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Culture and the Behavioral Manifestations of Traits: An Application of the Act Frequency Approach

A. Timothy Church, **Marcia S. Katigbak**, **Lilia G. Miramontes**, and **Alicia M. del Prado**
Department of Educational Leadership and Counseling Psychology, Washington State University; Helena F. Cabrera, College of Commerce, University of Santo Tomas, Manila

Abstract

The behavioral manifestations of Big Five traits were compared across cultures using the Act Frequency Approach. American (n = 176) and Filipino (n = 195) students completed a Big Five measure and act frequency ratings for behaviors performed during the past month. Acts for specific traits cohered to an equivalent degree across cultures. In both cultures, the structure of act composites resembled the Big Five and the strength of trait-behavior relationships was very similar. Many acts were multidimensional and analyses revealed cultural commonalities and differences in the relevance and prevalence of acts for the Big Five traits. The results were more consistent with trait than cultural psychology perspectives, because traits predicted behavior equally well, on average, in the two cultures.

Keywords

culture; traits; act frequency approach; Big Five

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The study of personality traits across cultures has expanded rapidly in the past decade (Church, 2000; McCrae, Terracciano, & 79 Members of the Personality Profiles of Cultures Project, 2005; Triandis & Suh, 2002). Thus far, trait psychologists have focused primarily on the cross-cultural universality of personality trait structure. For example, researchers have found that the Five Factor Model (FFM), comprised of the "Big Five" dimensions of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness, replicates well across cultures (McCrae & Allik, 2002).[1] More recently, proponents of the FFM have conducted extensive multinational comparisons of Big Five profiles and begun to infer cultural differences in personality trait levels (McCrae et al., 2005), despite the concerns of some cross-cultural psychologists that scalar equivalence or full-score comparability might not be achieved in such comparisons (Poortinga, van de Vijver, & van Hemert, 2002).

Equally important, but rarely investigated, is the extent to which the behavioral manifestations of traits are comparable across cultures. Such a focus would address fundamental questions

Correspondence concerning this article should be addressed to A. Timothy Church, Department of Educational Leadership and Counseling Psychology, Cleveland Hall, Washington State University, Pullman, WA 99164-2136, USA, church@mail.wsu.edu.

[1]Other personality structure models, such as the six-dimensional HEXACO model (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience), have also replicated well across cultures (Ashton et al., 2004). This has raised questions about the most comprehensive or optimal model of universal personality structure. Our intent in the present article is not to advocate the superiority of the Five-Factor Model over alternative models, but to illustrate how cultural similarities and differences in the behavioral manifestations of personality dimensions can be investigated.

for trait psychology, including the following: Do individuals who score high on a particular trait, for example, conscientiousness, exhibit the same trait-related behaviors in their respective cultural contexts, or is the trait of conscientiousness manifested differently across cultures? Are certain trait-related behaviors exhibited more frequently in some cultures than others? Do the behaviors associated with particular traits exhibit a similar co-occurrence structure across cultures (e.g., in factor analysis)? Do traditional personality trait measures predict single or aggregated composites of behaviors equally well across cultures?

The answers to these questions are significant for trait theory and its application across cultures. From a theoretical perspective, they address the equivalence of trait dimensions and their behavioral manifestations across cultures, and even the viability of the trait concept for studies of the relationship between culture and personality. From an applied perspective, the cross-cultural equivalence of the behavioral manifestations of traits has implications for the measurement equivalence of trait measures and the extent to which these measures can predict similar criteria in different cultural contexts. To some extent, the answers to these questions can also address the current debate between trait and cultural psychologists regarding the importance or role of traits in individualistic versus collectivistic cultures.

Many trait psychologists view the Big Five dimensions as universal, heritable dimensions that should predict relevant behaviors in all cultures (e.g., Church, 2000; McCrae, 2000; McCrae & Costa, 1996). For example, in McCrae and Costa's Five-Factor Theory of personality, individuals are expected to evolve patterns of behavior that are consistent with their personality traits (e.g., “Extraverts join social clubs and learn to dance”; p. 74). At the same time, the theory posits that innate basic tendencies such as the Big Five traits interact with the environment, including cultural influences, to shape the “characteristic adaptations” (e.g., personal strivings, attitudes, habits) that guide behavior. Thus, some cultural differences in the behavioral manifestations of traits are consistent with a trait perspective. Five-Factor Theory also predicts that most behaviors will be determined by multiple traits, noting that “there is rarely a one-to-one correspondence between a behavior and a single trait” (p. 74). For example, McCrae and Costa pointed out that reading a book can reflect both an introverted need for solitude and an Openness-to-Experience-related desire for intellectual stimulation.

Whereas trait psychologists generally adopt a universalistic perspective on the importance of traits across cultures, cultural psychologists[2] have emphasized the socially constructed nature of self and personality and questioned the universality and predictive value of traits across cultures (Markus & Kitayama, 1998;Shweder, 1991). For example, Markus and Kitayama have argued that different assumptions underlie personality conceptions in individualistic and collectivistic cultures, which are characterized by independent and interdependent views of personality, respectively. In individualistic cultures, a person is viewed as an autonomous entity with a distinctive set of traits or attributes that determine behavior. In contrast, in collectivistic cultures, a person is viewed as interdependent with others, and behavior is a consequence of being responsive to one's social roles and relationships. Although Markus and Kitayama (1991) have acknowledged the existence of internal attributes such as personality traits, these attributes are viewed as situation-specific, elusive and unreliable, and not very powerful in predicting behavior. Similarly, Triandis (1995) noted the differential emphasis on personal

[2]Although the distinction between cultural psychology and cross-cultural psychology can be fuzzy (Greenfield, 1997; Triandis, 2000), proponents of the two approaches tend to adopt different perspectives on the likely universality and predictive validity of traits across cultures. Cross-cultural trait psychologists tend to endorse the “psychic unity” of mankind (and the heritability of personality traits) and are relatively optimistic about the possibility of identifying universal personality dimensions and processes (Church, 2000; McCrae, 2000). In contrast, cultural psychologists emphasize the socially constructed nature of personality and self across cultures and are more skeptical about the universality of trait structure and the importance of traits (versus contexts) in the prediction of behavior, at least in relatively collectivistic or sociocentric cultures (Markus & Kitayama, 1998; Shweder & Sullivan, 1993). In the present article, we contrast the trait perspective (applied cross-culturally) with the latter cultural psychology perspective.

traits versus roles and norms in individualistic and collectivistic cultures, respectively, and argued that “personality is less evident in collectivist cultures than it is in individualistic cultures, because the situation is such a powerful determinant of social behavior” (p. 74). Thus, from a cultural psychology perspective, we would expect weaker correlations between trait measures and behavior in collectivistic cultures, as compared to individualistic cultures. In addition, although trait psychologists acknowledge that the behavioral manifestations of traits may differ to some extent across cultures, cultural psychologists would probably expect greater cultural differences in the behaviors predicted by particular traits, because of the greater expected role of situational factors as determinants of behavior. Cultural differences in trait-behavior links could result from cultural differences in the prevalence of various situational contexts or in the extent to which particular situations elicit or afford various traits in different cultures (Morling, Kitayama, & Miyamoto, 2002).

How might researchers compare the behavioral manifestations of traits across cultures? We first consider two methods that we did not use in the present study, then a third method that we did use. First, analyses of differential item functioning (DIF) might allow inferences about cultural differences in the behavioral manifestations of traits. In a personality scale, an item exhibits DIF if respondents with the same level of the trait, but from different cultural groups, do not have the same probability of endorsing the item. To the extent that the item refers to a behavior, the presence of DIF could suggest the existence of cultural differences in the behavioral manifestations of the trait. Several researchers have conducted DIF analyses on personality inventories and reported variable results regarding the proportion of items that exhibit DIF (Butcher, 1996; Chan, 2000; Ellis, Becker, & Kimmel, 1993; Huang, Church, & Katigbak, 1997; Schmit, Kihm, & Robie, 2002; van Leest, 1997). It is important to note, however, that DIF analyses of inventory items may be of limited value for our purposes, because most personality items refer to trait characteristics or general patterns of behavior, rather than to specific acts exhibited during ongoing behavior or over specific time periods (Werner & Pervin, 1986).

A second, and more ideal, approach would be to correlate trait assessments with “online” self or observer reports of behavior, for example, in daily process or experience sampling studies (e.g., Moskowitz & Zuroff, 2004; Wu & Clark, 2003). Although such studies are increasing in frequency, we could not identify any cross-cultural studies of this type, probably due to the expense and difficulty of conducting such studies even within a single culture.

A third method, which is less ideal than observations of ongoing behavior, but better than DIF analyses of trait measures, would be to compare across cultures individuals' retrospective reports of behavioral acts, performed over relatively brief time periods. This is the method used in the present study, in which trait scores from the Revised NEO Personality Inventory (NEO-PI-R; Costa & McCrae, 1992) were used to predict the frequency of specific Big Five acts self-reported during the past month by university students in the United States and the Philippines. Selected elements of the Act Frequency Approach (AFA; Buss & Craik, 1983a) provided a useful framework for our investigation.

