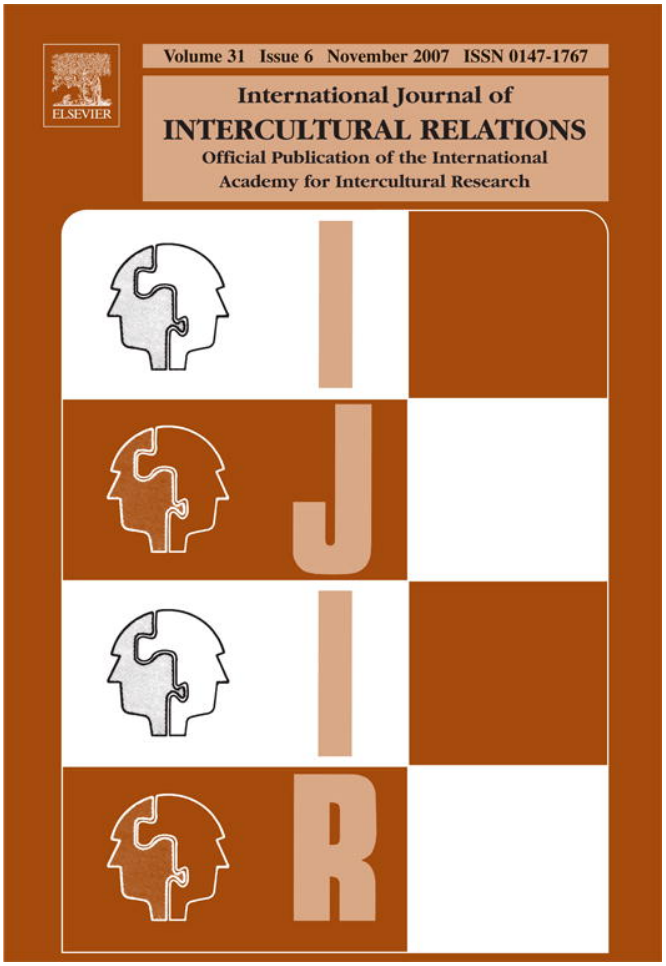
Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.




This article was published in an Elsevier journal. The attached copy is furnished to the author for non-commercial research and education use, including for instruction at the author's institution, sharing with colleagues and providing to institution administration.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

http://www.elsevier.com/copyright

Author's personal copy

ELSEVIER

International Journal of Intercultural Relations
31 (2007) 747–759

International Journal of
INTERCULTURAL
RELATIONS

www.elsevier.com/locate/ijintrel

# The Intercultural Adjustment Potential Scale (ICAPS) predicts adjustment above and beyond personality and general intelligence

David Matsumoto[a,*], Jeffery A. LeRoux[b], Yvette Robles[a], Guillermo Campos[a]

[a]*Department of Psychology, San Francisco State University, 1600 Holloway Avenue, San Francisco, CA 94132, USA*
[b]*Center for Psychological Studies, 2288 Fulton Street, Berkeley, CA 94704*

Accepted 28 August 2007

**Abstract**

Recent research has shown that the psychological skills assessed by the Intercultural Adjustment Potential Scale (ICAPS) can predict adjustment, above and beyond what is already accounted for by personality. The purpose of this study was to examine if the skills tapped by the ICAPS can predict adjustment above and beyond that accounted for by both personality and general intelligence, and whether intelligence can predict adjustment above and beyond skills and personality. International students completed a battery of instruments including the ICAPS, a personality measure, and several adjustment indices. In a separate session they also completed a measure of general intelligence. The results indicated that the ICAPS did predict adjustment independently of both personality and intelligence, but that intelligence did not.
© 2007 Elsevier Ltd. All rights reserved.

*Keywords:* Intelligence; ICAPS; Adjustment; Personality; Emotion regulation

*Corresponding author. Tel.: +1 510 236 9171; fax: +1 510 217 9608.
*E-mail address:* dm@sfsu.edu (D. Matsumoto).

0147-1767/$ - see front matter © 2007 Elsevier Ltd. All rights reserved.
doi:10.1016/j.ijintrel.2007.08.002

Author's personal copy



## 1. Introduction

Intercultural adjustment and adaptation are more important today than ever before. Although the difference between them is often blurred, it is important to distinguish between them. On one hand adaptation is based in the sociocultural domain (Ward, 2001); i.e., it refers to the process of altering one's behavior to fit in with a changed environment or circumstances, or as a response to social pressure. On the other hand, adjustment refers to the subjective experiences that are associated with and result from attempts at adaptation, and that motivate further adaptation. Adjustment involves a wide range of experiences, including self-awareness and self-esteem (Kamal & Maruyama, 1990), mood states (Stone Feinstein & Ward, 1990), and health status (Babiker et al., 1980; all cited in Ward, 2001). Brislin (1993) identified three factors of adjustment, including (1) having successful relationships with people from other cultures; (2) feeling that interactions are warm, cordial, respectful, and cooperative; and (3) accomplishing tasks in an effective and efficient manner. Gudykunst, Hammer, and Wiseman (1977) included the ability to manage psychological stress effectively. Black and Stephens (1989) identified adjustment involving daily activities, interpersonal relations, and work.

