFA model with the entity theory construct as an exogenous variable defined by three two-item parcels. The fit of the constrained model, with factor loadings fixed to equality across the three cultures, was very good as judged by most fit indices ($\chi^2 / df = 3.76$, GFI = .99, CFI = .99, RMR = .06, RMSEA = .05), although not quite as good as a model with freely estimated loadings, $\Delta\chi^2(4, N = 1{,}043) = 15.03$, $p < .01$. Alpha reliabilities ranged from .77 to .89 across the four cultures. See Dweck (2000) for validity information.

PROCEDURE

In the U.S. and Australian samples, student volunteers were recruited in classes, completed the questionnaires on their own time, and returned them to class for pick-up or directly to the researchers. Students in the United States received extra credit for participation. In the Mexican and Philippine samples, student volunteers completed the questionnaires during regular classes. All students completed the PBI first, then the entity theory measure and BPQ.

RESULTS

CROSS-CULTURAL EQUIVALENCE OF IMPLICIT BELIEF STRUCTURE (PBI)

To test the cross-cultural equivalence of the implicit belief structure (Hypothesis 1), we applied a multigroup CFA in the U.S., Mexican, and Philippine samples. The general trait and contextual beliefs dimensions were exogenous variables, and the nine-item parcels (Kishton & Widaman, 1994) that measure each belief component were the observed indicators (excluding the general understanding component of contextual beliefs). A model in which the factor loadings were constrained to equality, but the covariances between the trait

and contextual beliefs constructs were freely estimated, fit the data well ($\chi^2 / df = 3.03$, GFI = .95, CFI = .95, RMR = .03, RMSEA = .04) and was a significant improvement over a more fully constrained model in which the covariances were also constrained to be equal across cultures, $\Delta\chi^2(2, N = 1{,}073) = 13.4$, $p < .01$.

Figure 1 shows the standardized estimates associated with the final model in the U.S. sample. The standardized factor loadings in the Mexican and Philippine samples were nearly identical to the loadings in the U.S. sample, and all factor loadings were statistically significant ($p < .05$). (Standardized parameter estimates, but not unstandardized estimates, can vary slightly across cultures when constrained to equality, because the variances of the variables were not constrained.) One secondary loading relating the trait inference component of contextual beliefs to the trait beliefs dimension was also incorporated in the model a priori because it had been introduced by Church et al. (2003, Study 3) in an earlier test of the model in the United States and Mexico. As noted by Church et al. (p. 337), this secondary loading makes substantive sense: Respondents who endorse the contextual trait inference items believe that it is difficult to infer traits from few behavioral instances; nonetheless, trait inference may eventually result. This secondary loading was statistically significant, but quite modest in size (standardized estimates = .13 to .17 across the three cultures). The model also included three correlated residuals (uniquenesses). These were needed in one or more cultures to account for greater shared uniqueness among belief components that were more positively or negatively correlated with each other than with other components. The freely estimated correlations between the general trait and contextual beliefs dimensions were different across cultures (–.34 in the United States, –.04 in Mexico, and –.03 in the Philippines), but all supported the relative independence of trait and contextual beliefs. In summary, consistent with Hypothesis 1, the structure of implicit trait and contextual beliefs exhibited good cross-cultural equivalence.

IMPLICIT TRAIT THEORIES AND JUDGMENTS OF BEHAVIORAL CONSISTENCY

In Figure 2, we depict how well trait and contextual beliefs predicted judgments regarding behavioral consistency across situations involving the same or different traits. For the U.S., Mexican, and Philippine samples, the figure shows the standardized path coefficients obtained from a structural equation modeling (SEM) analysis in which the measurement models were again constrained to be equal across cultures and the structural coefficients were freely estimated (for simplicity, the measurement models are not shown). The fit of the multigroup SEM model was very good ($\chi^2 / df = 2.00$, GFI = .94, CFI = .96, RMR = .03, RMSEA = .03) and was better than the fit of a model in which the path coefficients were constrained to be equal across cultures, $\Delta\chi^2(8, N = 1{,}339) = 21.34$, $p < .01$. For comparison purposes, the paths in Figure 2 for the smaller Australian sample are the β weights obtained when the PBI raw scores for trait and contextual beliefs were multiple predictors of same-trait judgments, then different-trait judgments in two multiple regression analyses. In all four cultures, the path coefficient (or β weight) relating contextual beliefs and same-trait judgments was not statistically significant, so that path is not included in Figure 2.