Act Frequency Approach (AFA)

The AFA defines traits in terms of the frequency that individuals perform specific behaviors or acts that are prototypical of these traits (Buss & Craik, 1983a, b). While the merits of the AFA have been debated (e.g., Block, 1989; Moser, 1989), we need not endorse all theoretical or procedural aspects of the approach in our attempt to identify specific acts or behaviors that are indicative of particular traits across cultures. For example, not all trait theorists endorse Buss and Craik's view of traits as mere descriptive summaries of behaviors, without causal or explanatory power. One can also question the AFA's reliance on respondents' ratings of the prototypicality of acts for various traits as the sole basis for selecting acts for assessment

purposes, rather than more traditional psychometric criteria such as item-total correlations or external validity. Nonetheless, the AFA has been reasonably successful in delineating acts associated with traits such as dominance, submissiveness, aloofness, gregariousness, impulsivity, social intelligence, creativity, and indeed each of the Big Five dimensions (Amelang, Herboth, & Oefner, 1991; Botwin & Buss, 1989; Buss & Craik, 1983a; Rosero, Luengo, Carrillo-de-la-Peña, & Otero-López, 1994; Willmann, Feldt, & Amelang, 1997). Furthermore, scales constructed by aggregating acts for particular traits into composites have generally correlated well with traditional inventory measures of the traits (Amelang et al., 1991; Angleitner & Demtröder, 1988; Botwin & Buss, 1989; Buss & Craik, 1983a; Rosero et al., 1994). Additional studies have found that act self-reports, although retrospective in nature, can converge with observers' ratings of on-line behavior (Gosling, John, Robins, & Craik, 1998) and retrospective ratings of corresponding traits (Amelang et al., 1991). In the present study, we recognize and address some of the limitations of the AFA, but also view selected aspects of the approach as a promising framework for investigating cultural similarities and differences in the behavioral manifestations of traits.

Previous Cross-Cultural Studies based on the Act Frequency Approach

The AFA originated in the United States, but has also been applied in Germany (Amelang et al., 1991; Angleitner, Buss, & Demtröder, 1990; Borkenau, 1986; Borkenau & Müller, 1992), Spain (Rosero et al., 1994), and China (Willmann et al., 1997). Explicit cross-cultural comparisons have been very rare, however. Only Angleitner et al. (1990), in a study of Germans and Americans, compared both the internal (conceptual) and manifest (self-report) structure of acts across cultures. These researchers found moderate to strong similarity between German and American prototypicality ratings of American-generated acts for most of the traits they investigated. Germans exhibited lower self-reported base rates for the acts associated with each trait category, but the intercorrelation matrices relating act-composite scores for the traits were moderately similar across cultures. No factor analyses were conducted on the acts or act composites to clarify the manifest or self-report structure of the act reports.

Willmann et al. (1997) examined the conceptual structure of Chinese-generated acts for “social intelligence” in small samples of Chinese and Germans. Ratings of the prototypicality of the acts were only modestly similar across cultural groups, leading the authors to conclude that Chinese and Germans have different conceptions of social intelligence. The researchers did not examine self-report act frequency data in either culture. In summary, the existence of only two cross-cultural studies suggests that the AFA approach has been underutilized as a means to investigate cultural differences in the behavioral manifestations of traits.

Overview of the Present Study

To examine trait and cultural psychology perspectives regarding personality prediction of behavior, we sampled one individualistic culture and one collectivistic culture. According to Hofstede (2001) and others, the United States is an individualistic country, whereas the Philippines is relatively collectivistic. For example, in a value-based ranking of 50 cultures, Hofstede (2001) ranked the United States 1st in individualism and the Philippines 31st. The Philippines also ranks highly, relative to the United States, on other dimensions associated with collectivism, including embeddedness (viewing people as embedded in collectives), power distance (acceptance of unequal power in society), and moral discipline (valuing restraint and moderation in the expression of personal desires) (Chinese Culture Connection, 1987; Hofstede, 2001; Schwartz, 1994). Given these differences, a comparison of the United States and Philippines enables a reasonable test of cultural psychology perspectives on trait-behavior relations, which have been cast in terms of the individualism-collectivism distinction.[3]

We used the AFA as a framework for comparing the behavioral manifestations of traits in these two cultures. We began by compiling existing act statements for traits associated with the Big Five dimensions (Angleitner et al., 1990; Botwin & Buss, 1989; Moskowitz, 1994; Wu & Clark, 2003). In so doing, we bypassed two steps that are frequently applied in the AFA, act nomination (i.e., initial generation of acts associated with particular traits) and ratings of the prototypicality of the acts for the designated traits (Buss & Craik, 1983a). This was justified because our primary purpose was to investigate cultural differences in the links between Big Five traits and actual behavior, not the conceptual structure of the acts associated with these traits. A limitation of our approach, however, was that we could not compare the two cultures' indigenous conceptual representations of prototypical acts associated with the Big Five. For example, it is possible that some Big Five acts that are unique to the Philippines were missed.

Because the AFA involves retrospective, not on-line, reports of behavior, one question is whether the personality inventory and act reports are measuring something distinctive. AFA theorists have argued that act composites or “inventories” are intended to serve as behavioral criteria for personality test validation, not as trait measures themselves (Buss & Craik, 1983b). Some support for the distinctiveness of personality inventories and act frequency reports comes from a content analysis of prominent personality inventories by Werner and Pervin (1986). These researchers found that only about 25% of the items in standard personality inventories refer to actual behavior (as opposed to cognitive and affective experiences). Even then, the behavioral items typically refer to general behavior trends, not to specific instances of behavior during specified time periods. In the present study, we first report a similar content analysis of the items in the NEO-PI-R and our act frequency measure, to explicate their differences and strengthen the case that they are measuring something different.

In each culture, we then examined internal consistency reliability and mean inter-act correlations for act composites associated with specific traits within each Big Five domain (e.g., Dominance within the Big Five Extraversion domain). These analyses enabled us to determine whether the diverse behaviors associated with particular traits cohere or co-occur to a similar extent in the two cultures. Buss and Craik (1983a) referred to the degree of act coherence within a trait domain as an index of the “tightness” versus “looseness” of the domain. We next conducted principal components analyses of the act composites to determine whether they have a similar individual-differences (manifest) structure across the two cultures and whether this structure resembles the Big Five dimensions. We examined the ability of the Big Five dimensions, as measured by the NEO-PI-R (Costa & McCrae, 1992), to predict both the derived act components from the principal components analysis and the act composites for specific traits. These analyses could reveal cultural differences in the organization of behavior or in the ability of the Big Five traits to predict behavior.

We next applied multigroup confirmatory factor analysis (CFA) to predict each individual act from all of the Big Five dimensions simultaneously. This enabled us to determine whether the acts were manifestations of single or multiple Big Five traits. Critics of the AFA (e.g., Block, 1989) have argued that many acts are associated with multiple trait categories, while Buss and Craik (1989) have countered that the existence of multidimensional acts does not invalidate the AFA. Consistent with Five-Factor Theory (McCrae & Costa, 1996), some behaviors probably do reflect more than one trait (Angleitner & Demtröder, 1988; Borkenau, 1986; Rosero et al., 1994). Our CFA analysis enabled us to evaluate the extent to which the acts are multidimensional and, if so, whether the same Big Five dimensions predict these

[3]In focusing on the individualism-collectivism (I-C) distinction, we do not mean to imply that the United States and Philippines differ only along this dimension. However, many cultural psychologists continue to view I-C as the most important dimension of cultural differences and focus on the I-C distinction in their theorizing about cultural differences in personality and self (e.g., Greenfield, 1997; Markus & Kitayama, 1991; Triandis, 1995; Triandis & Suh, 2002). See Church (1987) for a more detailed discussion of Filipino culture and personality.

multidimensional acts across cultures. Finally, for relatively unidimensional acts, we employed mean and covariance structures analyses (MACS) in a manner analogous to DIF analyses (Chan, 2000) to identify acts that exhibit cross-cultural comparability versus differences in their relevance or prevalence for each Big Five trait, which would be indicated by significant differences in the regression slopes and regression intercepts, respectively, when predicting the acts from a given Big Five trait.

Our results have potential implications for trait and cultural psychology perspectives on the relation between personality traits and behavior in individualistic and collectivistic cultures. If personality traits predict behavioral acts equally well in the United States and Philippines, it would tend to support trait perspectives over cultural psychology perspectives (Markus & Kitayama, 1998; Triandis, 1995). Some cultural differences in the manifest or self-report structure of acts, or in the relevance and prevalence of specific acts for associated Big Five traits, would not be incompatible with trait perspectives (McCrae & Costa, 1996). However, if these differences were extensive, they would probably be more consistent with cultural psychology perspectives, because such a finding would call into question the universality of trait dimensions and their associated behaviors across cultural contexts.

