Abstract

Previous research shows that European Americans are consistently more independent (or less interdependent) than Japanese when implicit indices are used to assess independence (vs. interdependence). The present work extended this evidence by including a novel implicit association test (IAT), as an index of implicit attitude toward independence and interdependence. Consistent with the previous findings, as compared to Japanese, Americans were significantly higher in multiple indices of implicit independence (vs. interdependence) including personal (vs. social) self-definition, experience of disengaging (vs. engaging) emotions, and personal (vs. social) form of happiness. Furthermore, as compared to Japanese, Americans had a significantly more positive implicit attitude toward independence assessed with the IAT. As also observed in the previous research, explicit measures showed inconsistent cross-cultural patterns. Lastly, we observed little statistical within-culture coherence among the implicit measures of independence (vs. interdependence), consistent with a view that the implicit indices capture alternative ways for individuals to achieve the cultural mandate of independence or interdependence. (157 words)

Key words: implicit independence, implicit association test, cultural task analysis

Cultural Variation in Implicit Independence:

An Extension of Kitayama et al. (2009)

One central theme in the last two decades of cultural psychological research is that as compared to Asians, European Americans are more independent (or less interdependent) (Kitayama & Uskul, 2011; Markus & Kitayama, 1991). Evidence for this cultural difference is especially strong when implicit psychological tendencies of independence are tested (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). Such implicit tendencies of independence (vs. interdependence) involve dispositional (vs. situational) attribution (Na & Kitayama, 2011), focused (vs. holistic) attention (Masuda & Nisbett, 2001), personal (vs. social) form of happiness (Uchida & Kitayama, 2009), and motivation toward personal (vs. social) goals (Na & Kitayama, 2012). Although much of this cross-cultural evidence is based on behavioral indicators such as judgment, response time, and task performance, an increasing volume of work has documented conceptually equivalent cultural variations with neural indicators (e.g., Kitayama, Park, & Cho, in press; Kitayama & Uskul, 2011). The goal of the current work was to extend this line of work by focusing on three issues.

Implicit Attitudes Toward Independence

One important shortcoming of the above literature of cultural variations in implicit independence is that none of the existing measures assesses *implicit attitudes toward independence (vs. interdependence)*. Implicit attitudes have been investigated extensively over

the last two decades in social psychology (Greenwald & Banaji, 1995). By implicit attitudes, we

mean a set of evaluative associations one has with an attitudinal object or concept at issue.

Thus, one could be said to have positive implicit attitudes toward independence if the person

has more positive (rather than negative) associations with independence. These associations

need not be conscious and, yet, have been shown to influence a variety of social behaviors in

many different domains including racial prejudice (Greenwald, McGhee, & Schwartz, 1998) and

attitudes toward smoking (Andrews, Hampson, Greenwald, Gordon, & Widdop, 2010) or HIV

(Neumann, Hulsenbeck, & Seibt, 2004).

Given the increasing volume of research on implicit attitudes in many domains of

research, we believe that it is a major oversight on the part of cultural psychologists that the

aforementioned cultural difference in independence and interdependence has never been

tested with an implicit attitude measure. The first aim of the current work was to fill this gap of

empirical knowledge by developing an implicit association test (IAT) of implicit attitudes toward

independence vs. interdependence.

Concurrent Assessment of Multiple Indicators of Implicit Independence

Although the hypothesis that Americans are more likely to be independent than Asians

has received support with multiple indicators of implicit independence, most available studies

have tested only one task (e.g., Kitayama et al., 2003; Masuda & Nisbett, 2001). In one

important exception, Kitayama et al. (2009) tested five implicit psychological tendencies of

independence, namely, dispositional bias in causal attribution, focused (vs. holistic) attention,

salience of disengaging (vs. engaging) emotions, form of happiness as personal (vs. social),

and the larger symbolic self. In these implicit measures, European Americans were substantially

more independent than Japanese. Curiously, when these researchers tested correlations

among these five indices of implicit independence, they found no statistical coherence among them. The average correlation was .01 across the cultural groups. The absence of statistical coherence has been found by another recent study by Na and colleagues (2010).