In this paper, we examine the psychological factors that contribute to intercultural adjustment. Previous research has identified a host of such factors (Bhawuk & Brislin, 1992; Hammer, Bennett, & Wiseman, 2003; Van der Zee & Van Oudenhoven, 2000). Within this genre, our work has used the Intercultural Adjustment Potential Scale (ICAPS), which can predict intercultural adjustment measured in a variety of ways, including self-, peer, and observer reports, and behavioral tasks (Matsumoto, LeRoux, Bernhard, & Gray, 2004; Matsumoto et al., 2001). The ICAPS was based on the assumption that intercultural conflict is inevitable, and that one of the keys for adjustment is the ability to manage conflict well. Four constructs are measured by the ICAPS: emotion regulation, openness, flexibility, and critical thinking (Matsumoto et al., 2003). Of these, emotion regulation appears to be especially important; it allows individuals engaged in conflict to manage their emotional reactions, affording them to seek and internalize new cognitive structures that reduce conflict and build interpersonal and intercultural relations. We view these constructs as psychological skills because they can be trained and change over time (McKenzie, Matheson, McKaskie, Hamilton, & Murray, 2000; Russell, Chu, & Phillips, 2006).

Personality also contributes to adjustment (Gough, 1986; Lazarus, 1963), and recent studies involving the Big Five personality traits (Extraversion, Neuroticism, Openness, Conscientiousness, and Agreeableness) have continued to provide support for these relationships (Costa & McCrae, 1980; DeNeve & Cooper, 1998; Heady & Wearing, 1989; Lucas & Fujita, 2000; Watson & Clark, 1992) For example, Robins, Tracy, Trzesniewski, Potter, and Gosling (2001) examined the relationship between traits and self-esteem on a sample of 326,641 individuals who participated in an online study. The five dimensions cumulatively accounted for about 34% of the variance of self-esteem, and this finding was robust across different age groups, gender, social class, ethnicity, and nationality. Personality traits predict intercultural adjustment as well (Matsumoto et al., 2004, 2001).

Another individual-level variable that may be related to adjustment is general intelligence. Although several definitions of intelligence exist (Gardner, 1993; Sternberg, 1985), it generally refers to a host of mental abilities, such as problem solving, reactivity, spatial perception, mental flexibility, verbal knowledge, and abstract reasoning. Sternberg (2004), in fact, defines intelligence as the mental abilities necessary for adaptation, and if

Author's personal copy



individuals can adapt better, they may be better adjusted as well. Successful intercultural adjustment, like adaptation, requires that one detects differences, solve problems, access knowledge bases, and think out-of-the-box. Spatial perception and the speed of mental processing are clearly helpful in analyzing problems quickly, while analytic and abstract reasoning can aid in the search for solutions to those problems, all of which are fundamental features of adaptation. In short, individuals who think on their feet faster may adapt more effectively and adjust well. These relationships have received some modest support (Austin et al., 2002) (although a number of studies have also reported little or no relationship between intelligence and adjustment see Canivez, Neitzel, & Martin, 2005; Chan, 2003; Lipsitz, Dworkin, & Erlenmeyer-Kimling, 1993).

Thus, specific skills, personality factors, and general intelligence may all contribute to intercultural adjustment. And, their contributions to the prediction of adjustment may be independent of each other. For example, the skills tapped by the ICAPS are independent of personality traits in their prediction of intercultural adjustment (Matsumoto et al., 2004, 2001), suggesting that personality traits provide individuals with the dispositions needed to develop skills such as emotion regulation, openness, flexibility, and critical thinking that are directly related to adjustment. Thus, traits such as Neuroticism are related to skills like emotion regulation; they both predict intercultural adjustment; but emotion regulation goes beyond Neuroticism in predicting it.

Likewise, general intelligence may also predict adjustment independently of personality and specific skills, for several reasons. Intelligence refers to a host of cognitive skills that is conceptually independent of personality traits, and studies examining the relationship between intelligence and personality have reported mixed results. Some studies report modest relationships between them (Chamorro-Premuzic, Furnham, & Petrides, 2006; Furnham & Chamorro-Premuzic, 2006; Moutafi, Furnham, & Paltiel, 2005). Among young adults, for instance, Extraversion and Openness are positively related to intelligence (Baker & Bichsel, 2006). But, some studies report no relationship (Escorial, Garcia, Cuevas, & Juan-Espinosa, 2006).