Consistent with Hypothesis 2, in all four cultures individuals with stronger implicit trait beliefs interpreted and made judgments about observed behaviors that indicate the following: (a) They expect greater consistency across situations for behavioral manifestations of the same trait and (b) they expect less consistency across situations for behavioral manifestations of different (i.e., generally incompatible) traits. In contrast, the strength of individuals'

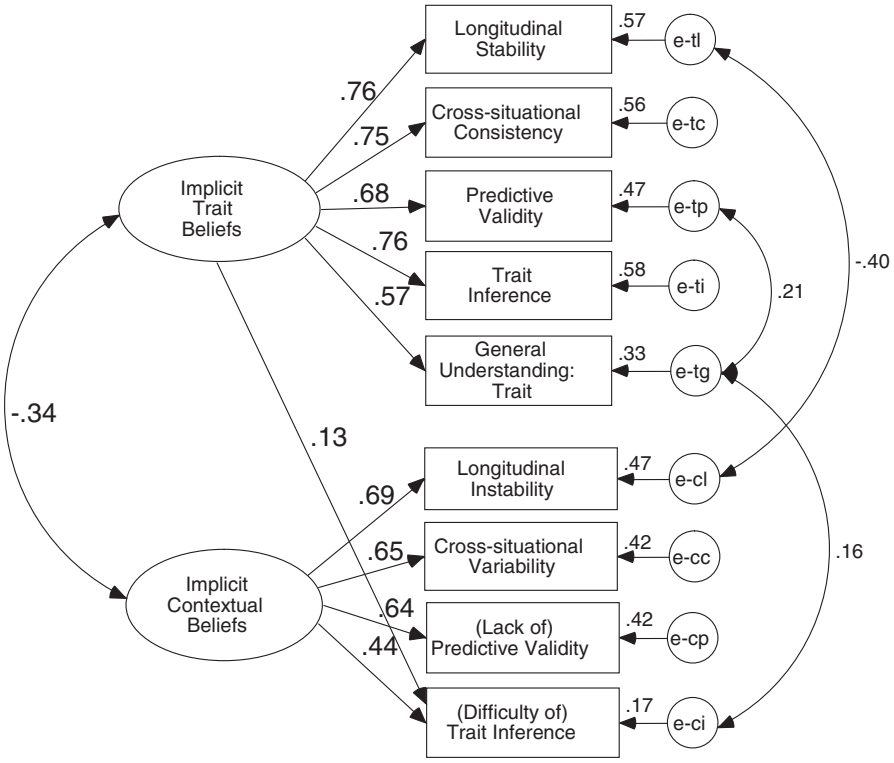

Figure 1: Standardized Estimates for a Cross-Cultural Model Testing the Structure of Implicit Trait and Contextual Beliefs Components

NOTE: e- indicates residual errors (uniquenesses) associated with each belief component: tl = trait longitudinal component; tc = trait cross-situational consistency component; tp = trait predictive component; ti = trait inference component; tg = trait general understanding component; cl = contextual longitudinal component; cc = contextual cross-situational variability component; cp = contextual predictive component; ci = contextual inference component. Factor loadings were constrained to be equal across cultures.

contextual beliefs did not predict judgments regarding the consistency of same-trait behaviors and were modest and less consistent predictors of consistency expectations for different traits. As addressed further in the Discussion section, these results provide some cross-cultural validity evidence for the implicit beliefs measure.

RELATING IMPLICIT TRAIT AND ENTITY THEORIES

We used CFA to examine the relationship between implicit trait and entity theory beliefs. Using the culturally equivalent measurement models, we freely estimated the covariances relating implicit trait and contextual beliefs to the entity theory construct in the U.S., Mexican, and Philippine samples. The model fit the data very well ($\chi^2 / df = 2.66$, GFI = .94, CFI = .95, RMR = .04, RMSEA = .04) and was significantly better than the model in which the two covariances were constrained to be equal across cultures, $\Delta\chi^2(4, N = 1{,}343) = 23.37$, $p < .01$. The correlations between trait beliefs and entity theory beliefs were as follows (using raw score correlations in the Australian sample for comparison purposes): in the United States, $r = .01$, $p > .05$; in Mexico, $r = .28$, $p < .01$; in the Philippines, $r = .11$, $p = .08$; and in Australia, $r =$