Kitayama et al. (2009) interpreted the absence of statistical coherence in terms of a cultural task analysis. According to this hypothesis, each individual in a given cultural context tries to achieve his or her culture's imperatives such as independence and interdependence differently, depending on their selected set of *cultural tasks*. For example, Tom, an American, may try to be independent by focusing on his personal goals, but another American, Sally, may try to be independent differently, by expressing her uniqueness. Since implicit psychological tendencies are supposedly acquired through active engagement in such selected cultural tasks, depending on which cultural tasks each individual engages in, very different implicit psychological tendencies may be acquired. This consideration would explain why there is no statistical coherence among multiple indicators of implicit independence within each cultural group even though Americans as a whole tend to be higher in independence than Japanese.

However, evidence for the absence of statistical coherence across measures of implicit independence and interdependence is limited. Given the paucity of such evidence, it would seem important to replicate the Kitayama et al. (2009) study and extend it with an additional measure of implicit attitudes toward independence. The second aim of the current study was to address this issue.

Explicit Measures of Independence

Another surprising finding from the Kitayama et al. (2009) study was that when an explicit attitude measure of independence was used, the cultural difference was anomalous. The researchers used the Singelis (1994) scale of independent and interdependent self-

construal. This measure is explicit because it is based on one's conscious evaluation of his or her ideas of being independent and interdependent. The Singelis measure showed that although European Americans were more independent than Japanese, they were also more interdependent than Japanese as well. This anomalous pattern is also consistent with a meta-analysis by Oyserman and colleagues (2002).

This unexpected pattern of cultural difference might result from social desirability that influences explicit measures (e.g., Dunton & Fazio, 1997). Implicit measures are likely to be immune to this artifact. Moreover, Heine and colleagues (2002) argue that when making explicit self-assessment, individuals often compare themselves with others in their *own* group. Thus, Americans may judge their independence or interdependence relative to other Americans, whereas Japanese do so relative to other Japanese. This reference-group bias makes the results of cross-cultural comparisons based on explicit measures suspect. It is important to keep in mind that implicit measures are less likely to be susceptible to this bias.

Present Work

The goal of the present work was three-fold. First, we sought to extend the Kitayama et al. (2009) study by using a newly developed IAT measure of implicit independence. Second, we attempted a replication of the Kitayama et al. (2009) evidence regarding cultural variations in implicit independence as assessed by multiple indicators. We anticipated that Americans would be higher in implicit independence than Japanese across all indicators we used. At the same time, however, we also anticipated that the measures of implicit independence would not show statistical coherence within each cultural group. Third, we tested additional explicit measures of independence and examined whether these measures might fail to show consistent cross-cultural patterns as in the Kitayama et al. (2009) study.

Method

Participants

Fifty-seven European American (41 women; M_{age}= 19.25, SD_{age}= 1.15) and sixty Japanese (25 women; M_{age}= 19.25, SD_{age}= 1.04) college students participated in the study. American participants received $7 and Japanese participants received 700 yen in exchange for their participation. Our preliminary analysis showed no gender effects; gender was therefore dropped in the following analyses.

Materials

We used six tasks to measure independence (vs. interdependence). Four were measures of implicit independence: 1) IAT, 2) Self-description task, 3) Salience of disengaging (vs. engaging) emotions, and 4) Predictors of happiness. The remaining two tasks were measures of explicit beliefs about independence: 5) Self-construal scale and 6) Semantic differential scale. All materials were originally created in English and translated into Japanese by a Japanese and English bilingual. To ensure semantic equivalence, back-translation by another bilingual was used.

Implicit Measures

IAT. We assessed implicit evaluative associations for independence (vs. interdependence) by modifying the standard IAT paradigm (Greenwald et al., 1998). We examined the implicit associative strength between personal and relational verbs and positive and negative adjectives. Stronger associations between personal (vs. relational) verbs and positive (vs. negative) adjectives would indicate more positive implicit attitudes toward independence.