To our knowledge, no study to date has examined whether general intelligence can predict intercultural adjustment, either solely or above and beyond that already predicted by personality and specific psychological skills. The purpose of this study was to do so. In this study, international students completed a battery of tests that included a standard intelligence test, the ICAPS, a measure of personality, and various measures of adjustment. We hypothesized that (1) the ICAPS will predict intercultural adjustment, replicating previous findings. We further hypothesized that (2) general intelligence will predict intercultural adjustment, and (3) will be associated with ICAPS scores. Finally, commensurate with the theoretical rationale developed above, we hypothesized that (4) the skills measured by the ICAPS will predict adjustment above and beyond that already predicted by general intelligence and personality, and that (5) general intelligence will predict intercultural adjustment above and beyond that already predicted by personality and skills.

## 2. Method

### 2.1. Participants

Participants were 35 international undergraduate students at San Francisco State University (SFSU) (25 females, 10 males, mean age 24). Their mean length of time in the

Author's personal copy



US was 6 years (many students come to the San Francisco bay area as either high schoolers, or attend junior college part time before entering 4-year universities). Participants were recruited from classes in psychology, human sexuality, and speech and communication.

### 2.2. Instruments

#### 2.2.1. Adjustment variables

We selected a host of adjustment variables to use in this study, for several reasons. Each of the variables has a long history of use in the intra- and intercultural adjustment literature (reviewed above), including our studies involving the ICAPS and personality (reviewed above), thus assuring comparability in the findings. Also, because adjustment involves a constellation of subjective experiences, we wanted to ensure an assessment of a variety of adjustment variables, not limited to one or two.

*2.2.1.1. Beck Depression Inventory II (Beck, Steer, & Brown, 1996).* Participants rated 21 items on a scale ranging from 0 to 3 that best described how they felt. The total score was computed by summing all items ($\alpha = .88$).

*2.2.1.2. Beck Anxiety Inventory (Beck & Steer, 1993).* This 21-item measure assessed the severity of self-reported anxiety. Participants rated how they felt using a 4-point scale ranging from *not at all* (0 points) to *severely* (3 points). The total score was computed by summing all items ($\alpha = .92$).

*2.2.1.3. Beck Hopelessness Scale (Beck & Steer, 1988).* This 20-item, *true* or *false* scale measured the extent of pessimism or negative expectancy about the intermediate or long-range future. The total score was calculated by summing all the items ($\alpha = .84$).

*2.2.1.4. Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).* Participants rated this 5-item scale, which measured subjective well-being, using a 7-point rating scale. Summing the five items yielded the total score ($\alpha = .83$).

*2.2.1.5. Measurement of Culture Shock (Mumford, 1998).* This measure consists of 12 items that estimated the degree of six aspects of culture shock. There are two subscales: seven core culture shock items and five interpersonal stress items. Participants ranked in order from 2 to 0 their adjustment difficulty. The sum of the two subscales provided a total score (range 0–24). For the purpose of this study, only the total score was used ($\alpha = .73$).

*2.2.1.6. Homesickness/Contentment Scale (Shin & Abell, 1999).* The 20-item measure assessed psychological adjustment to a new culture, specifically, homesickness, loneliness, and depression. There are two subscales: homesickness and contentment. Participants used a 5-point rating scale ranging from 1 (*very often*) to 5 (*never*). The two subscale scores were computed by summing the items loading on each scale ($\alpha = .88$ and .95 for Homesickness and Contentment, respectively).

Author's personal copy



*2.2.2. Predictors*

*2.2.2.1. ICAPS.* This 55-item scale assessed intercultural adjustment potential. There are four subscales: Emotion Regulation (ER), Openness (OP), Flexibility (FL), and Critical Thinking (CT). Using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) participants rated the degree each item described them accurately. Five scores are computed: Total, ER, OP, FL, and CT. For a copy of the ICAPS, please contact the first author at dm@sfsu.edu.

*2.2.2.2. NEO-Five Factor Inventory (Costa & McCrae, 1992).* This 60-item questionnaire measures the five personality domains that represent the universal five factor model of personality: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Respondents used a 5-point scale ranging from 1, Disagree Strongly to 5, Agree Strongly in response to each item. Alphas were acceptable for all scales (.83, .77, .78, .74, and .79, respectively).

*2.2.3. Demographic information*

Participants also completed an one page confidential personal information form that included questions about gender, age, race/ethnicity, religious or spiritual background, household dynamics, relationship status, place of birth, primary place of upbringing, native language, SES, occupation, student status, educational level, Test of English as a Foreign Language (TOEFL) scores, and degrees attained.

*2.2.4. Intelligence: The Wechsler Adult Intelligence Scale-Third Edition (Wechsler, 2001)*

This scale is a multi-section measure of general intelligence. There are two subscales, verbal IQ (VIQ) and performance IQ (PIQ), comprised of 14 subtests, 13 of which were used in this study. Total IQ is an aggregate of the VIQ and PIQ.