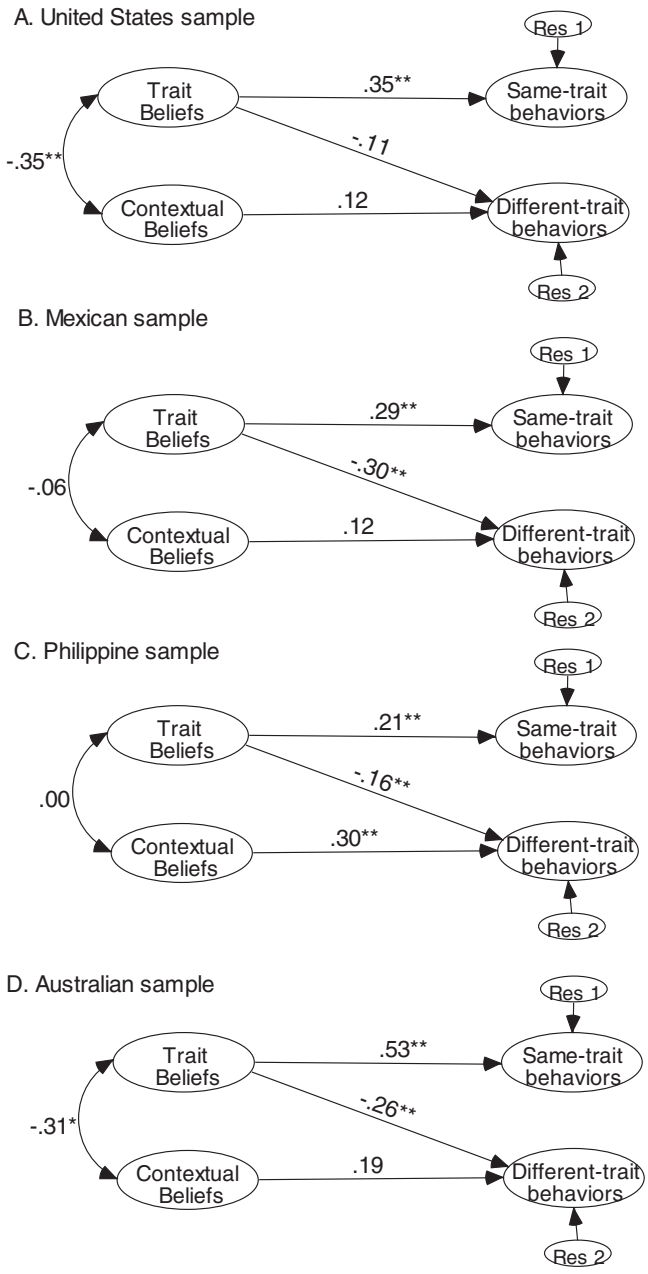

Figure 2: Path Coefficients Relating Implicit Trait and Contextual Beliefs to Expectations of Consistency for Behavioral Manifestations of the Same and Different Traits

NOTE: For the U.S., Mexican, and Philippine samples, path coefficients are from a structural equation modeling analysis. In the Australian sample, the path coefficients are β weights obtained in multiple regression analyses (see text). Only paths that were statistically significant in one or more cultures are shown. Res 1 and Res 2 represent residual error terms in the prediction of same-trait and different-trait behaviors, respectively.

*$p < .05$. **$p < .01$.

.26, $p < .05$. The correlations between contextual beliefs and entity theory beliefs were as follows: in the United States, $r = -.15$, $p < .05$; in Mexico, $r = -.34$, $p < .01$; in the Philippines, $r = -.17$, $p < .05$; and in Australia, $r = -.18$, $p < .05$. Thus, our expectation of a modest positive relationship between implicit trait and entity theory beliefs was supported in the Mexican and Australian samples, marginally supported in the Philippine sample ($p = .08$), and not supported in the U.S. sample. The expected negative but modest relationship between contextual beliefs and entity theory beliefs was supported in all four cultures. Thus, Hypothesis 3 was largely supported.

CULTURAL MEAN DIFFERENCES

We examined cultural mean differences using multigroup mean and covariance structure (MACS) analyses and the AMOS 4.0 program. MACS analyses have several advantages over comparisons of raw scores, including disattenuation of measurement error and built-in tests of cross-cultural metric equivalence (Byrne, 2001). However, MACS analyses estimate the difference between cultural means, not the means themselves. To identify MACS models, and to establish metric equivalence across cultures, it is necessary to constrain all factor loadings and observed variable intercepts in the measurement models to be equal across cultures (Arbuckle & Wothke, 1999, p. 290; Byrne, 2001, p. 237). The legitimacy of these constraints can be evaluated using the model fit indices. The Australian sample was too small for inclusion in the MACS analyses.

The MACS models for the PBI ($\chi^2 / df = 4.55$, CFI = .99, RMSEA = .06) and BPQ ($\chi^2 / df = 3.01$, CFI = .99, RMSEA = .04) fit the data well, indicating that the assumption of metric equivalence was reasonable for these two models (GFI and RMR indices are not computed by AMOS 4.0 for MACS models). The MACS model for the entity theory measure fit the data well after freely estimating the intercept for one of three-item parcels, which could not be considered equal across the three cultures ($\chi^2 / df = 3.26$, CFI = .99, RMSEA = .05). Because only partial measurement invariance was demonstrated for the entity theory measure, the cultural mean differences for entity theory beliefs should be interpreted more cautiously.