Participants were presented with the stimulus words one at a time on a computer screen and asked to categorize them by pressing one of two response keys as quickly and accurately as possible. We used a standard seven-block procedure (Greenwald et al., 1998). First, participants sorted adjectives by valence. They pressed the left key for positive adjectives (good, beautiful, clean, healthy, wise) and the right key for negative adjectives (bad, ugly, dirty, sick, foolish). Second, they sorted verbs by personal vs. relational type. They pressed the left key for personal verbs (run, read, stand, turn, wear) and the right key for relational verbs (meet, join, ask, visit, help). Third, a practice block was given where the two sorting tasks were combined. The participants were asked to press the left key for both personal verbs and positive adjectives, and the right key for both relational verbs and negative adjectives. Fourth, the same combined block was run again for data collection (the personal + positive combination). Fifth, the participants sorted the verbs again, but with the response keys reversed from the assignments in the second step. Sixth, a practice block was run where the new two sorting tasks were combined (the relational + positive combination). The participants pressed the left key for both the relational verbs and positive adjectives and pressed the right key for the personal verbs and negative adjectives. Seventh, the same combined block was repeated for data collection. The order in which participants performed Steps 3-4 and 6-7 was counterbalanced (see Condition 2, Table 1). Each practice block consisted of 20 trials and each critical block consisted of 40 trials. Implicit attitude was defined as the mean difference in response latency between the two critical combination blocks (i.e., the personal + positive combination, the relational + positive combination).

Following Greenwald, Nosek, & Banaji (2003), we assessed the internal consistency of the IAT score (i.e., latency differences between the two critical combinations) by computing a

split-half reliability index. A correlation was computed between the IAT score derived from the

first half of the trials in each of two critical blocks and the IAT score derived from the second half

of the trials in the same blocks. Both cultural groups showed high levels of reliability [European

Americans: $r(56) = .81$, $p < .001$; Japanese: $r(60) = .75$, $p < .001$].

We predicted that independently oriented Americans would easily associate personal

(rather than relational) verbs with positive (rather than negative) adjectives, resulting in shorter

response time in the personal + positive combination block than in the relational + positive

combination block. This effect was expected to be either weaker or reversed among

interdependently oriented Japanese.

Self-description task. When people describe themselves by completing sentences

starting with "I am…" (Twenty Statement Test; Kuhn & McPartland, 1954), European Americans

are more likely to list personal attributes and traits and less likely list social roles and relational

identities than Asians (Brewer & Yuki, 2007; Cousins, 1989). In a shortened version of the self-

description task, participants were asked to complete five sentences describing themselves.

Two raters in each culture classified the descriptions as 1) personal identity (e.g., I am

extroverted; I am intuitive), 2) social/collective identity (e.g., I am a student at the University of

Michigan; Family is very important to me), or 3) other (I am a human being; I am human, just

like others).[1] We examined the proportion of personal identities compared to social/collective

identities listed by participants as an implicit indicator of independence. The inter-rater reliability

was high both in the U.S. (K = .77) and in Japan (K = .78).

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[1] Participants made very few statements that belonged to the other category (0.003%) and the cultural groups did not differ in the number of self-descriptions in this category, $F(1, 115) = 2.15$, $p = .15$, $\eta_p^2 = .02$.

Salience of disengaging (vs. engaging) emotions. The implicit social orientation questionnaire (ISOQ; Kitayama & Park, 2007) was used to assess the relative salience of socially disengaging (vs. engaging) emotions in daily life. Participants were asked to recall 10 mundane social situations (e.g., waiting to be seated at a restaurant) and then to report how strongly (1 = *not at all*, 6 = *very strongly*) they experienced each of 10 different emotions that varied in social engagement (disengaging vs. engaging) and valence (positive vs. negative). In previous studies (Kitayama, Mesquita, & Karasawa, 2006; Kitayama et al., 2009), European Americans experienced disengaging emotions (self-esteem, proud, frustration, anger) more strongly than engaging emotions (close feelings, friendly feelings, shame, guilt), whereas Asians experienced engaging emotions more strongly than disengaging emotions. We thus used the relative intensity in experiencing disengaging versus engaging emotions as an index of implicit independence. The index was computed by averaging the intensity ratings across 10 situations for disengaging emotions and engaging emotions separately.

Predictors of happiness. We also used the ISOQ to assess whether happiness was correlated more strongly with disengaging or engaging positive emotions for each individual. Previous studies show that Americans' happiness is better predicted by the relative experience of disengaging (vs. engaging) positive emotions, whereas Japanese's happiness is better predicted by the experience of engaging (vs. disengaging) positive emotions (Kitayama et al., 2006, 2009). To assess the extent to which disengaging vs. engaging positive emotions predict happiness, we computed the mean rating scores for happiness, disengaging positive emotions, and engaging positive emotions for each participant separately for each situation. Then, we regressed the happiness score on the relative strength of experiencing disengaging (vs. engaging) positive emotions (i.e., disengaging positive – engaging positive) for each participant.