*2.2.4.1. Performance IQ subtests.* The seven PIQ sub-tests include: picture completion, digit symbol-coding, block design, matrix reasoning, picture arrangement, symbol search, and object assembly. Picture completion assesses attention to details, the ability to discriminate what is important and screen out what is not important, as well as visual scanning, perception, acuity and alertness. Digit symbol-coding measures visual scanning, motor dexterity, memory, and speed of processing as well as persistence in completing an unattractive task. Block design assesses visual analysis, motor speed and coordination, construction abilities, flexible problem solving, and spatial reasoning. Part–whole thinking and nonverbal reasoning are also determined. Matrix reasoning measures visual organization, alertness to detail, and manipulation of objects. Logical analysis and nonverbal reasoning are also assessed. Picture arrangement determines the degree of the following skills employed: Visual sequencing and perception, sequential logic and planning, cognitive flexibility, social awareness and sensitivity skills. Symbol search assesses the ability to work under pressure, discriminate spatial features, speed and accuracy of visual information processing, scanning, and sustained attention to the task. Object assembly measures visual organization, coordination, and analysis. It also assesses the ability to deal with part-whole relationships and to work without a model.

*2.2.4.2. Verbal IQ subtests.* The seven VIQ subtests include: vocabulary, similarities, arithmetic, digit span, information, comprehension, and letter-number sequencing.

Author's personal copy



To establish conceptual equivalence for an international sample the vocabulary subtest was not administered. Similarities measures comprehension, mental flexibility, categorical thinking and verbal abstract reasoning. Arithmetic assesses basic mathematical skills that do not extend past the 7th grade level, attention span, immediate recall, and the ability to withstand distraction. Digit span measures auditory attention span, immediate recall, alertness, as well as the abilities to retain sequenced information, withstand distraction, and hold and manipulate information mentally. Information measures general information regarding historical facts, geography, and scientific trivia learned through schooling and life experience. Comprehension determines the degree an individual employs common sense judgment, mental flexibility, and abstract thinking. It also assesses verbal facility and ability to communicate as well as an understanding of familiar social practices and institutions. Letter-number sequencing measures auditory attention span and sequence memory, working memory, and the ability to resist distractions.

*2.2.4.3. Scoring, validity, and alphas.* The scale was individually administered to participants by one of two trained administrators. A full-scale IQ score was computed by averaging all subscale scores. All scores were age adjusted ($\alpha$ for the full-scale IQ was .69).

### *2.3. Procedures*

The participants completed the questionnaires at home at their leisure and came to the laboratory to participate in the WAIS administration. This order was counterbalanced across participants. The questionnaire packets contained a consent form, the demographics form, the adjustment and predictor questionnaires described above, and an instruction sheet; the order of the questionnaires within packets was random. Participants were given the option of English, Spanish, or Japanese language ICAPS questionnaires; all other instruments were administered in English. The time commitment per participant to complete the questionnaire packets was approximately 90 min. The WAIS was administered in English, and took an average of 2.5 h to complete per participant.

### *2.4. Data analysis*

Hypotheses 1–3 proposed bivariate relationships between ICAPS scores, WAIS scores, and adjustment; thus these were tested using Pearson correlations. Hypotheses 4 and 5 proposed that ICAPS scores (Hypothesis 4) or WAIS scores (Hypothesis 5) predicted unique variance in adjustment above and beyond the other predictor variables; thus these were tested using hierarchical regressions involving the inclusion of the control variables in the first steps, and the target predictor variable on the last. Because the ratio of the number of independent variables to cases was large, we opted for stepwise inclusion criteria at each step.

## 3. Results

### *3.1. Hypothesis 1: Does ICAPS predict adjustment?*

Product–moment correlations were computed between the five ICAPS scores and all adjustment variables (Table 1). At least one of the ICAPS scales was correlated with five of

Author's personal copy



the seven adjustment variables, indicating that the psychological constructs tapped by the ICAPS did predict adjustment, replicating previous results and supporting Hypothesis 1 (Matsumoto et al., 2004, 2003, 2001). In particular, individuals with higher levels of emotion regulation and flexibility were better adjusted, having lower scores on depression, anxiety, hopelessness, and higher scores on contentment.

### 3.2. Hypothesis 2: Is general intelligence associated with adjustment?

We computed correlations between the WAIS subscales and total score and the adjustment variables. Surprisingly, none of the adjustment variables was correlated with the WAIS total score. There were, however, some correlations with the specific WAIS subscales (Table 2), providing modest support for Hypothesis 2. Of these, it is interesting that five of the seven WAIS subtests that predicted adjustment came from the Performance section of the WAIS. These subtests assess accuracy and speed of visual perception and information processing, cognitive flexibility, sustained attention, sequential logic, discrimination, and flexible problem solving, all of which are theoretically related to intercultural adaptation and adjustment. Interestingly, none of these subtests was correlated with self-reported TOEFL scores, which suggests that the correlations with adjustment were not confounded with language proficiency. Of course, zero-order correlations cannot be used to infer causation; thus it is not clear whether poorer WAIS Performance scores lead to lower adjustment, or whether lower adjustment leads to poorer WAIS performance.