The raw score means and the differences between latent means are shown in Table 1, with the United States as the reference sample (i.e., the latent means for the United States were fixed to zero).[4] The significant mean differences support the construct validity of the implicit theory measure and Hypothesis 4. As predicted, respondents in each culture endorsed implicit trait beliefs to a considerable degree. The cultural means, which range from 3.99 to 4.35, correspond to *slightly* to *somewhat agree* on the original rating scale. Indeed, all three cultural groups endorsed trait beliefs to a greater extent than contextual beliefs. Nonetheless, as predicted, participants in the individualistic culture, as compared to participants in the two collectivistic cultures, averaged higher in trait beliefs and lower in contextual beliefs. Consistent with these differences, students in the U.S. sample, as compared to the Mexican and Philippine samples, also predicted greater consistency across situations for behavioral manifestations of the same trait but less consistency across situations for behavioral manifestations of different (incompatible) traits. In contrast, the students in the two collectivistic cultures exhibited stronger entity theory beliefs than did the students in the United States. This different pattern of cultural differences for implicit trait and entity theory beliefs again supports the distinctiveness of the two theoretical constructs across cultures.

TABLE 1
Cross-Cultural Mean Differences in Implicit Theories and Expectations of Behavioral Consistency

	Raw Score Means			*MACS Analysis*		
Construct	*U.S.*	*Mexico*	*Philippines*	*U.S.*	*Mexico*	*Philippines*
Trait beliefs						
Mean	4.35	3.99	4.29	0.00_a	$-.36_b$	$-.09_c$
Standard deviation	0.50	0.68	0.46			
Contextual beliefs						
Mean	3.49	3.56	3.92	0.00_a	$.15_b$	$.50_c$
Standard deviation	0.44	0.49	0.40			
Behavioral consistency						
Same trait						
Mean	5.68	5.45	5.33	0.00_a	$-.23_b$	$-.35_c$
Standard deviation	0.59	0.74	0.60			
Different trait						
Mean	3.40	4.04	3.73	0.00_a	$.65_b$	$.34_c$
Standard deviation	0.66	0.83	0.72			
Entity beliefs						
Mean	3.04	4.03	3.33	0.00_a	$.61_b$	$.40_c$
Standard deviation	1.03	1.01	0.78			

NOTE: MACS = mean and covariance structure. Raw scores for trait, contextual, and entity theory beliefs can range from 1 to 6; raw scores for behavioral consistency can range from 1 to 7. In the MACS analysis, means are expressed as deviations from the U.S. reference group, and means annotated with different subscripts were significantly different from each other (critical ratio > 1.96).

FOLLOW-UP ANALYSES

A limitation of the current PBI instrument is the absence of reverse-keyed items in the trait and contextual beliefs scales. This raises the question of whether the relative independence of the trait and contextual belief constructs in each culture might be, at least in part, an artifact of acquiescence bias. Individual differences in acquiescence bias can reduce negative correlations between constructs that might otherwise represent bipolar opposites. To investigate this possibility, we followed procedures recommended by Hofstee, Ten Berge, and Hendriks (1998) for controlling acquiescence bias (see their acquiescence component procedures). These procedures assume that the trait and contextual belief constructs are, in fact, bipolar rather than relatively independent, so that the corrections for acquiescence do not also eliminate valid content variance, an assumption that we return to in the Discussion section.

We derived an acquiescence component score using the following steps. First, we paired trait and contextual beliefs items from the same conceptual facet, which were presumed to be opposites (e.g., a trait longitudinal item with a contextual longitudinal item, a trait situational item with a contextual situational item, etc.). We derived 26 such pairs, and the score for each pair was the mean of the two items. Because items in each pair are assumed to be logical opposites, higher mean scores across each pair suggest greater acquiescence bias. Scores on the first component in a principal components analysis with these 26 items constitutes an estimate of acquiescence bias (Hofstee et al., 1998). Each PBI item was then regressed on the acquiescence component score. The resulting residual item scores are by definition uncorrelated with acquiescence.

We computed one-factor principal axis solutions on the residual item scores in all four cultures separately. In each culture, the single factor was well defined at the positive pole by the trait beliefs items. Most of the contextual longitudinal items had moderately high negative loadings on this factor as well and could therefore be viewed as bipolar opposites of the trait beliefs items when acquiescence is controlled. (Indeed, the largest correlated residual introduced in the PBI model shown in Figure 1 reflects this residual inverse relationship between trait and contextual longitudinal beliefs.) Some contextual items from the situational variability and predictive validity components had modest negative loadings on the single factor in each culture, suggesting weak and inconsistent bipolarity. However, most of the contextual inference items, in particular, were not well accounted for by the single factor. Evidence of trait-versus-contextual bipolarity was strongest in the Australian sample.

In two-factor solutions in the United States and Mexico, the first factor was largely a trait beliefs factor, but the contextual longitudinal items loaded negatively on the factor; the second factor was defined by most of the remaining contextual beliefs items. In the Philippines, the first factor was primarily a contextual beliefs factor, but the trait longitudinal items loaded inversely on the factor; the second factor was primarily a trait beliefs factor, but with some contextual inference items loading inversely. In the Australian sample, the first factor retained a degree of bipolarity in the two-factor solution, but three of the trait beliefs components—predictive, inference, and general understanding—defined the second factor. In summary, although there was evidence of some bipolarity in the one-factor solutions, particularly for the longitudinal items, the two-factor solutions better accounted for all of the items, even after controlling for acquiescence.