Method

Sample

United States—The act-frequency measure was completed by 176 college students (123 women, 53 men) from Washington State University. Mean age was 21.9 years (*SD* = 3.8). Most of the participants were third (26%), fourth (46%), and fifth (26%) year education majors. Participants reported the following ethnic backgrounds: Caucasian (*n* = 151, 85.8%), multi-racial (*n* = 8, 4.5%), Chicano/Latino/Hispanic (*n* = 6, 3.4%), Asian/Pacific Islander (*n* = 6, 3.4%), and two or less African American, Native American, or not reporting. Complete and valid NEO-PI-R data was obtained from 169 participants. A total of 157 respondents completed both the act-frequency measure and the NEO-PI-R.

Philippines—The act-frequency measure was completed by 195 college students (115 women, 79 men, 1 not reporting gender) from a large university in Manila (University of Santo Tomas, *n* = 175) and a smaller college in a medium-size city 60 kilometers south of Manila (De La Salle Lipa, *n* = 20). The students were from all year levels and were majoring in Natural Sciences (*n* = 140, 71.8%), Social Sciences (*n* = 36, 18.5%), or Engineering (*n* = 19, 9.7%). Mean age was 18.4 years (*SD* = 1.5). Almost all participants (95.9%) identified their ethnicity as Filipino. Three participants described their ethnicity as Filipino-Chinese, Chinese, or Guiananan, and five did not report their ethnicity. Complete and valid data for the Filipino NEO-PI-R was obtained from 188 participants. A total of 172 respondents completed both instruments.

Instruments

Revised NEO Personality Inventory (NEO-PI-R)—Costa and McCrae's (1992) 240-item NEO-PI-R was used to measure the Big Five traits of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Each domain encompasses six facet scales representing more specific traits. The NEO-PI-R has been translated and validated in over 70 cultures (McCrae & Allik, 2002). We used the Filipino (Tagalog) version (del Pilar, 1998; McCrae, Costa, del Pilar, Rolland, & Parker, 1998), which was previously translated using standard backtranslation methods. Previous studies have demonstrated the generalizability and validity of the NEO-PI-R five-factor model in the Philippine setting (Katigbak, Church, & Akamine, 1996; Katigbak, Church, Guanzon-Lapeña, Carlota, & del Pilar, 2002; McCrae et al., 1998). In the present study, internal consistency (α) reliability estimates for the five domain

scores ranged from .87 to .89 in the United States and from .79 to .91 in the Philippines. Alpha estimates for the facet scales ranged from .54 to .80 in the United States and from .40 to .77 in the Philippines.

To evaluate measurement equivalence across the two cultures we conducted confirmatory factor analyses (CFA) and mean and covariance structures (MACS) analyses with the Big Five dimensions as latent variables, each defined by their six respective facet scales. We used the AMOS 4.0 program to conduct all CFA and MACS analyses in this study. We tested alternative CFA and MACS models in which factor loadings, correlations among the Big Five dimensions, and the facet scale intercepts were constrained to be equal across cultures. These analyses indicated that an oblique model, in which the Big Five latent dimensions were allowed to correlate, fit the data better than an orthogonal model ($\Delta\chi^2[18] = 282.73$, $p < .01$). The final model fit the data fairly well ($\chi^2/df = 3.04$, CFI = .95, RMSEA = .08) and was largely invariant across cultures. The minimal departures from invariance included the following: (a) one Big Five correlation (Conscientiousness versus Openness to Experience) was noninvariant and thus freely estimated in the two cultures, while the remaining nine Big Five intercorrelations were constrained to equality across cultures without significant loss of model fit ($\Delta\chi^2[9] = 21.57$, $p > .01$); (b) factor loadings for all facets on their respective Big Five dimensions were constrained to equality across cultures, but the O6: Values facet was deleted because it did not have a statistically significant loading in the Philippine sample; and (c) 5 of 30 facet intercepts had to be freely estimated rather than constrained to equality across the two cultures. Four residual covariances between facet error terms were included to improve model fit but were not constrained to equality across cultures because such constraints are viewed as too stringent (Byrne, 2001).

Act-frequency measure—We administered a 198-item act-frequency measure, which was titled Behavior Questionnaire for respondents. Participants provided demographic information, then indicated their frequency of doing each act in the past month using a 5-point scale (never, rarely, sometimes, often, and very often). We judged that a one-month time frame would provide respondents sufficient opportunity to perform many of the acts, while maintaining fairly accurate recall. In previous AFA studies, respondents have typically rated their frequency of doing the acts at any point in the past, that is, with no time frame specified (e.g., Amelang et al., 1991; Borkenau, 1986; Buss & Craik, 1983a). Alternatively, time periods of longer than one month have been specified (e.g., three months; Botwin & Buss, 1989). Longer time frames raise greater concerns about recall accuracy and could make the behavior ratings less distinctive from trait ratings.

We selected Big-Five-related acts that had been successfully used in previous studies, which included acts from the following sources and categories: (a) for Extraversion: Botwin and Buss' (1989) Extraverted, Introverted, Dominant, and Submissive categories; Moskowitz' (1994) Dominance and Submissive categories; and Angleitner et al.'s (1990) Gregarious, Aloof, Dominant, and Submissive categories; (b) for Agreeableness: Botwin and Buss' Agreeable, Quarrelsome, Warm, and Cold categories; Moskowitz' Agreeableness and Quarrelsomeness categories; Angleitner et al.'s Agreeable and Quarrelsome categories; and Wu and Clark's (2003) Aggression category; (c) for Conscientiousness: Botwin and Buss' Conscientious, Unconscientious, Responsible, and Irresponsible categories; and Wu and Clark's Failure to Plan (reverse-keyed as Planful) and Carefree/Spontaneous categories; (d) for Neuroticism: Botwin and Buss' Emotionally Stable, Emotionally Unstable, Secure, and Insecure categories; and (e) for Openness to Experience: Botwin and Buss' Intelligent, Stupid, Cultured, and Uncultured categories.

The Botwin and Buss (1989) items were modified from the third person to the first person for self-report use and some items were adapted to eliminate situational references (e.g., the act

"Went to the bar to socialize" was changed to "Went out to socialize"). This was done because we intend to use these acts in future studies of cross-situational consistency, in which participants will indicate the situation(s) in which they performed the acts (e.g., at home, at work, etc.). We reversed the direction of a few acts to make them more understandable and moved them to the opposite act composite (e.g., from Emotional Stability to Instability).

A content mapping of the preliminary act list onto the facets of the NEO-PI-R indicated that some aspects of each Big Five domain were over-represented or under-represented. Therefore, we reduced the number of acts associated with some facets and wrote new acts for the under-represented facets. The goal was more uniform coverage of all aspects of each Big Five domain, which might improve the content validity of the act list. In the Results section, we refer to the new acts as supplemental acts within each Big Five domain. Overall, 22% of the 198 final acts were new. Two Tagalog-English bilinguals derived a Filipino (Tagalog) version of the act-frequency measure using standard backtranslation procedures. Sample acts are shown in Tables 6, 7, and 8.

Procedure

In the Philippines, research assistants administered the two instruments to volunteers in two class sessions, separated by one week. In the United States, research assistants handed out the instruments to volunteers in two class sessions, separated by one week, and the participants completed the instruments outside of class and returned them for pick-up one week after distribution. Participants in the United States sample received extra credit points. In both cultures, the order of administration of the instruments was counterbalanced.

Results

Content Analysis of the NEO-PI-R and Act Frequency Measures

The first two authors independently coded each of the NEO-PI-R and act items using a slightly adapted version of Werner and Pervin's (1986) category system (see appendix).[4]Table 1 shows the level of coder agreement, expressed as raw proportions (P) and Kappa coefficients, which correct for chance agreement. Coder agreement was generally good for both instruments. In Table 1, we also show the average of the two coders' proportions for each category. There were important differences between the NEO-PI-R and act items for several coding categories. As expected, the vast majority of the acts (85% based on the average of the two judges) in the act-frequency measure refer to actual behaviors. Almost all of the remaining acts (13%) refer to affective-feelings associated with the Neuroticism domain. In contrast, only 16% of the NEO-PI-R items refer to behaviors. Instead, most of the NEO-PI-R items are distributed among the cognitive and affective areas of functioning, especially self-cognitions. About 16% of the NEO-PI-R items, but none of the acts, make specific reference to traits. A majority of both the NEO-PI-R and act items make no reference to situational context. Not surprisingly, frequency references (e.g., usually, rarely) were rare in the acts because they aim to address single, point-in-time behaviors. In contrast, frequency references are more common in the NEO-PI-R items (32%) and serve to strengthen the dispositional nature of the thoughts, feelings, and actions to which they refer. Finally, the most obvious difference between the NEO-PI-R and act items involved the time-frame dimension. Reference to a specific time frame is very rare in the NEO-PI-R items, whereas all of the act items were coded as "past" time frame because respondents rated how often they performed these behaviors during the past month.

[4]In coding time reference, Werner and Pervin included only past, present, and future categories. However, the approximately 85% of items they coded as referring to the "present" actually make no explicit time reference (e.g., "I am daring."). Werner and Pervin treated such items as respondents' present statements or views about themselves. However, if they made no specific reference to the present time frame (e.g., currently, at the moment), we treated these items as having no explicit time reference. Indeed, they could just as well refer to past, present, or enduring self-views.