### 3.3. Hypothesis 3: Is the WAIS correlated with ICAPS?

We correlated the five ICAPS scores with all 13 WAIS subscales and the WAIS Total. Verbal—similarities was significantly positively correlated with ICAPS Total, $r(35) = .50$, $p < .05$; ICAPS flexibility, $r(35) = .48$, $p < .05$; and negatively with critical thinking, $r(35) = -.47$, $p < .05$. These relationships made sense, as Similarities measures comprehension,

Table 1
Zero-order correlations between the ICAPS scores and the adjustment indices

| Adjustment variables | ICAPS scales | | | | |
|---|---|---|---|---|---|
| | Total | Emotion Regulation | Openness | Flexibility | Critical Thinking |
| Beck Depression Inventory | −.45** | −.55** | .00 | −.38* | .40* |
| Beck Anxiety Inventory | −.46** | −.43* | −.14 | −.43* | .20 |
| Beck Hopelessness Scale | −.50** | −.46** | −.27 | −.61** | .32 |
| Satisfaction with Life Scale | .17 | .10 | −.03 | .42* | −.16 |
| Culture shock | −.01 | −.01 | .04 | .08 | −.06 |
| Homesickness total | .11 | .19 | −.10 | .05 | −.15 |
| Contentment total | .50** | .61** | .06 | .53** | −.40* |

*$p < .05$; **$p < .01$.
$N = 35$.

Author's personal copy



Table 2
Summary of significant correlations between the WAIS and adjustment

| WAIS domain | Subtest | Adjustment variable | $r(35) =$ |
|---|---|---|---|
| *Verbal* | Similarities | Beck Anxiety Inventory | −.46* |
| | | Beck Hopelessness Scale | −.38$^{+}$ |
| | Letter-number sequencing | Culture shock | −.37$^{+}$ |
| *Performance* | Block design | Beck Anxiety Inventory | −.51* |
| | Picture arrangement | Beck Anxiety Inventory | −.42* |
| | Symbol search | Homesickness | −.46* |
| | Picture completion | Homesickness | −.48* |
| | Digit symbol | Satisfaction with Life Scale | .45* |

*$p < .05$; $^{+}p < .10$.

mental flexibility, and verbal abstract reasoning, all of which are important to adjustment potential. Only two of the remaining 65 correlations were significant, indicating that the ICAPS scores were largely independent of the other constructs assessed by the WAIS. Thus, Hypothesis 3 received only very modest support.

### 3.4. Hypothesis 4: Does the ICAPS predict adjustment above and beyond both personality and intelligence?

We computed hierarchical multiple regressions on the seven adjustment variables, in which we entered all 13 WAIS subscales on the first step, all 5 personality scales on the second, and all five ICAPS scores on the third. (The ICAPS total scores were included with the scale scores because they were not mathematically related to each other.) Stepwise inclusion criteria were used on each step. ICAPS scores significantly predicted five of the seven adjustment variables above and beyond what was already accounted for by personality and general intelligence (Table 3). Moreover, because the ICAPS scores for these variables were somewhat independent of general intelligence and personality, the final *R*s were considerably high (.55–.80), indicating that a substantial portion of the variance in adjustment was accounted for by WAIS, personality, and ICAPS scores.

We also retested this hypothesis using the WAIS total score instead of the 13 subscale scores, in the same type of hierarchical regression. ICAPS scales predicted three adjustment variables above and beyond that already accounted for by personality and general intelligence (Table 4). Once again, the final *R*s were considerably high (.75–.80).

### 3.5. Hypothesis 5: Does intelligence predict adjustment above and beyond personality and ICAPS?

We then computed hierarchical regressions on the adjustment variables in which the ICAPS scores were entered first, traits second, and the WAIS subscales third, using stepwise inclusion criteria on each step. In no analysis did the WAIS subscales predict variance in the adjustment variables that was not already accounted for by ICAPS scores or personality. Recomputation of these analyses using the WAIS total score produced the same results. These findings provided no support for Hypothesis 5; general intelligence did

Author's personal copy



Table 3
Summary of results of hierarchical regressions testing the ability of ICAPS scores to predict adjustment above and beyond personality and general intelligence, using WAIS subscales

| Adjustment variables | Final $R$ | $\Delta R^2$ | Significant ICAPS scales entered | Beta |
|---|---|---|---|---|
| Beck Anxiety Inventory | .75** | .12* | Total | −.42* |
| | | | Openness | −.33* |
| Beck Hopelessness Scale | .77** | .07* | Critical thinking | −.40* |
| Satisfaction with Life Scale | .51* | .09* | Critical thinking | .30* |
| Culture shock | .55* | .14* | Critical thinking | −.37* |
| Contentment | .80** | .03* | Flexibility | .23* |