The standardized regression coefficient was our measure of implicit independence. A higher number indicates that one's happiness is better predicted by the experience of disengaging relative to that of engaging positive emotions.

Explicit Measures

We tested two indicators of explicit independence and interdependence: Self-construal scale and semantic differential scale.

Self-construal scale. Participants filled out a 20-item self-construal scale used in prior work (Park & Kitayama, 2014). This scale was composed of selected items from both Singelis (1994) and Takata (1999) scales. The intent was to assess different aspects of independence and interdependence that are covered in the two different, although conceptually related scales. Participants rated the extent to which they agreed to each item (1 = *strongly disagree*, 5 = *strongly agree*), which yielded separate scores for independent self-construal (αs = .79 and .71, for European Americans and for Japanese, respectively) and interdependent self-construal (αs = .67 and .65).

Semantic differential scale. Participants read five target words about social relationships (human relationship, social interaction, human bond, communication, social activities), and rated their attitudes about these words on a 7-point scale between two bipolar adjectives (e.g., from -3: *bad* to +3: *good*). Seven bipolar pairs of adjectives were used as rating domains (bad – good, weak – strong, passive – active, unpleasant – pleasant, cold – warm, tense – relaxed, uncomfortable – comfortable). Separately for each target word, we summated the adjective ratings across seven rating domains. These scores were then averaged across the five target words (αs = .88 and .75, for European Americans and for Japanese, respectively).

<div align="center">

Results

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IAT

We predicted that Americans would show more favorable implicit attitudes toward the personal (vs. relational) self than Japanese. One American participant's data was lost due to the program malfunction. Additionally, we excluded 7 outliers (2 Americans and 5 Japanese) whose response time exceeded two standard deviations from each cultural group mean, which left 109 participants (54 Americans and 55 Japanese) to be included in the analysis. Following Greenwald et al. (1998), we 1) exclude first two trials from each test block, 2) recoded latencies outside of lower (300ms) and upper (3000ms) boundaries to 300ms and 3000ms, respectively, and 3) log-transformed them before averaging them within each block.[2] The resulting values were submitted to a 2 (Culture [Americans vs. Japanese]) x 2 (Combination [personal + positive vs. relational + positive]) x 2 (Order [personal + positive combination first vs. relational + positive combination]) ANOVA with culture and order as between-subjects factors and combination as a within-subjects factor.

First, Japanese were overall faster (M = 2.87, SD = .06) than Americans (M = 2.92, SD = .06), $F(1, 105)$ = 20.90, $p < .001$, η_p^2 = .17, as typically shown in cross-cultural work using relatively simple cognitive tasks (e.g., Ishii et al., 2003; Na & Kitayama, 2011). The main effect of block was also significant, $F(1, 105)$ = 15.47, $p < .001$, η_p^2 = .13, suggesting that when cultural groups were collapsed, people were faster in associating the personal self with positive words (M = 2.88, SD = .05) than associating the relational self with positive words (M = 2.92, SD = .06). But, importantly, these effects were qualified by the expected Culture x Combination

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[2] We also computed D score based on the algorithm suggested by Greenwald et al. (2003). The higher number on this index indicates a stronger preference for the personal (vs. relational) self. When we examined this index, we found a consistent, but weaker cultural difference. Americans tended to show greater D score (M = .26, SD = .70) than Japanese (M = .14, SD = .63), $F(1, 105)$ = 1.78, p = .18, η_p^2 = .02.

interaction, $F(1, 105) = 3.81$, $p = .05$, $\eta_p^2 = .04$. Americans were significantly faster in the personal + positive combination block ($M = 2.89$, $SD = .09$) than in the relational + positive combination block ($M = 2.95$, $SD = .11$), $F(1, 53) = 8.41$, $p < .01$, $\eta_p^2 = .14$, suggesting that they have stronger evaluative associations between the personal self and positive words than associations between the relational self and positive words. However, Japanese' latencies did not differ across the two combination blocks (personal + positive combination: $M = 2.86$, $SD = .07$; relational + positive combination: $M = 2.88$, $SD = .08$), $F(1, 54) = 2.17$, $p = .15$, $\eta_p^2 = .04$. The order did not interact with this effect, $F(1, 105) = .03$, $p = .87$.