In summary, the content analysis clarifies the differences between the personality inventory and act items and shows that they are measuring something different. The vast majority of the acts refer to specific behaviors conducted during a specific time frame (i.e., the past month). In contrast, for the personality items, references to actual behaviors are infrequent and references to specific time frames are rare. Instead, the personality items refer extensively to cognitions and affects, and make greater use of frequency qualifiers and unspecified time frames that enhance their dispositional nature.

Manifest Structure of Big Five Acts

Reliability of act composites—We scored 31 act composites by averaging the ratings across all acts associated with the same trait (see Table 2). We combined categories with the same or similar label in the source studies. As examples, Dominant acts from the studies by Botwin and Buss (1989) and Moskowitz (1994) were combined into a single composite, and Angleitner et al.'s (1990) Gregarious acts were combined with Botwin and Buss' Extraversion acts. The Supplemental composites in Table 2 were comprised of the new acts written for this study. Table 2 shows the α reliabilities and mean inter-act correlations (MICs) for the act composites in each culture. The α reliabilities were lower than those reported in retrospective act-frequency data by Botwin and Buss (mean α = .78), because the number of acts in their composites was substantially larger (typically 15). Thus, the MICs provide a more appropriate comparison standard. Botwin and Buss reported a mean MIC of .22, which is essentially identical to the mean MICs in our American and Filipino samples. The Supplemental act composites generally had below average MICs, because they contained more heterogeneous acts within a Big Five domain, rather than acts for a specific trait such as dominance or responsibility. Only the Supplemental Agreeableness composite was excluded from subsequent analyses because its acts did not cohere at all in the Philippine sample (α = .06, MIC = .02). With a few exceptions, the alpha reliabilities and MICs were similar in the American and Filipino samples, suggesting that the behaviors associated with particular traits cohere or co-occur to a similar degree in the two cultures.

Factor structure of act composites—Following Botwin and Buss (1989), we used principal components analysis to investigate the manifest structure of the act composites. In a preliminary analysis, the principal components were not bipolar (e.g., the Dominant and Submissive composites did not load on opposite poles of a component). Rather, almost all of the act composites loaded positively on the first unrotated principal component. This suggested that the covariation among the act composites was accounted for, in part, by individual differences in overall activity level or response biases in responding to Likert-type scales. This phenomenon is common in act frequency studies and researchers have usually statistically controlled for individual differences in total act endorsement (e.g., Botwin & Buss, 1989; Moskowitz, 1994). We did so as well for the principal components analysis, using the same procedure as Botwin and Buss.

Assuming that the first unrotated principal component represents the variance attributable to total activity level or response bias, we regressed each act-composite score onto factor scores for the first unrotated principal component. The resulting residualized act-composite scores in each culture are thus independent of total activity level or response bias. We then conducted a principal components analysis on these residualized composite scores, focusing on whether the 5-component solutions would produce dimensions interpretable as the Big Five. The first 10 eigenvalues in the American sample were 6.22, 3.48, 2.26, 1.96, 1.41, 1.32, 1.20, 1.09, .98, and .91 and the first five components accounted for 51% of the variance. The first 10 eigenvalues in the Philippine sample were 7.20, 3.33, 2.64, 1.51, 1.40, 1.09, 1.00, .92, .88 and .82 and the first five components accounted for 54% of the variance. In the Philippine sample, the five components were indeed interpretable as the Big Five dimensions. In the American

sample, we labeled the five components as follows: (a) Conscientiousness; (b) Warm Affiliation, a blend of Agreeableness and Extraversion composites, but excluding Dominant and Submissive; (c) Openness to Experience; (d) Dominance versus Submissiveness; and (e) Neuroticism. The American components defined by the Agreeableness and Extraversion act composites were rotational variants of the Philippine factors, so we rotated the American varimax solution to the Philippine varimax solution using a Procrustes rotation.

Table 3 shows the resulting component matrices in the two cultures. Each of the five components, which we labeled Conscientiousness, Agreeableness, Neuroticism, Extraversion, and Openness to Experience, is well-defined, with only a few exceptions, by the intended act composites. The few unexpected loadings also make substantive sense. For example, the loading of the Stupid composite on the Conscientiousness component, rather than Openness to Experience, is sensible because the three items in this composite reflect responsibility, competence, and self-discipline (i.e., doing poorly on an exam or assignment, failing to grasp an explanation, turning in an assignment late). As another example, the better loading of the Secure composite on the Agreeableness component than on Neuroticism in both cultures is sensible because it contains humble acts about discussing one's emotions with others and being willing to admit mistakes or weaknesses. The Secure composite had a secondary loading on the Agreeableness component in Botwin and Buss' (1989) study. Despite a few cultural differences in loading patterns for specific act composites, the overall cross-cultural convergence of the manifest structure was fairly good. Haven and Ten Berge (1977) have suggested that factor congruence coefficients of .85 or higher indicate factor similarity. As seen in the last row of Table 3, all five components met this standard.

Table 4 shows the correlations between the factor scores for these five act components and the NEO-PI-R domain scores. The convergent correlations on the matrix diagonals provide some additional support for our Big Five labeling of the act components, with the primary exception of the Openness to Experience component in the Philippine sample (which was defined by a small number of act composites). The convergent (diagonal) correlations were significantly higher in the United States than in the Philippines for Neuroticism ($z = 2.73$, $p < .01$), Extraversion ($z = 2.10$, $p < .05$), and Openness to Experience ($z = 2.73$, $p < .01$). However, these correlation differences could be due, in part, to the lower congruence of these three components across the two cultures, rather than cultural differences in the strength of trait-behavior relations. Overall, our principal components results provide evidence that acts intended to reflect the Big Five traits do indeed exhibit a manifest structure that (a) resembles the Five-Factor Model, and (b) is similar, although not identical, across cultures.

Big Five Prediction of Act Composites across Cultures

To compare the ability of the Big Five traits to predict act composites in the two cultures, we regressed the original (non-residualized) act composites onto the NEO-PI-R Big Five domain scores separately (with Pearson correlations) and simultaneously (with multiple regression analyses). Table 5 shows the Big Five domain that correlated most highly with each act composite and the multiple correlation obtained when all Big Five dimensions predicted the act composite. For example, the Dominant act composite was predicted best by Big Five Extraversion (E) in both cultures ($r = .30$ in the United States; $r = .49$ in the Philippines), and was predicted simultaneously by all of the Big Five dimensions somewhat better in the Philippines ($R = .57$) than in the United States ($R = .48$).

There were some cultural differences in the ability of the Big Five traits, separately or simultaneously, to predict particular act composites. For 4 of the 30 act composites (Aloof, Carefree/Spontaneous, Emotionally Stable, and Intelligent), the best Big Five predictor differed across cultures, although secondary correlations (not shown in Table 5) were consistent with the primary correlation in the other culture. Most important for our purposes

was that the ability of the Big Five traits to predict the act composites differed little, on average, across the two cultures. The mean absolute values of the Pearson correlations in the United States (M = .40) and in the Philippines (M = .46) were not significantly different (z = .73, p > .05). The means of the 30 multiple correlations in Table 5 were also quite similar across the two cultures. Thus, these results provide little support for the cultural psychology hypothesis that trait-behavior relationships are stronger in the (individualistic) United States than in the (collectivistic) Philippines.[5]

Big Five Prediction of Specific Acts across Cultures: Multicategory Analyses

To determine whether specific acts (not act composites) reflect single or multiple Big Five traits, we used multigroup confirmatory factor analysis (CFA) to predict each act, one at a time, from all of the Big Five dimensions simultaneously. The original (non-residualized) act frequency scores were again used for these analyses. The Big Five dimensions were measured using the final oblique NEO-PI-R model described in the instrument section, which was largely invariant across the two cultures. We were interested in the dimensionality of each act in each culture separately, so we freely estimated (rather than constrained to equality) the five path coefficients relating the latent Big Five dimensions to the act in each culture. An act was treated as multidimensional in one or both cultures if more than one of the five path coefficients relating the Big Five traits to the act was statistically significant (p < .05).

By this standard, 69% of the 198 acts were multidimensional in one or both cultures. Typically, two or three Big Five dimensions predicted a given act, although in a few cases four or five dimensions had significant path coefficients in one or both cultures. For multidimensional acts, it was rare that all of the *same* Big Five dimensions predicted the act in both cultures, but the dominant predictor was often the same across cultures.[6] Unidimensional or single-category acts (i.e., acts significantly predicted by only one Big Five dimension) were much less common, comprising only 27% of the total acts (acts predicted by one dimension in one culture and no dimension in the other culture were included in this percentage). Only 9% of the acts were both unidimensional and predicted by the *same* Big Five dimension in the two cultures. For 4.5% of the acts, no Big Five dimension was significantly predictive in either culture.