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

Table 4
Summary of results of hierarchical regressions testing the ability of ICAPS scores to predict adjustment above and beyond personality and general intelligence, using WAIS total score

| Adjustment variables | Final $R$ | $\Delta R^2$ | Significant ICAPS Scales entered | Beta |
|---|---|---|---|---|
| Beck Anxiety Inventory | .75** | .23* | Total | −.48* |
| Beck Hopelessness Scale | .77** | .11* | Total | −.36* |
| Contentment | .80** | .11* | Flexibility | .34* |

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

*not* predict adjustment above and beyond that already accounted for by personality traits and ICAPS scores.

## 4. Discussion

General intelligence was modestly correlated with intercultural adjustment and the ICAPS scores. The ICAPS scores predicted adjustment above and beyond what was already accounted for by personality and intelligence, but intelligence did *not* predict adjustment above and beyond that already accounted for by personality and ICAPS. These findings demonstrate that the psychological constructs associated with intercultural adjustment are somewhat independent of general intelligence and basic personality dispositions.

That the ICAPS was reliably associated with various adjustment outcomes replicates many studies that have demonstrated the same (Matsumoto et al., 2004, 2003, 2001). That general intelligence was also associated with various adjustment variables is a new finding, and to our knowledge the first with international students. Because the data collection for the adjustment variables and intelligence was separated in time, the correlations do not reflect test anxiety. As described above, it may not be surprising that intelligence is associated with intercultural adjustment. Many of the skills and abilities measured by the WAIS are necessary for negotiating daily intercultural life, and for resolving inevitable conflicts. Moreover, general intelligence is associated with intracultural adjustment in

Author's personal copy



a wide range of individuals, across the age range, and from many different ethnic backgrounds (Oliver & Engle, 2005).

The regression results, however, suggested a more nuanced way in which intelligence, personality, and psychological skills combine to predict adjustment, as the skills assessed by the ICAPS predicted adjustment above and beyond the contributions of personality and intelligence, but intelligence did not account for variance in adjustment above and beyond that already predicted by personality and skills. Previous studies have already demonstrated that personality does not predict adjustment above and beyond that already predicted by skills (Matsumoto et al., 2004, 2003, 2001). This pattern of findings leads us to speculate that general intelligence and personality traits are parts of basic human nature that individuals come into the world with, and comprise the fundamental building blocks that individuals use to deal with problems of adaptation to their environmental demands. We speculate that those demands either facilitate or hinder the development of specific psychological skills such as emotion regulation or critical thinking, which, in turn, have direct relationships with adjustment. Thus, specific psychological skills such as emotion regulation, openness, flexibility, and critical thinking become the primary predictors of adjustment, while the influence of personality traits and intelligence is more indirect.

As mentioned above, previous research has identified a host of psychological factors that contribute to intercultural adjustment (Bhawuk & Brislin, 1992; Hammer et al., 2003; Van der Zee & Van Oudenhoven, 2000), and some of the identified constructs overlap. For example, the constructs underlying the Van der Zee and Van Oudenhoven's (2001) Multicultural Personality Questionnaire include Cultural Empathy, Openmindedness, Emotional Stability, Social Initiative, and Flexibility, some of which clearly overlap with the constructs tapped by the ICAPS. These constructs also overlap to some degree with those assessed by Ang's measure of cultural intelligence (Ang, Van Dyne, & Koh, 2006). Future studies will need to compare these various measures in order to identify what the active psychological skills are in predicting adjustment and adaptation.

In addition to the internal, psychological factors that influence adjustment, future, comprehensive theories of adjustment will need to incorporate the influence of factors external to individuals as well. Theoretically, many such potentially contributory factors exist. For instance, research on the cultural level has shown external, environmental factors such as harsher climates lead to behavioral responses that are different than milder climates (Van de Vliert, 2006; Van de Vliert, Huang, & Parker, 2004). The amount of resources, and the ability to obtain them if scarce through affluence, also affects adaptation and adjustment (Diener & Oishi, 2000; Van de Vliert, Huang, & Levine, 2004). Future studies, therefore, will need to incorporate these ecological variables, in conjunction with psychological variables measured on the individual level, to assess their contributions to both intercultural adaptation and adjustment.

These findings were not generated without limitation, including the fact that the adjustment variables were comprised entirely of paper-and-pencil measures. Future studies will need to incorporate behavioral data involving actual interactions in examining the contribution of psychological skills, personality, and intelligence on adjustment. Also, the labor intensive nature of the WAIS administration precluded us from obtaining a large sample; future studies should replicate these findings with larger, and more diverse samples.