In an additional analysis, we also tested error rates, which showed a similar cultural difference. Overall, Japanese made fewer errors ($M = 8.09$, $SD = 6.40$) than Americans ($M = 11.95$, $SD = 6.40$), $F(1, 105) = 9.88$, $p < .01$, $\eta_p^2 = .09$. Importantly, this effect was qualified by a Culture x Combination interaction, $F(1, 105) = 3.29$, $p = .07$, $\eta_p^2 = .03$. Americans made fewer errors when associating the personal self with positive words ($M = 10.58$, $SD = 8.71$) than when associating the relational self with positive words ($M = 13.26$, $SD = 10.06$), $F(1, 53) = 3.48$, $p = .07$, $\eta_p^2 = .06$, while Japanese' error rates did not differ across the blocks (personal + positive combination: $M = 8.10$, $SD = 6.04$; relational + positive combination: $M = 8.07$, $SD = 5.79$), $F(1, 54) = .001$, $p = .97$. This is consistent with the patterns typically shown in IAT studies (e.g., Greenwald et al., 1998) that people tend to make more errors in conditions in which they make slower responses. As would be expected from this pattern of the results, the IAT score computed based on latencies was highly correlated with the IAT score computed based on error rates, $r(109) = .52$, $p < .001$ [European Americans: $r(54) = .54$, $p < .001$, Japanese: $r(55) = .45$, $p = .001$].

Other Implicit Tendencies

We further examined additional measures of implicit independence to see whether Americans were more independent (or less interdependent) than Japanese as in the Kitayama et al. (2009) study.

Self-description task. The proportion of descriptions in each category was submitted to a 2 (Culture) x 2 (Category [personal identities vs. social/collective identities]) mixed ANOVA with culture as a between-subjects factor and category as a within-subjects factor. The Culture x Category interaction was significant, $F(1, 115) = 10.91$, $p = .001$, $\eta_p^2 = .09$. As expected, Americans listed more descriptions pertaining to personal identities ($M = .74$, $SD = .23$) than Japanese ($M = .60$, $SD = .25$), $F(1, 115) = 10.27$, $p < .01$, $\eta_p^2 = .08$, while Japanese referred to social/collective identities more ($M = .40$, $SD = .25$) than Americans ($M = .25$, $SD = .22$), $F(1, 115) = 11.51$, $p = .001$, $\eta_p^2 = .09$.

Salience of disengaging (vs. engaging) emotions. We performed a 2 (Culture) x 2 (Emotion type [disengaging vs. engaging]) ANOVA with culture as a between-subjects factor and emotion type as a within-subjects factor. Main effects of both culture and emotion type were significant, $F(1, 115) = 4.69$, $p = .03$, $\eta_p^2 = .04$, and $F(1, 115) = 19.48$, $p < .001$, $\eta_p^2 = .15$, respectively. These main effects were qualified by the Culture x Emotion type 2-way interaction, $F(1, 115) = 13.96$, $p < .001$, $\eta_p^2 = .11$. Americans experienced disengaging emotions more strongly ($M = 2.45$, $SD = .58$) than engaging emotions ($M = 2.11$, $SD = .42$), $F(1, 56) = 26.67$, $p < .001$, $\eta_p^2 = .32$, while Japanese experienced both emotion types equally (engaging: $M = 2.09$, $SD = .40$; disengaging: $M = 2.12$, $SD = .52$), $F(1, 59) = .30$, $p = .59$.

Form of happiness as personal (vs. social). We then examined the relative extent to which disengaging versus engaging positive emotions predicted happiness. The standardized coefficient of the relative strength index (disengaging positive – engaging positive) in predicting

happiness was significantly greater for Americans (M = -.32, SD = .41) than for Japanese (M = -.48, SD = .40), $F(1, 115)$ = 4.24, p = .04, η_p^2 = .04. This suggests that the relative experience of disengaging (vs. engaging) positive emotions predicts Americans' happiness more strongly than Japanese' happiness.

Explicit Measures

The results so far suggest that Americans were indeed more independent (or less interdependent) than Japanese in all implicit measures. We further tested explicit indicators.