Again assuming trait-versus-contextual bipolarity, we controlled for acquiescence a second way. For the longitudinal, situational, predictive, and inference components, we computed difference scores between the trait and contextual beliefs scores (a difference score for the general understanding component was not computed because we previously eliminated the contextual general understanding component). We then conducted a multigroup CFA in the U.S., Mexican, and Philippine samples with a single exogenous construct—trait-versus-contextual beliefs—and the four component difference scores as the observed indicators.[5] The fit of the multigroup model, with the four factor loadings constrained to equality across the three cultures, was very good ($\chi^2 / df = 2.03$; GFI = .99; CFI = .99; RMSEA = .03; RMR = .04) and not significantly worse than the fit of a model with freely estimated (unconstrained) loadings, $\Delta\chi^2(6, N = 1{,}073) = 5.83$, $p > .05$. This confirmed the equivalence of the trait-versus-contextual-beliefs measurement model across cultures.

We then conducted a multigroup SEM analyses, with the trait-versus-contextual-beliefs construct predicting judgments of behavioral consistency for same-trait and different-trait behaviors. The fit of a model in which the path coefficients were constrained to equality across the three cultures was very good ($\chi^2 / df = 1.93$; GFI = .96; CFI = .97; RMSEA = .03; RMR = .05) and virtually identical to the fit of the unconstrained model, $\chi^2 / df = 1.88$; GFI = .96; CFI = .98; RMSEA = .03; RMR = .04; $\Delta\chi^2(4, N = 1{,}039) = 13.01$, $p < .05$. Trait-versus-contextual beliefs, treated as a bipolar construct, predicted consistency judgments for same-trait behaviors (range of standardized path coefficients = .21 to .27, $p < .01$) and, inversely, for different-trait behaviors (range of standardized path coefficients = –.21 to –.28, $p < .01$). Even stronger relationships were found in the Australian sample when we correlated the relevant raw scores. Trait-versus-contextual beliefs correlated .50 ($p < .01$) with consistency judgments for same-trait behaviors and –.39 ($p < .01$) for consistency judgments for different-trait behaviors.

We next examined a multigroup CFA model relating the trait-versus-contextual beliefs construct to Dweck's (2000) entity-versus-incremental theory construct. The fit of a model in which the covariance between the two constructs was constrained to be equal across cultures was not as good, $\Delta\chi^2(2, N = 1{,}043) = 67.08$, $p < .01$, as the model with freely estimated covariances, which fit the data very well ($\chi^2 / df = 2.09$; GFI = .97; CFI = .98; RMSEA = .03; RMR = .06). The correlations between trait-versus-contextual beliefs and entity-versus-incremental beliefs were .13 ($p < .05$) in the United States, .45 ($p < .01$) in Mexico, and .21 ($p < .01$) in the Philippines. In the Australian sample, the comparable raw score correlation was .26 ($p < .01$).

Finally, we conducted a MACS analysis comparing the means of the U.S., Mexican, and Philippine samples on the bipolar trait-versus-contextual-beliefs construct. Model fit was very good ($\chi^2 / df = 2.81$; CFI = .98; RMSEA = .04), and, as predicted by theory, the mean estimates for the Mexican (–.47, $p < .01$) and Philippine (–.62, $p < .01$) samples were significantly lower than the mean (.00) of the U.S. reference group. In summary, although there may remain some question whether trait and contextual beliefs should be treated as relatively independent dimensions or as a single bipolar dimension, the primary hypotheses of the study were supported in either case.

DISCUSSION

Several cross-cultural researchers have proposed that implicit theories or beliefs regarding personality traits may underlie important cultural differences in the content of self-concepts (e.g., Kanagawa, Cross, & Markus, 2001), trait versus situational attributions regarding behavior (Chiu, Hong, et al., 1997; Newman, 1993), and self-enhancement tendencies (e.g., Heine et al., 1999). Before this mediating role of implicit trait theories or beliefs can be tested directly, researchers need to be able to measure such beliefs in a reliable and equivalent manner across cultures. In this study, we extended initial results reported by Church et al. (2003) by (a) examining the cross-cultural structural equivalence and convergent validity of the new implicit trait beliefs measure in additional individualistic and collectivistic cultural samples and (b) testing theory-based hypotheses regarding cultural mean differences. We found good support for each of our hypotheses, which we consider here, in turn.