Regardless, the findings reported here piece together for both researchers and trainers the various knowledge, skills, and abilities necessary for successful intercultural adaptation

Author's personal copy



and adjustment. There is little question that the psychological skills tapped by the ICAPS can be trained (McKenzie et al., 2000; Russell et al., 2006). That they contribute to adjustment independently from intelligence and personality is good news for all in the intercultural training field. Coupled with knowledge about culture, ethnocentrism, and language, training packages that incorporate improvements in emotion regulation, openness, flexibility, and critical thinking can be a formidable tool in improving intercultural relations in the future.

## Acknowledgements

We thank Ji Kim, Amanda Klobas and Marija Drezgic for their aid in data collection; and Kemberlee Bonnet, Joanne Chung, Jung Yun Jang, Hyi Sung Hwang, Jessie Wilson, and Caroline Jones for their assistance in the general laboratory program.

## References

Ang, S., Van Dyne, L., & Koh, C. S. K. (2006). Personality correlates of the four factor model of cultural intelligence. *Group and Organization Management*, *31*, 100–123.

Austin, E. J., Deary, I. J., Whiteman, M. C., Fowkes, F. G. R., Pedersen, N. L., Rabbitt, P., et al. (2002). Relationships between ability and personality: Does intelligence contribute positively to personal and social adjustment? *Personality and Individual Differences*, *32*, 1391–1411.

Baker, T. J., & Bichsel, J. (2006). Personality predictors of intelligence: Differences between young and cognitively healthy older adults. *Personality and Individual Differences*, *41*(5), 861–871.

Beck, A. T., & Steer, R. A. (1988). *Beck Hopelessness Scale*. San Antonio, TX: The Psychological Corporation.

Beck, A. T., & Steer, R. A. (1993). *Beck Anxiety Inventory*. San Antonio, TX: The Psychological Corporation.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II: Beck depression inventory manual* (2nd ed.). San Antonio, TX: The Psychological Corporation.

Bhawuk, D. P. S., & Brislin, R. (1992). The measurement of intercultural sensitivity using the concepts of individualism and collectivism. *International Journal of Intercultural Relations*, *16*(4), 413–436.

Black, J. S., & Stephens, G. K. (1989). The influence of the spouse on American expatriate adjustment and intent to stay in Pacific Rim overseas assignments. *Journal of Management*, *15*(4), 529–544.

Brislin, R. (1993). *Understanding culture's influence on behavior*. Fort Worth, TX: Harcourt Brace Jovanovich.

Canivez, G. L., Neitzel, R., & Martin, B. E. (2005). Construct validity of the Kaufman Brief Intelligence Test, Wechsler Intelligence Scale for Children-Third Edition, and Adjustment Scales for Children and Adolescents. *Journal of Psychoeducational Assessment*, *23*, 15–34.

Chamorro-Premuzic, T., Furnham, A., & Petrides, K. (2006). Personality and intelligence: The relationship of Eysenck's giant three with verbal and numerical ability. *Journal of Individual Differences*, *27*(3), 147–150.

Chan, D. W. (2003). Adjustment problems and multiple intelligences among gifted students in Hong Kong: The development of the revised Student Adjustment Problems Inventory. *High Ability Studies*, *14*(1), 41–54.

Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology*, *38*, 668–678.

Costa, P. T., & McCrae, R. R. (1992). *Revised Neo-Personality Inventory (NEO-PI-R) and Neo Five Factor Inventory (NEO-FFI)*. Odessa, FL: Psychological Assessment Resources.

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, *124*(2), 197–229.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*, 71–75.

Diener, E., & Oishi, S. (2000). Money and happiness: Income and subjective well-being across nations. In E. Diener, & S. Oishi (Eds.), *Culture and subjective well-being* (pp. 185–218). Cambridge, MA: MIT Press.

Escorial, S., Garcia, L. F., Cuevas, L., & Juan-Espinosa, M. (2006). Personality level on the big five and the structure of intelligence. *Personality and Individual Differences*, *40*(5), 909–917.

Furnham, A., & Chamorro-Premuzic, T. (2006). Personality, intelligence, and general knowledge. *Learning and Individual Differences*, *16*(1), 79–90.

Author's personal copy



Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences* (10th anniversary ed.). New York, NY: Basic Books.

Gough, H. G. (1986). *Manual for the California Psychological Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Gudykunst, W. B., Hammer, M. R., & Wiseman, R. (1977). An analysis of an integrated approach to cross-cultural training. *International Journal of Intercultural Relations*, *1*(2), 99–110.

Hammer, M. R., Bennett, M. J., & Wiseman, R. (2003). Measuring intercultural sensitivity: The Intercultural Development Inventory. *International Journal of Intercultural Relations*, *27*(4), 421–443.

Heady, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Journal of Personality and Social Psychology*, *57*(4), 731–739.