Some examples of multicategory acts illustrate that most, if not all, of these multidimensional relationships are probably meaningful. For example, several Extraverted and Dominant acts that were predicted by Big Five Extraversion, as expected, were also negatively associated, to a lesser extent, with NEO-PI-R Agreeableness in both cultures (e.g., talked a lot, entered into a conversation with a group I didn't know, expressed my own opinion). Such acts probably reflect the socially potent or assertive aspects of extraversion, which can also be somewhat disagreeable in both cultures. As a second example, the act “spent some time gossiping” was predicted by Extraversion and to a lesser extent Neuroticism in both cultures. It was also modestly related to Agreeableness (inversely) in the American sample only. It makes sense that extraverted individuals, who spend more time socializing with others, will gossip more frequently. However, frequent gossiping can also reflect attempts to compensate for low self-esteem and insecurity through denigration of others (i.e., neuroticism). At least in the American sample, gossiping may also be a disagreeable tendency. These examples are only illustrative, but suggest that the multidimensionality that characterizes many acts is probably meaningful and informative, although not ideal for assessment purposes.

[5]When we conducted the same analyses using the residualized act composite scores we obtained similar results. The mean absolute value of the correlations relating the act composites to the best Big Five predictor was the same in the two cultures (Mean r = .41), and the mean multiple correlations were essentially identical in the two cultures (.50 in the United States; .49 in the Philippines).

[6]Because the Philippine sample was slightly larger than the United States sample, we considered whether some of the cultural differences in significant predictors might be due to greater statistical power in the Philippine sample. However, we obtained similar results when we considered a standardized path coefficient of .20 or greater in absolute value to be the cut-off for considering a Big Five dimension to be a predictor of an act, rather than the statistical significance of the path coefficient.

Cultural Differences in the Relevance and Prevalence of Specific Big Five Acts

The presence of secondary path coefficients in the CFA analyses reported in the previous section does not necessarily preclude an act from being treated as a primary indicator of a particular Big Five dimension. For many multidimensional acts, the path coefficient for a particular Big Five dimension was clearly larger than the secondary path coefficients for other Big Five dimensions. To identify primary indicators of each Big Five dimension, we identified acts for which the primary path coefficient was .30 or greater in absolute value and at least .10 higher than all other path coefficients. This criterion is to some extent arbitrary, but is comparable to cut-offs typically used in selecting items for a test based on item-total correlations. We identified 87 such acts (44% of the original 198 acts) in the United States sample and 91 such acts (46%) in the Philippines. Taking into account the overlap between these two lists, there were 129 unique acts (i.e., 65% of the original 198 acts) that met our criterion as a primary indicator of a single Big Five dimension in one or both cultures.

We formally tested for cultural differences in the trait relevance and prevalence of these 129 acts by conducting MACS analyses in a manner analogous to DIF analyses (Chan, 2000). In each analysis, the relevant Big Five dimension was treated as a latent variable measured by the six NEO-PI-R facet scores for that dimension. For each of the 129 acts, we first tested a model in which the path coefficient relating the relevant Big Five dimension to the act was constrained to be equal across the two cultures. If the modification index (MI) associated with this constrained path (i.e., regression slope) was statistically significant (MI = 4 or greater, $p < .05$), it meant that the behavior referred to in the act statement was not equally relevant as an indicator of the Big Five trait in the two cultures.[7] In this case, the path coefficients (i.e., regression slopes) were then freely estimated in the two cultures. If the MI for the constrained regression slope was not statistically significant, a second model was tested in which the intercept for the act was constrained to be equal across cultures. If the MI associated with the intercept was statistically significant (i.e., MI = 4 or greater, $p < .05$) it meant that the behavior referred to in the act statement was not equally prevalent or reported with comparable frequency for given levels of the trait in the two cultures. Differences in regression slopes are of particular interest because they point to cultural differences in the ability of Big Five traits to predict specific behaviors, that is, cultural differences in the behavioral manifestations of Big Five traits. Cultural differences in the intercepts are also of interest, because they may reveal differences in the cultural prevalence or affordance of particular trait-relevant behaviors.

Tables 6 through 8 summarize the results of the MACS analyses. Culture-equivalent acts, which are listed in Table 6, met the following criteria: (a) if they were multidimensional in our earlier multicategory analyses, the path coefficient (regression slope) for the primary Big Five dimension was at least .10 higher in absolute value than the path coefficients for all other Big Five traits; (b) the regression slopes relating the primary Big Five dimension to the act in the present unidimensional analysis had to be at least .30 in both cultures; and (c) both the regression slopes and act intercepts for the primary Big Five predictor could be considered equal in the two cultures (i.e., MI < 4 when constrained to equality across cultures). As seen in Table 6, only 20 acts met all of these criteria. These 20 acts were both equally relevant and equally prevalent indicators of the respective Big Five traits in the two cultures. In contrast, Table 7 shows acts that were equally relevant indicators of their respective Big Five dimensions, but were more prevalent (i.e., reported more frequently) in one or the other culture for a given level of the trait. The estimated act intercepts in Table 7 show which cultural sample reported the act more frequently, on average, than the other, as reflected in higher intercept

[7]The modification indices (MIs) provided by AMOS 4.0 are estimates of the change in χ^2 value that will occur if the relevant parameter (e.g., regression slope or intercept for the act) is freely estimated in both cultures rather than constrained to be equal. Thus, if MI > 4, it indicates that a χ^2 difference test, with 1 degree of freedom, will find the model with the freely estimated parameter to be significantly better than the model in which the parameter is constrained to be equal across cultures.

values. Finally, Table 8 shows the small number of acts that were definitively less relevant as indicators of their respective Big Five dimensions in one culture versus the other. These were acts that were good indicators of a primary Big Five dimension in one culture but not the other (or in one case related to the Big Five dimension in the opposite direction). There were no such acts in the Agreeableness and Openness to Experience domains.

Tables 6 through 8 encompass only 50 of the 129 acts included in our unidimensional MACS analyses. The remaining 79 acts either: (a) had culture-equivalent regression slopes that were less than .30 in one or both cultures (i.e., they were relatively weak indicators of the Big Five traits); or (b) exhibited cultural differences in regression slopes or intercepts that were not large enough to be statistically significant given our sample sizes. Thus, the acts listed in Tables 6 through 8 represent the most definitive cases of culture-equivalence (Table 6) and cultural differences in act prevalence (Table 7) or act relevance (Table 8).

Previous researchers have lamented the difficulty of explaining the instances of cultural bias identified in DIF analyses (Ellis, 1990; Engelhard, Hansche, & Rutledge, 1990; Huang et al., 1997). Similarly, we should not expect to be able to explain all of the cultural differences in act prediction identified here. Indeed, some interpretations may be speculative. Therefore, we note only several examples of how these acts might provide clues to cultural similarities and differences in act relevance and prevalence for Big Five traits.

In the Extraversion domain, most of the definitive cases of culture-equivalent acts refer to gregariousness, positive emotions, and warmth, but not to assertiveness, activity, or excitement-seeking (see Table 6). This suggests that behaviors reflecting warm and cheerful sociability represent the most generalizable manifestations of extraversion across these two cultures. Poortinga, van de Vijver, and van Hemert (2002, p. 289) have commented that the assertiveness, activity, and excitement-seeking items in the NEO-PI-R Extraversion scale suggest a “dominant manager” more than of a person who enjoys the presence of others. Our results suggest that “dominant manager” acts may be a less universal aspect of extraversion across cultures. The Extraversion acts in Table 7 exhibited significant cultural differences in regression intercepts, revealing that Americans reported more frequent socializing and smiling at strangers, whereas Filipinos reported more frequent experiencing of cheerful emotions and tendencies to initiate interactions with shy or new persons. Some of these results may reflect the tendency of Filipinos to maintain a pleasant disposition, while being more guarded with strangers or outgroup members (Church, 1987). Two acts listed under Extraversion in Table 8 were intended to reflect insecurity (“asked for approval and acceptance from my friends”) and submissiveness (“gave in to what someone else wanted”) in the United States (Botwin & Buss, 1989;Moskowitz, 1994), but were manifestations of Extraversion in the Philippines. These differences might be accounted for by the Filipino value of *pakikisama*, which refers to going along with others in order to maintain smooth interpersonal relations and be socially accepted (Lynch, 1973). In the Philippines, acceding to others' wishes and seeking social acceptance are plausible indicators of extraversion or sociability, rather than insecurity and submissiveness.

In the Agreeableness domain, the most definitive culture-equivalent acts refer to disagreeable behavior—arguing and criticizing others, hurting others' feelings, and making decisions without consultation (see Table 6), despite the fact that many positive Agreeableness acts were included in our act list. At least for these two cultures, disagreeable behaviors may be more common indicators of this trait than agreeable behaviors. In the few definitive instances of differential prevalence of Agreeableness acts, Americans reported more frequently hurting others' feelings or persuading others to do something they did not want to do (Table 7). This difference might again reflect the Filipino emphasis on avoiding conflict and maintaining smooth interpersonal relations (Church, 1987;Lynch, 1973).

In the Conscientiousness domain, culture-equivalent acts refer to being orderly, planful, and punctual, and to setting a high standard for the quality of one's work (Table 6). For Conscientiousness acts that exhibited differential prevalence (see Table 7), Americans consistently reported performing such behaviors more frequently, which might reflect greater concern about academic performance among American students. For example, Church and Katigbak (1992) found that American university students ranked grades orientation and achieving motives (setting high performance standards) higher than did Filipino university students.