STRUCTURAL EQUIVALENCE OF IMPLICIT THEORIES

As predicted in Hypothesis 1, distinct trait and contextual beliefs dimensions were identified in all four cultures, and structural equivalence across cultures was good. These results indicate that the hypothesized belief components of longitudinal stability, cross-situational consistency, predictive validity, trait inference, and general understanding cohered well on the more general trait and contextual beliefs dimensions. These results reveal the organization or structure of implicit trait and contextual beliefs and suggest that this organization may be comparable across cultures.

Nonetheless, there are some remaining questions or limitations involving the implicit theories construct and measure. One was the failure of the general understanding component of contextual beliefs to load or cohere well with the other four contextual beliefs components. Additional analyses and revision of the items for this component may be needed. A second limitation is the absence of reverse-keyed items for either the trait or contextual beliefs

scales, raising questions about the potential role of acquiescence bias (Hofstee et al., 1998). Indeed, new items written specifically to serve as reverse-keyed items instead tended to load on the other dimension (i.e., items written to assess the negative pole of the trait beliefs dimension loaded positively on the contextual beliefs dimension, and vice versa).

This limitation is not unique to this study. Indeed, many prominent measures of cultural dimensions, such as Triandis's measure of individualism-collectivism (Singelis, Triandis, Bhawuk, & Gelfand, 1995; Triandis, 1995), Singelis's (1994) Self-Construal Scale, Kashima and Hardie's (2000) Relational-Individual-Collective self-aspects (RIC) scale, and Choi, Dalal, Kim-Prieto, and Park's (2003) Holistic Tendency Scale contain no reverse-keyed items. Some researchers have reported the same difficulty we have experienced in identifying reverse-keyed items, for example, in the development of measures of holistic thinking (Choi et al., 2003) and entity theory beliefs (Chiu, Dweck, et al., 1997). Individual differences in acquiescence response bias could artificially contribute to the independence of dimensions that might otherwise exhibit greater bipolarity.

Researchers have nonetheless interpreted the apparent independence of individualism and collectivism, or independent and interdependent self-construals, as theoretically meaningful findings, suggesting that individuals in all cultures can have both individualistic and collectivistic or independent and interdependent tendencies (e.g., Singelis, 1994; Triandis, 1995). Similarly, we believe that the relative independence of the implicit trait and contextual beliefs dimensions could be a theoretically meaningful finding, implying that individuals in all cultures can believe in the importance of both traits and context. That is, individuals in all four cultures could be implicit interaction theorists, in the sense that they believe that both traits and contexts need to be taken into account in understanding and predicting behavior. This is consistent with the findings of Norenzayan et al. (2002). They found that for both American and Korean respondents, endorsements of paragraphs describing dispositionist and situationist perspectives were uncorrelated and that interactionist descriptions were endorsed more than either the dispositionist or situationist descriptions.

Nonetheless, it is possible that acquiescence response bias contributes to the relative independence of the trait and contextual beliefs dimensions. Accordingly, we reported some follow-up analyses, which resulted in two general findings. First, when procedures were applied to control for acquiescence bias, we found some evidence of bipolarity in the data, particularly for the longitudinal component of trait-versus-contextual beliefs. However, even after controlling for acquiescence, the bipolar trait-versus-contextual-beliefs construct related to behavioral consistency judgments and entity theory beliefs, and exhibited cultural mean differences, in the manner predicted by our hypotheses. That is, conclusions regarding our research hypotheses did not change.

Nonetheless, we feel the question of whether it is best to control for acquiescence bias when applying the PBI and similar measures in cross-cultural studies is unresolved. Recall that our procedures for controlling acquiescence assumed that trait and contextual beliefs are indeed opposite poles of a single bipolar construct. If, in fact, people can legitimately agree with both trait and contextual items (i.e., they are interaction theorists), then it is quite possible that controlling for acquiescence will eliminate valid content variance in their responses and impose a greater degree of bipolarity than is justified. Ultimately, the best way to resolve this question may be to determine whether the trait and contextual beliefs dimensions exhibit different patterns of correlations with external variables. If so, it would suggest that it is best to treat them as relatively independent constructs. In this study, there was some indication that the two constructs did relate differently to behavioral consistency judgments. In our previous study, the two constructs related somewhat differently to measures of self-construal.

Whereas independent self-construals predicted the strength of trait beliefs, they did not predict contextual beliefs (Church et al., 2003). In summary, although researchers may wish to analyze PBI data both with and without controlling for acquiescence, we believe it remains profitable to examine the correlates of the two dimensions separately.

IMPLICIT TRAIT THEORIES AND JUDGMENTS OF BEHAVIORAL CONSISTENCY

Church et al. (2003) provided convergent validity evidence for the implicit theory measure in predicting judgments regarding trait-relevant behavioral consistency, but only in a U.S. sample. In this study, we extended those results to another individualistic culture (Australia) and two collectivistic cultures (Mexico, Philippines). Hypothesis 2 was supported. In each of these cultures, individuals who endorsed implicit trait beliefs to a greater extent also made judgments about observed behaviors that revealed greater expectations of cross-situational consistency for behavioral manifestations of the same trait. Also replicated across four cultures was a more modest tendency for individuals with stronger trait beliefs to report *lower* likelihoods of observed behaviors associated with different (i.e., generally incompatible) traits. This latter finding also seems sensible. Individuals with stronger trait beliefs—who view traits as relatively stable internal dispositions—tend to view the coexistence or manifestation of incompatible traits in the same person as less likely.