Self-construal scale. Consistent with what we observed in implicit measures, Americans were more independent (M = 3.78, SD = .67) than Japanese (M = 3.18, SD = .61), $F(1, 115)$ = 26.31, p < .001, η_p^2 = .19. Two cultural groups, however, did not differ in their interdependence although there was a slight trend toward Japanese being more interdependent (M = 3.60, SD = .51) than Americans (M = 3.45, SD = .52), $F(1, 115)$ = 2.66, p = .11. η_{p0}^2 = .02.

Semantic differential scale. Counter to what would be expected, Americans exhibited more favorable explicit attitudes toward relationships (M = 11.87, SD = 5.21) than Japanese did (M = 6.77, SD = 4.79), $F(1, 114)$ = 30.09, p < .001, η_p^2 = .21.

Correlations among the Implicit Measures

The findings so far suggest that implicit tendencies clearly differentiate the two cultural groups, while explicit indicators do not. Americans were more independent (or less interdependent) than Japanese when their implicit tendencies were examined. However, cultural difference was either non-significant (as in the interdependent self-construal scale) or was the opposite of what would be expected (as in the semantic differential scale) when explicit indicators of independence were examined.

Next, we examined correlations among the four implicit indicators, which systematically differentiated the two cultural groups. We converted data so that positive scores signified greater implicit independence. Specifically, this included 1) the IAT score (the relational + positive combination latencies – the personal + positive combination latencies), 2) the proportion of personal (vs. social) identity descriptions in the self-description task, 3) the experience of disengaging (vs. engaging) emotions, and 4) personal (vs. social) happiness. As can be seen in Table 2, the correlations among the measures are close to zero in each culture. The mean correlation across the four measures was negligible both for Americans (r = .07) and for Japanese (r = .09). Out of twelve possible correlations, only one was statistically significant. The IAT score was positively correlated with the experience of disengaging (vs. engaging) emotions among Japanese, $r(55)$ = .31, p = .02, indicating that those who showed a stronger preference for the personal self over the relational self also experienced more disengaging emotions than engaging emotions in daily lives.[3] However, this correlation was not replicated among Americans, $r(54)$ = .02, p = .87.

Discussion

The present study was the first to test *implicit attitude* toward independence. We also tested three additional measures of implicit independence, namely, the proportion of personal (vs. social) identity descriptions in the self-description task, the experience of disengaging (vs. engaging) emotions, and personal (vs. social) happiness. As predicted, across these four

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[3] There was a significant correlation between our IAT measure and the measure assessing the salience of disengaging vs. engaging emotions among Japanese participants. This finding may be taken as evidence for the convergent validity of our IAT paradigm. Caution is due, however, because the same correlation was not observed among Americans. Moreover, there was no such correlation with other implicit indicators of independence. Future research should test psychometric properties of the current IAT paradigm (e.g., Cunningham, Preacher, & Banaji, 2001).

implicit measures, Americans were relatively more independent (vs. interdependent) than Japanese. In addition, as also replicating previous evidence, explicit indicators of independence showed inconsistent cross-cultural patterns. First, in self-construal scale, Americans were more independent than Japanese, whereas the pattern was reversed for interdependence but only non-significantly. Although the pattern is consistent with the notion that Japanese are relatively more interdependent or less independent than Americans, a similar pattern is not always observed (Kitayama et al., 2009; Oyserman et al., 2002). Moreover, the semantic differential scale, another explicit measure of independence, showed a stronger relational tendency for Americans than for Japanese.

Importantly, as in the Kitayama et al. (2009) and Na et al. (2010) studies, we found little statistical coherence among the implicit measures of independence within each cultural group. This was the case despite the fact that these measures systematically differentiated the two cultural groups. To illustrate this point, we created profiles of implicit independence (vs. interdependence) for our study participants. First, we created profiles for each cultural group on the basis of the overall group mean of implicit independence vs. interdependence (see Figure 1-A for American group and Figure 1-B for Japanese group). The four poles of each figure indicate the standardized scores on the four implicit measures of independence. Positive (or negative) scores imply greater tendencies toward independence (or interdependence) (-2: *highly interdependent*, +2: *highly independent*). The resulting diamonds for American group tend to be "larger" than the ones for Japanese group. Next, to illustrate the point that individuals vary in their specific profiles of implicit independence vs. interdependence, we randomly selected two study participants in each cultural group among those who were identical in their mean levels of independence across the four tasks (.56 for the American participants and -.38 for the Japanese

participants) and presented their individual profiles. The two American participants shown in

Figures 1-C and D are identical in their overall levels of independence and, yet, the exact shape

of their diamonds is very different. The same applies to two Japanese participants illustrated in

Figures 1-E and F. These findings are consistent with a view that individuals pursue their

cultural imperative of independence or interdependence differently and, depending on how they

try to be independent or interdependent, they are likely to be high in *different* aspects of

independence or interdependence (Kitayama et al., 2009).