Kamal, A. A., & Maruyama, G. (1990). Cross-cultural contact and attitudes of Qatari students in the United States. *International Journal of Intercultural Relations*, *14*, 123–134.

Lazarus, R. S. (1963). *Personality and adjustment*. Englewood Cliffs, NJ: Prentice-Hall.

Lipsitz, J. D., Dworkin, R. H., & Erlenmeyer-Kimling, L. (1993). Wechsler comprehension and picture arrangement subtests and social adjustment. *Psychological Assessment*, *5*(4), 430–437.

Lucas, R. E., & Fujita, F. (2000). Factors influencing the relation between extraversion and pleasant affect. *Journal of Personality and Social Psychology*, *79*, 1039–1056.

Matsumoto, D., LeRoux, J. A., Bernhard, R., & Gray, H. (2004). Personality and behavioral correlates of intercultural adjustment potential. *International Journal of Intercultural Relations*, *28*(3–4), 281–309.

Matsumoto, D., LeRoux, J. A., Iwamoto, M., Choi, J. W., Rogers, D., Tatani, H., et al. (2003). The robustness of the Intercultural Adjustment Potential Scale (ICAPS). *International Journal of Intercultural Relations*, *27*, 543–562.

Matsumoto, D., LeRoux, J. A., Ratzlaff, C., Tatani, H., Uchida, H., Kim, C., et al. (2001). Development and validation of a measure of intercultural adjustment potential in Japanese sojourners: The Intercultural Adjustment Potential Scale (ICAPS). *International Journal of Intercultural Relations*, *25*, 483–510.

McKenzie, K., Matheson, E., McKaskie, K., Hamilton, L., & Murray, G. C. (2000). Impact of group training on emotion recognition in individuals with a learning disability. *British Journal of Learning Disabilities*, *28*(4), 143–147.

Moutafi, J., Furnham, A., & Paltiel, L. (2005). Can personality factors predict intelligence? *Personality and Individual Differences*, *38*(5), 1021–1033.

Mumford, D. B. (1998). The measurement of culture shock. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 149–154.

Oliver, W., & Engle, R. (2005). *Handbook of understanding and measuring intelligence*. Thousand Oaks, CA: Sage.

Robins, R. W., Tracy, J. L., Trzesniewski, K., Potter, J., & Gosling, S. D. (2001). Personality correlates of self-esteem. *Journal of Research in Personality*, *35*, 463–482.

Russell, T. A., Chu, E., & Phillips, M. L. (2006). A pilot study to investigate the effectiveness of emotion recognition mediation in schizophrenia using the Micro-Expression Training Tool. *British Journal of Clinical Psychology*, *45*, 579–583.

Shin, H., & Abell, N. (1999). The homesickness and contentment scale: Developing a culturally sensitive measure of adjustment for Asians. *Research on Social Work Practice*, *9*(1), 45–60.

Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.

Sternberg, R. J. (2004). Culture and intelligence. *American Psychologist*, *59*(5), 325–338.

Stone Feinstein, E., & Ward, C. (1990). Loneliness and psychological adjustment of sojourners: New perspectives on culture shock. In D. Keats, D. Munro, & L. Mann (Eds.), *Heterogeneity in cross-cultural psychology* (pp. 537–547). Lisse, Netherlands: Swets and Zeitlinger.

Van de Vliert, E. (2006). Autocratic leadership around the globe: Do climate and wealth drive leadership culture? *Journal of Cross-Cultural Psychology*, *37*, 42–59.

Van de Vliert, E., Huang, X., & Levine, R. V. (2004). National wealth and thermal climate as predictors of motives for volunteer work. *Journal of Cross-Cultural Psychology*, *35*, 62–73.

Van de Vliert, E., Huang, X., & Parker, P. M. (2004). Do colder and hotter climates make richer societies more but poorer societies less happy and altruistic? *Journal of Environmental Psychology*, *24*, 17–30.

Van der Zee, K. I., & Van Oudenhoven, J. P. (2000). The Multicultural Personality Questionnaire: A multidimensional instrument of multicultural effectiveness. *European Journal of Personality*, *14*, 291–309.

Author's personal copy



Van der Zee, K. I., & Van Oudenhoven, J. P. (2001). The Multicultural Personality Questionnaire: Reliability and validity of self- and other ratings of multicultural effectiveness. *Journal of Research in Personality*, *35*(3), 278–288.

Ward, C. (2001). The A, B, Cs of acculturation. In D. Matsumoto (Ed.), *Handbook of culture and psychology* (pp. 411–446). New York: Oxford University Press.

Watson, D., & Clark, L. A. (1992). On traits and temperament: General and specific factors of emotional experience and their relation to the five factor model. *Journal of Personality*, *60*, 441–476.

Wechsler, D. (2001). *Manual for the Wechsler Adult Intelligence Scale, III*. New York: Psychological Corporation.