In the Neuroticism domain, a range of acts involving stress and coping, self-consciousness or self-abasement, and moodiness were culture-relevant indicators (Tables 6 and 7). In the definitive instances of differential prevalence (Table 7), Americans reported more frequently experiencing anxiety about undone work, complaints about problems, and moodiness. Inversely, Filipinos reported more frequently taking setbacks in stride without getting upset. These results suggest that Americans may be more anxious about school work and more assertive about complaints. In contrast, Filipinos have been described as valuing endurance and a pleasant demeanor, and may be better able to adopt an attitude of optimistic fatalism about their difficulties (Church, 1987;Lagmay, 1993). These cultural features might also help to explain why acts about guilt feelings, concentration problems, apologizing for minor mistakes, and worrying about things that are beyond control were less relevant indicators of Neuroticism in the Philippines than in the United States (see Table 8).

Discussion

We applied aspects of the Act Frequency Approach (AFA) to investigate cross-cultural similarities and differences in the behavioral manifestations of Big Five traits. From a theoretical perspective, the research is important because it allows conclusions about the equivalence of traits across cultures and the viability of the trait perspective for studies of culture and personality. The research also has applied significance because the cross-cultural equivalence of the behavioral manifestations of traits has implications for the measurement equivalence and predictive validity of trait measures across cultures. Although not a primary goal, the study also addressed the utility of selected aspects of the AFA, which has rarely been applied in cross-cultural studies. Finally, the research is relevant to the debate between trait and cultural psychologists regarding the utility of traits in behavioral prediction across cultures (Church, 2000; Markus & Kitayama, 1998; McCrae, 2000; Triandis, 1995).

Several findings provided support for trait perspectives, and for the AFA as a method for investigating trait-behavior relationships. First, the mean inter-act correlations (MICs) for the act composites were very similar across the two cultures, despite the fact that the acts originated in the United States context. This suggests that trait-related behaviors cohere to a similar degree in the American and Filipino cultures. Second, act composites for specific traits (e.g., Dominance, Responsibility) associated with the Big Five domains exhibited a manifest (self-report) structure that corresponded fairly well to the Big Five domains and was similar across cultures. That is, the organization of behavior, at least in retrospective self-reports, was similar, although not identical, across the two cultures. Finally, and most important, trait measures were able to predict both individual acts and act composites to a similar degree, overall, in both an individualistic culture (the United States) and a collectivistic culture (the Philippines). On average, the Big Five dimensions, individually and simultaneously, predicted 30 act composites equally well in the two cultures. In addition, we identified almost the same number of individual acts in the two cultures that had primary regression slopes of similar size with particular Big Five dimensions. In summary, there was little, if any, evidence that trait measures predict behavioral acts better in the United States than in the Philippines, at least when retrospective act reports are used.

Overall, these results are more consistent with trait perspectives than with cultural psychology perspectives regarding the overall strength of relationships between traits and behavior. As reviewed earlier, cultural psychologists expect weaker relationships overall between traits and behavior in collectivistic cultures than in individualistic cultures, because of the greater expected role of contextual factors as a determinant of behavior in the former cultures (e.g., Markus & Kitayama, 1998; Triandis, 1995). Of course, our investigation involved only one individualistic and one collectivistic culture, so our results need to be replicated in additional cultures. In addition, we addressed only one aspect of cultural psychology perspectives on personality traits across cultures. Cultural psychologists have made a number of additional predictions regarding the differential salience or role of traits across cultures, for example, as an aspect of self-concept and in behavioral inference. Some support for these predictions has been found, particularly in comparisons of the United States with East Asian cultures (e.g., Heine, 2001; Kanagawa, Cross, & Markus, 2001). It should also be noted that we did find cultural differences in this study, which included (a) differences in the size of the predictive relationships between particular Big Five traits and act composites; and (b) differences in the ability of multiple and individual Big Five dimensions to predict specific acts. We do not intend to imply that there were no cultural differences in specific trait-behavior relationships. However, there was little evidence of weaker trait-behavior relationships overall in the Philippines, as compared to the United States.

One important finding was that the majority of the specific acts were multidimensional (i.e., multicategory acts). They were significantly predicted by more than one, and often two or three, Big Five dimensions. This result is consistent with studies in which the prototypicality of acts has been judged for multiple trait categories. These studies have consistently found that many acts are judged to be prototypical of more than one trait category (Angleitner & Demtröder, 1988; Borkenau, 1986). On the one hand, the multidimensionality of acts can be viewed as a serious challenge for the AFA, suggesting that many acts may have been misclassified or are ambiguous indicators of traits (Block, 1989). On the other hand, the multidimensionality of acts may not be surprising given the complexity of behavior. In the Results section, we provided examples to illustrate that the multidimensionality of specific acts or behaviors may be meaningful and informative. In this interpretation, the multidimensionality of acts is not so much a flaw of the AFA, but an accurate reflection of the reality of behavior. Indeed, the multidimensionality of behavior in terms of the Big Five traits is predicted by Five-Factor Theory (McCrae & Costa, 1996). Nonetheless, from the perspective of traditional psychometrics, multidimensionality is not ideal for assessment purposes. Buss and Craik (1989) and Angleitner and Demtröder (1988) have suggested that multidimensional acts can be used to assess multiple dimensions. However, this would result in overlapping items across scales and would be inconsistent with traditional test construction goals of maximizing internal consistency and discriminant validity. Proponents of the AFA approach have described the empirical correlations among the acts in a given trait category (i.e., their internal consistency) as irrelevant for act selection (although the mean inter-act correlations are used to provide information on the coherence of the acts associated with a given trait). Nonetheless, a more promising approach may be to go beyond the use of prototypicality ratings alone in the selection of acts, by also applying traditional psychometric criteria such as item-total correlations and external validity with relevant trait measures.

One innovation of the present study was the use of mean and covariance structures (MACS) analyses to investigate cultural similarities and differences in the trait relevance and prevalence of specific behaviors or acts. There were some limitations of these analyses. Individual acts are, of course, less reliable than act composites. However, if one wishes to identify cultural differences in the specific behavioral manifestations of particular traits, one will need to investigate specific behaviors or acts across cultures. In addition, as previous DIF studies have noted (e.g., Huang et al., 1997), one is not always able to explain with confidence why particular

items or acts exhibit cultural differences. Nonetheless, these analyses did provide potential clues about the kinds of behaviors that generalize best as indicators of Big Five traits across cultures and where cultural differences might emerge. The example interpretations we offered for cultural differences in act relevance and prevalence were plausible, but must be viewed as somewhat speculative. Such interpretations would need to be confirmed in subsequent studies by incorporating additional acts of the types that exhibited cultural similarities and differences. In the meantime, the present study can serve as an illustration of how researchers might go about investigating cultural similarities and differences in the behavioral manifestations of particular traits.

Two other limitations of the study should be noted. First, we did not implement a comprehensive AFA in both cultures, which would have involved deriving indigenous acts for each trait in the Philippines as well. It is conceivable that the manifest structure of acts, or the ability to predict act composites from traits, would have differed more across cultures if we had first identified Philippine-specific acts or used indigenous Philippine inventories. Some evidence argues against these possibilities, however. Katigbak et al. (1996) investigated the indigenous structure of Filipino personality using a large item pool based on situational behaviors (similar to acts) provided by Filipino informants. The derived dimensions—Social Potency, Concern for Others, Responsibility, Affective Well-being, Emotional Control, and Broad-Mindedness—resembled the Big Five dimensions, suggesting that indigenous Philippine acts also exhibit a manifest structure resembling the Big Five dimensions. In addition, Katigbak et al. (2002) showed that indigenous Philippine trait measures and the imported NEO-PI-R predicted Filipino college students' self-reported behaviors (e.g., smoking, drinking, gambling) about equally well.

Second, and most important, we investigated retrospective reports of recent behaviors, rather than the on-line, momentary behaviors that are recorded in daily process or experience sampling studies. The trait-behavior distinction we sought to capture is weakened to the extent that the NEO-PI-R and act items measure the same thing, or if participants' responses to the two instruments reflect similar reconstructive appraisal processes. To address these concerns, we conducted a content analysis and showed that the act items are much more behavioral than the NEO-PI-R items and involve assessments of specific behaviors during a specific and relatively short time frame. In contrast, like other personality inventories (Werner & Pervin, 1986), the NEO-PI-R assesses a broader range of areas of functioning, including predominantly cognitions and affects, and uses frequency references and unspecified time frames to assess enduring dispositions. Thus, the content of the trait and act assessments can be distinguished in important ways.