In contrast, we found that the relationships between contextual beliefs and consistency expectations were less consistent and more modest, as did Church et al. (2003) in the United States. One plausible explanation is the following: Individuals with stronger contextual beliefs—who tend not to infer traits from behavior—are less likely to interpret the behaviors depicted in the BPQ items in terms of traits. If they do not, then their judgments about the likelihood of the behaviors would probably depend on other factors, such as the similarity of the situations in the two pictures, rather than the traits that are supposed to be implied by the behaviors. In short, trait and contextual theorists may have different bases for their judgments about behavioral consistency in the pictorial stimuli, with only the trait theorists focusing consistently on the traits implied by the situational behaviors.

These results are not tautological. In completing the behavior prediction task (BPQ), participants did not merely restate (e.g., in a verbal item) that they believed in cross-situational behavioral consistency. Rather, they viewed a central figure's behavior in a situational context, did (or did not) infer a trait from the situational behavior, then judged whether the behavior had any implications for whether the central figure would do the behavior depicted in a different situation. Indeed, we believe the task has greater ecological validity than the typical verbal scenarios used in previous studies.

IMPLICIT TRAIT VERSUS ENTITY THEORIES

It is important to show that new constructs are distinct from others in the literature. Of several implicit theory constructs in the literature, we singled out Dweck's (2000) entity theory construct because it appeared most similar to our implicit trait theory construct. We showed, however, that the constructs are relatively distinct, supporting Hypothesis 3. Although entity beliefs were generally positively associated with trait beliefs and negatively associated with contextual beliefs, relationships were modest in size. Whether measured specifically in the personality domain, as in the present study, or with a more domain-general measure (Church et al., 2003), the entity theory construct appears to be narrower (e.g., in focusing only on

longitudinal stability) and more deterministic than the implicit trait theory construct. In our conception of implicit trait theories, the longitudinal component is more probabilistic than deterministic (e.g., "People who are friendlier than others now will probably remain friendlier than others in the future as well"). We assume that implicit trait theorists, like most trait psychologists, do not view traits as fixed or nonmalleable, but only as relatively stable over time, at least as reflected in the rank ordering of individuals. In addition, judging from the item content of the entity theory measures (e.g., "Everyone is a certain kind of person and there is not much that can be done to really change that"), plus some empirical findings (e.g., Levy, Stroessner, & Dweck, 1998), entity theorists appear to take a more rigid stance on the possibility of longitudinal change than most trait theorists would. For example, as Dweck (2000, p. 88) noted, "Simply put, entity theorists don't grant people the potential to grow." Finally, the different pattern of cultural mean differences for the implicit trait and entity theory constructs further implies that the constructs are distinct and that people respond differently to the items in the two measures.

CULTURAL MEAN DIFFERENCES

The cultural means were consistent with Hypothesis 4. As predicted by Church's (2000) integrated cultural trait psychology theory, participants in each culture endorsed trait beliefs to some extent. They tended, on average, to *slightly* or *somewhat agree* with the items. This finding suggests that implicit trait theories are not unique to individualistic cultures (see also Norenzayan et al., 2002) and may reflect the universal impact of heritable personality traits on person perception and lay reasoning about behavior across cultures. Nonetheless, participants in the individualistic United States, as compared to participants in the two collectivistic cultures, Mexico and the Philippines, did average higher in trait beliefs and judgments of consistency for behavioral manifestations of the same trait, and lower in contextual beliefs and consistency expectations for different (i.e., generally incompatible) traits. These results also support Hypothesis 4 and provide evidence that cultural psychology predictions of cultural differences in implicit beliefs regarding the traitedness of behavior are correct (e.g., Markus & Kitayama, 1998; Newman, 1993).

No a priori predictions were made about cultural differences in entity theory beliefs because previous cross-cultural comparisons have yielded inconsistent results (Chiu, Dweck, et al., 1997, Study 5; Chiu, Hong, et al., 1997, Study 4; Church et al., 2003; Norenzayan et al., 2002). Our results are consistent with the subset of studies that have found entity theory beliefs to be stronger in Asian or collectivistic cultures than in the United States (Chiu, Dweck, et al., 1997, Study 5; Church et al., 2003). The theoretical basis for stronger entity theory beliefs in Asian cultures, or in collectivistic cultures more generally, has not yet been fully elaborated. However, Chiu, Dweck, et al. (1997) did link stronger entity theories in the morality domain with duty-based moral codes and noted that Asian cultures tend to endorse duty-based moral codes.