Nonetheless, the fact that respondents were not rating their momentary behaviors introduces questions about recall accuracy and whether similar self-appraisal processes might be involved in completing the NEO-PI-R and act measures. Previous studies have reported only modest to moderate agreement between momentary and retrospective reports of mood, pain, or coping (e.g., Stone, Schwartz, Broderick, & Shiffman, 2005; Stone et al., 1998). It is possible, however, that retrospective recall is more accurate for observable behaviors than for such subjective states. Gosling et al. (1998) reported moderate accuracy in short-term retrospective reports of interpersonal behaviors in a group discussion using observer ratings of videotapes as the criterion. Agreement varied across different types of acts and depended on such act properties as observability, base rate, desirability, and Big Five domain. Researchers have also suggested that retrospective reports may reflect respondents' general heuristics or schemas for reconstructing events, as well as their current appraisals of the events (Levine, Prohaska, Burgess, Rice, & Laulhere, 2001; Stone et al., 1998). We sought to minimize such factors by emphasizing readily observable behaviors and by limiting the recall period to the past month (rather than the unspecified or 3-month periods used in previous act frequency studies).

Nonetheless, respondents' act frequency reports were probably not immune to such factors, in which case, the results of the present study could reflect, in part, cultural commonalities and differences in self-appraisals of recent behavioral tendencies associated with the Big Five dimensions.

In subsequent studies, researchers should apply experience sampling studies to investigate cultural differences in trait-behavior relationships in ongoing daily behavior. We could identify no such studies in the current cross-cultural literature. The present study illustrated the data analytic techniques that could be applied to such data to identify cultural similarities and differences in the relevance and prevalence of the behavioral manifestations of personality traits. If cultural psychologists are correct that contextual factors are more important than traits as determinants of behavior in collectivistic cultures, we would expect greater cross-cultural differences in trait-behavior relationships in experience sampling studies than were found in the present study. In retrospective ratings, respondents may average over situational contexts, whereas the impact of contextual factors on behaviors would be more immediate in ongoing daily behavior. In the meantime, the results of the present study suggest that the Big Five traits predict relevant acts or behaviors about equally well in the United States and Philippines, supporting trait psychology perspectives, but that cultural differences in the specific behavioral manifestations of traits can also be identified.

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Appendix: Coding Categories for NEO-PI-R and Act-Frequency Items (adapted from Werner & Pervin, 1986)

A. Area of Functioning

Cognitive-self: Description of self or beliefs about the self (e.g., “I am a moral person,” “I think about…”). Also separately designate as a Trait reference if the item describes a general trait (e.g., “I am a moral person,” “I am always honest”).

Cognitive-beliefs, attitudes, values, opinions, including beliefs about others (e.g., “People have it in for me,” “Others are glad to see me,” “I am known for…,” “I believe….”)

Affective-preferences: Likes, dislikes, wishes (e.g., “I like to bowl,” “I would rather…,” “I enjoy…”).

Affective-feelings: Reports of feelings; includes items on nightmares and dreams (e.g., “I get anxious a lot,” “I am often depressed”).

Behavioral: Actual action, behavior, activity (e.g., “I often spend time gardening” “).

B. Situation

No specification or weak/vague/unclear specification: (e.g., “People are nice to me,” “I am often anxious”).

Clear specification of setting or context (e.g., where or when) (e.g., “I get depressed at school,” “I get anxious before an exam,” “I get anxious when I make a bad mistake”).

C. Frequency

No specific reference or uncertain reference: (e.g., "I am an anxious person"); or *Unclear if frequency, intensity, or both*: (e.g., "I am easily downed in an argument").

General or specific reference: (e.g., "I am depressed much of the time," "I rarely …," "Generally, I ….")

D. Time

No time reference; includes descriptions of enduring traits: (e.g., "I am daring").

Past: (e.g., "There have been times when…" "I have always…" "In the past…").

Present; includes present states: (e.g., "Presently, I …..," "At the moment, I….").

Future: (e.g., "I hope to become a doctor" ") or *Hypothetical* (Reference of notions like *if*, *would*, and *might*): (e.g., "If attacked I am likely to fight back," "I could live alone…").

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Table 1

Content Analysis of NEO-PI-R and Act-Frequency Items

	Coder agreement				Average proportions per category	
	NEO-PI-R		Acts			
	P	Kappa	P	Kappa	NEO-PI-R	Acts
Area of functioning	.82	.76	.97	.88		
Cognitive-self					.41	.02
Cognitive-others					.12	.01
Affective-preferences					.15	.00
Affective-feelings					.18	.13
Behavioral					.16	.85
Trait reference	.93	.74	1.00	1.00		
Yes					.16	.00
No					.84	1.00
Situation reference	.89	.70	.83	.65		
Yes					.25	.39
No					.75	.62
Frequency reference	.94	.86	.99	.85		
Yes					.32	.04
No					.69	.97
Time frame reference	.96	.73	1.00	1.00		
None					.93	.00
Past					.04	1.00
Present					.00	.00
Future/Hypothetical					.03	.00

Note. P = raw proportion agreement between two coders. Kappa is coder reliability corrected for chance agreement. The proportions in the last two columns are the averages of the two coders.

Table 2

Alpha Reliabilities and Mean Inter-act Correlations for Act Composites

Act composite	Number of acts	United States		Philippines	
		α	Mean inter-act correlation	α	Mean inter-act correlation
Dominant	7	.73	.27	.72	.28
Extraverted	11	.67	.16	.78	.25
Supplemental extraverted[a]	6	.55	.17	.44	.12
Submissive	10	.78	.26	.46	.08
Introverted	7	.56	.16	.41	.10
Aloof	5	.63	.26	.65	.27
Agreeable	15	.76	.18	.81	.23
Warm	2	.41	.25	.42	.27
Supplemental agreeable	4	.39	.14	.06	.02
Quarrelsome	7	.73	.27	.75	.30
Aggressive	6	.79	.39	.78	.37
Cold	2	.38	.25	.49	.32
Supplemental disagreeable	6	.76	.34	.60	.19
Conscientious	8	.50	.12	.57	.15
Responsible	7	.45	.11	.63	.19
Planful	4	.32	.08	.43	.16
Supplemental conscientious	8	.45	.12	.66	.21
Unconscientious	3	.50	.26	.55	.29
Irresponsible	6	.70	.29	.63	.22
Carefree/spontaneous	4	.45	.19	.48	.20
Emotionally unstable	9	.75	.27	.72	.23
Insecure	10	.70	.19	.63	.14
Supplemental neuroticism	2	.46	.30	.57	.40
Emotionally stable	6	.51	.15	.62	.21
Secure	4	.46	.19	.49	.20
Intelligent	8	.62	.16	.63	.17
Cultured	5	.72	.34	.58	.22
Supplemental openness	11	.66	.16	.58	.12
Stupid	3	.57	.30	.37	.17
Uncultured	6	.69	.28	.75	.34
Supplemental lack of openness	5	.44	.13	.32	.08
Mean		.58	.22	.57	.21

[a]One act which was apparently misunderstood in the reverse direction was deleted from this composite.

Table 3

Principal Components Matrix for Residualized Act Composites

Act composite	United States					Philippines					Item congruence
	C	A	N	E	O	C	A	N	E	O	
Conscientious	**.61**	.20	−.24	−.11	−.06	**.63**	.31	−.09	−.19	.17	.91
Responsible	**.61**	.10	−.22	.09	.26	**.68**	.25	−.09	.01	.28	.96
Supplemental conscientiousness	**.66**	.23	−.24	−.07	.03	**.67**	.24	−.19	.20	.08	.98
Planful	**.57**	.23	−.10	−.12	−.10	**.61**	.07	.17	−.18	.19	.79
Unconscientious	**−.65**	−.28	.15	.05	.19	**−.62**	−.12	.29	−.15	−.06	.86
Irresponsible	**−.78**	−.09	−.13	−.18	.04	**−.71**	−.05	.13	−.10	−.04	.93
Carefree/spontaneous	**−.59**	−.09	−.31	−.05	.13	**−.60**	.03	−.18	−.01	.17	.97
Stupid[a]	**−.43**	−.08	.13	−.21	.12	**−.51**	.04	.49	−.21	.12	.88
Agreeable	.41	**.63**	−.11	.30	.01	.37	**.66**	−.23	.25	−.09	.98
Warm	.24	**.49**	.04	.29	−.11	.12	**.46**	−.06	.38	.18	.86
Secure[a]	.04	**.68**	−.11	.23	−.15	.15	.46	.03	**.50**	−.20	.86
Quarrelsome	−.22	**−.54**	.28	.19	−.40	−.21	**−.69**	.09	−.08	−.32	.89
Aggressive	−.18	**−.59**	.02	−.14	.08	−.05	**−.76**	.07	−.02	−.18	.88
Cold	−.28	**−.49**	−.37	−.14	−.20	−.18	**−.59**	−.06	−.02	−.13	.85
Supplemental disagreeableness	.22	**−.29**	−.01	−.28	−.18	.22	**−.46**	.38	−.05	−.27	.70
Supplemental lack of openness[a]	−.09	**−.52**	−.17	−.32	.14	−.25	**−.54**	−.10	−.15	.10	.93
Emotionally unstable	−.11	.14	**.67**	.04	−.50	−.27	.03	**.59**	−.18	−.29	.90
Insecure	−.02	.26	**.50**	−.42	−.37	−.10	.18	**.47**	−.46	−.40	.99
Supplemental neuroticism	.18	.01	**.70**	.11	−.21	−.01	.08	**.76**	.02	−.04	.92
Emotionally stable	.15	.39	**−.53**	.22	.01	.30	.26	**−.48**	−.30	.20	.92
Supplemental extraversion[a]	.17	.19	**−.48**	.35	.03	−.05	.23	**−.73**	−.03	−.06	.75
Dominant	.31	−.34	−.19	**.61**	.04	.06	−.14	−.40	**.46**	−.07	.84
Extraverted	.00	.29	−.39	**.57**	−.07	−.19	.36	−.35	**.50**	−.10	.96
Submissive	.02	.40	.36	**−.51**	−.01	−.04	.38	.33	**−.54**	−.13	.98
Introverted	.03	−.16	.24	**−.60**	.03	−.11	−.09	.01	**−.67**	−.07	.90
Aloof	.05	**−.37**	.16	−.26	−.15	.06	−.35	.02	**−.60**	−.18	.88
Intelligent	.08	.09	−.19	.22	**.75**	.47	.21	−.17	.18	**.54**	.83
Cultured	.11	.17	.11	.15	**.73**	.19	.16	−.07	−.01	**.69**	.94
Supplemental openness	.10	.45	.04	.25	**.48**	−.06	.32	.11	.45	**.53**	.92
Uncultured	−.35	−.34	.22	.11	**−.42**	**−.51**	−.44	−.29	−.04	−.19	.91
Factor congruence[b]	.93	.95	.85	.85	.86						