FINAL COMMENTS

Two limitations of the study should be noted. First, we did not directly assess individualism or collectivism in our samples, for example, with individual-level assessments. Unfortunately, such assessments are frequently inconclusive because they often fail to conform to expectations based on culture-level analyses or rankings of cultures (Hofstede, 2001) (e.g.,

see Heine, Lehman, Peng, & Greenholtz, 2002; Matsumoto, 1999; Oyserman, Coon, & Kemmelmeier, 2002; Takano & Osaka, 1999). Our results conformed well to theory if we assume that our placement of cultures along the individualism-collectivism dimension was correct. Another limitation of the study was the smaller size and ethnic heterogeneity of the Australian sample. This prevented meaningful inclusion of the Australian sample as a second individualistic culture in the examination of cultural mean differences. Nonetheless, we retained the Australian sample because it contributed additional confirming evidence for our other hypotheses. In any case, our inclusion of large cultural samples in the United States, Mexico, and the Philippines enabled two comparisons along the individualism-collectivism continuum (i.e., United States versus Mexico and United States versus Philippines), and the collectivistic cultures came from two different continents.

Despite these limitations, the study provided significant support for the cross-cultural generalizability of the implicit trait theory construct and its utility in testing hypotheses derived from trait psychology and cultural psychology perspectives. The implicit theory measure could now be used to test the hypothesized mediating role of implicit trait beliefs in accounting for cultural differences in self-concept, dispositional attribution, and self-enhancement (e.g., Heine et al., 1999; Kitayama et al., 1997; Newman, 1993; Norenzayan et al., 2002). Ultimately, the goal is to integrate the trait psychology and cultural psychology perspectives that currently dominate research on culture and personality (Church, 2000).

APPENDIX
Sample Items From Personality Beliefs Inventory

Belief Component	*Sample Item*
Implicit trait beliefs	
Longitudinal stability	People who are quite industrious when they are students will probably be quite industrious in their jobs as adults.
Cross-situational consistency	An adolescent who is generally rebellious at home is probably also rebellious at school.
Predictive validity	How funny a person will be at a party can be predicted very well from the person's personality characteristics.
Trait inference	If I saw a person return some lost money to its owner, I would probably conclude that the person is an honest person in general.
General understanding	For someone to understand me well, they would need to know some of my personality characteristics.
Implicit contextual beliefs	
Longitudinal instability	How arrogant a person is will tend to change a lot over time.
Cross-situational variability	A person who is hotheaded at home might be calm and patient with friends.
Lack of predictive validity	Even if we know how competitive a person tends to be, it does not tell us how competitive he or she will be in a particular situation.
Difficulty of trait inference	It is hard to judge how timid a person is until you have interacted with him or her in many social situations.
General understanding	It makes little sense to describe people in terms of their personality characteristics because people are better understood in terms of their roles and duties in various situations.

NOTES

1. In the U.S. sample, the factor structures in the total sample and in the White or Caucasian subsample for the implicit theory measure were highly congruent (e.g., .99 for both factors in the two-factor solutions) (Tucker, 1951). In addition, the construct means for the total sample and White or Caucasian subsample were virtually identical. Therefore, only results for the total U.S. sample are reported.

2. We thank Sampo Paunonen for permission to adapt the Nonverbal Personality Questionnaire stimuli for this purpose.

3. We used the AMOS 4.0 program (Arbuckle & Wothke, 1999) for all confirmatory factor analyses (CFA) and structural equation modeling analyses. In the constrained CFA models in this study, we did not specify equality constraints for error variances and residual covariances, which are generally considered too stringent (Byrne, 2001). Due to space considerations, we do not display some exploratory and confirmatory factor solutions, but these are available from the first author.

4. Significance levels for the mean differences between the Mexican and Philippine samples were obtained by rerunning the same mean and covariance structure (MACS) analyses with Mexico as the reference group. In a preliminary MANOVA on raw scores, none of the variables showed significant main effects for gender. The contextual beliefs score exhibited a significant Culture × Gender interaction effect ($p < .01$), but the effect size was trivial (partial $\eta^2 = .01$). Therefore, men and women were combined for the MACS analysis.

5. Aside from the conceptual rationale for computing trait-versus-contextual difference scores, we also verified empirically that these difference scores, in fact, had the same effect as the more complex residual procedure (Hofstee, Ten Berge, & Hendriks, 1998) we described previously. In each of the four cultures, we computed the correlation between the factor scores for the one-factor (i.e., bipolar) solutions obtained with the residual items after controlling for acquiescence and the total trait-versus-contextual raw score derived by taking the mean of the trait-contextual difference scores for the longitudinal, situational, predictive, and inference components. The correlations ranged from .92 to .97 across the four cultures.

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