Note. The first unrotated principal component was regressed onto each of the 30 composites. The residuals were then analyzed using principal components analysis followed by varimax rotation. The United States varimax solution was then Procrustes-rotated using the Philippine varimax solution as the target matrix. Within each culture, the highest factor loading for each composite is shown in boldface. The Extraversion component was reflected (i.e., the sign of the loadings reversed) so that high scores indicate extraversion rather than introversion.

C = Conscientiousness, A = Agreeableness, N = Neuroticism, E = Extraversion, O = Openness to Experience.

[a]These act composites were grouped where they loaded best rather than with the originally intended Big Five component.

[b]Factor congruence coefficients computed between the United States and Philippine components after the United States components were Procrustes-rotated to the Philippine varimax-rotated component matrix.

Table 4

Correlations between Act Composite Component Scores and NEO-PI-R Big Five Domain Scores

NEO-PI-R Domain scores	Act composite component scores				
	N	E	O	A	C
			United States sample		
N	**.74****	-.41**	**-.48****	-.06	-.16**
E	-.43**	**.64****	.17*	.46**	.39**
O	-.21**	.49**	**.48****	.44**	.23**
A	.00	.12	.22**	**.55****	.33**
C	-.32**	.48**	.14	.26**	**.57****
			Philippines sample		
N	**.57****	-.21**	-.28**	-.15*	-.09
E	-.31**	**.49****	-.01	-.24**	-.04
O	.01	.25**	.22**	.28**	.14
A	.04	-.08	.02	**.49****	.16*
C	-.21**	.12	.25**	.04	**.62****

Note. In each culture, the highest correlation for each act component is shown in boldface, except for Openness to Experience in the Philippine sample, for which no correlations were greater than .30. N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness, C = Conscientiousness.

** $p < .01$.

* $p < .05$.

Table 5

Big Five Prediction of Act Composites

Act composite	United States			Philippines		
	Highest Big Five correlate		R	Highest Big Five correlate		R
Dominant	E	.30	.48	E	.49	.57
Extraverted	E	.51	.57	E	.73	.75
Supplemental extraverted	E	.44	.53	E	.42	.46
Submissive	N	.43	.51	N	.26	.41
Introverted	N	.38	.44	N	.25	.35
Aloof	N	.35	.46	A	-.33	.42
Agreeable	E	.38	.48	E	.47	.58
Warm	E	.37	.50	E	.56	.61
Quarrelsome	A	-.50	.62	A	-.48	.56
Aggressive	A	-.39	.42	A	-.46	.53
Cold	A	-.32	.44	A	-.38	.45
Supplemental disagreeable	A	-.35	.42	A	-.40	.51
Conscientious	C	.40	.46	C	.49	.52
Responsible	C	.30	.33	C	.57	.59
Planful	C	.27	.38	C	.36	.44
Supplemental conscientious	C	.45	.51	C	.56	.63
Unconscientious	C	-.41	.43	C	-.41	.48
Irresponsible	C	-.40	.44	C	-.39	.47
Carefree/spontaneous	C	-.25	.36	A	-.31	.45
Emotionally unstable	N	.69	.73	N	.57	.61
Insecure	N	.57	.59	N	.45	.50
Supplemental neurotic	N	.58	.62	N	.48	.53
Emotionally stable	E	.29	.32	N	-.43	.58
Secure	E	.32	.43	E	.50	.55
Intelligent	O	.38	.46	C	.48	.57
Cultured	O	.50	.54	O	.29	.39
Supplemental openness	O	.41	.45	O	.56	.64
Stupid	C	-.31	.36	C	-.40	.43
Uncultured	A	-.38	.44	A	-.41	.48
Supplemental lack of openness	A	-.36	.37	A	-.44	.45
Mean absolute value		.40	.47		.46	.52

Note. All Pearson and multiple correlations were statistically significant at $p < .01$.

R = multiple correlation when act composite was regressed onto the NEO-PI-R Big Five domain scores simultaneously. E = Extraversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness to Experience.

Table 6
Culture-Equivalent Acts for each Big Five Domain

Big Five domain	Act statements
Extraversion	Talked a lot; Chatted with strangers; Made others laugh; Mixed well with strangers at a social function.
Agreeableness	Made a decision without consulting the others involved; Talked frankly with someone even if I know I might hurt his or her feelings; Got into an argument; Criticized someone; Argued with someone whose lifestyle I don't approve of.
Conscientiousness	Checked out every detail on a task I completed; Put my clothes neatly away; Did not put away my things when I finished a project or an activity; Did my very best in all my activities.
Neuroticism	Experienced a lot of stress; Let a person intimidate me; Put myself down; Broke down when a problem arose; Felt slighted when my contribution was not sufficiently acknowledged.
Openness to experience	Listened with interest to a news story about another country; Listened with interest to someone whose values or beliefs differed from mine.

Table 7
Cultural Differences in Act Prevalence

Act statement	Regression intercepts		Modification indices	
	U.S.	Philippines	U.S.	Philippines
		Extraversion		
Initiated a conversation with a shy person.	3.03	3.76	20.62	16.71
Went out to socialize.	3.86	3.09	14.29	12.97
Smiled at a stranger.	3.80	3.24	8.80	10.43
Introduced myself to someone new.	3.22	3.67	8.08	6.47
Felt cheerful and happy.	4.15	4.51	6.34	5.75
Smiled and laughed with others.	3.98	4.10	4.83	9.76
		Agreeableness		
Did something risky for fun.	2.85	1.73	33.78	29.78
Swore	3.26	2.28	19.88	16.06
Said/did something to hurt someone's feelings.	2.13	1.63	11.19	10.72
Encountered a situation that confirmed to me that I am better than others.	2.41	2.87	8.87	6.56
Persuaded someone to do something he or she didn't want to do.	2.40	2.05	4.03	4.72
		Conscientiousness		
Got a good grade on an assignment or exam.	4.08	3.41	43.99	22.10
Finished a task on time.	4.55	3.61	41.61	68.36
Did an important task well.	3.99	3.57	17.80	15.83
Had a plan for what I wanted to accomplish each day.	3.73	3.40	5.41	5.67
		Neuroticism		
Felt anxious about work that needed to be done.	3.74	3.22	16.85	14.06
Took a setback well and didn't let it upset me.	2.90	3.40	13.74	14.76
Complained about a problem I was having.	3.31	2.98	4.76	6.91
Acted moody.	2.82	2.48	4.36	5.81
		Openness to experience		
Enjoyed some art.	2.88	3.45	17.17	12.51
Discussed politics.	2.58	2.89	4.55	-

Table 8
Cultural Differences in Act Relevance

	Regression slopes		Modification indices	
Act statement	**U.S.**	**Philippines**	**U.S.**	**Philippines**
Extraversion				
Talked very little in a group of people.	-.36	.35	18.46	7.87
Asked for approval and acceptance from my friends.	.03	.45	6.55	-
Gave in to what someone else wanted.	-.04	.34	5.45	-
Told lots of jokes.	.02	.41	4.9	-
Conscientiousness				
Let others make plans or decisions that affected me.	-.03	-.43	6.40	-
Used my free time to explore new ideas.	.01	.38	5.60	4.28
Got up early to do my schoolwork.	-.01	.33	4.18	-
Neuroticism				
Apologized for a minor mistake.	.37	-.02	7.52	4.50
Felt guilty about something.	.58	.17	7.37	7.12
Worried about something that was beyond my control.	.55	.30	5.39	-
Could not concentrate on my reading because my mind was wandering.	.48	.11	5.33	4.93

Note. No acts in the Agreeableness or Openness to Experience domains met our criteria for differential relevance across the two cultures.