As in previous work, we found that explicit measures of social orientation show

inconsistent cross-cultural patterns. It is possible that the explicit measures are influenced more

by social desirability. This kind of social desirability is likely to be highly dependent on specific

socio-historical contexts. For example, in recent Japan, highly individualistic norms were

brought in from the West, which might have made independence highly desirable. Accordingly,

it is not surprising that independence is sometimes more desirable for Japanese, whereas

interdependence is more desirable for Americans. Social desirability, however, is less likely to

influence implicit psychological tendencies. At this, more tacit, implicit level, a more traditional,

community-oriented, interdependent mode of being may be largely preserved (Toivonen,

Norasakkunkit, & Uchida, 2011).

Limitations and Future Directions

A few caveats should be noted. First, our analysis could be interpreted to imply that

European Americans would be independent (rather than interdependent) whereas Japanese

would be interdependent (rather than independent). Our data suggest that this inference might

not be always valid. For example, both cultural groups were more or less interdependent in the

predictors of happiness measure although Americans were less so as compared to Japanese.

Similarly, both cultural groups were more or less independent in the self-definition task although this effect was more strongly pronounced for Americans than for Japanese. Perhaps, the overall level of independence or interdependence is influenced by a variety of factors such as specific social situations or contexts and individual differences, although one might anticipate powerful influences of culture above and beyond such extraneous variables.

Second, all of the implicit measures we tested pitted independence against interdependence. This, however, was not the case for one of our explicit measures, which focused only on interdependence (i.e., explicit attitudes toward social relationships assessed with the semantic differential scale). Future work should include semantic differential measures for independence in addition to interdependence.

Third, our analysis falls short of identifying factors that influence the specific individual profiles of implicit independence. That is, although we provided clear evidence that the size of the diamonds in Figures 1-A and B are influenced by culture, our data offered no clue regarding what determined the specific shape of each individual profile. Future work should add the more fine-grained issue of individual differences in the profiles of independence or interdependence.

To conclude, the current work adds to previous evidence documenting that culture varies systematically in implicit independence or interdependence. It also suggests that explicit measures are less reliable as markers of cultural difference. One significant area of research is to extend our finding on implicit attitudes to examine whether this aspect of implicit independence might be different from other aspects of independence, and if so, how. Another important direction of research is to follow up on recent cultural neuroscience approaches (Kitayama, Part, & Choi, in press; Kitayama & Uskul, 2011) to use neural as well as behavioral

indicators of independence and interdependence, and see if the results from these measures would converge.

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Table 1

Illustration of the IAT

Condition 1	Left Key	Right Key
Block 1 (practice)	Positive adjectives	Negative adjectives
Block 2 (practice)	Personal verbs	Relational verbs
Block 3 (practice)	Personal verbs + Positive adjectives	Relational verbs + Negative adjectives
Block 4 (critical)	Personal verbs + Positive adjectives	Relational verbs + Negative adjectives
Block 5 (practice)	Relational verbs	Personal verbs
Block 6 (practice)	Relational verbs + Positive adjectives	Personal verbs + Negative adjectives
Block 7 (critical)	Relational verbs + Positive adjectives	Personal verbs + Negative adjectives
Condition 2	Left Key	Right Key
Block 1 (practice)	Positive adjectives	Negative adjectives
Block 2 (practice)	Relational verbs	Personal verbs
Block 3 (practice)	Relational verbs + Positive adjectives	Personal verbs + Negative adjectives
Block 4 (critical)	Relational verbs + Positive adjectives	Personal verbs + Negative adjectives
Block 5 (practice)	Personal verbs	Relational verbs
Block 6 (practice)	Personal verbs + Positive adjectives	Relational verbs + Negative adjectives
Block 7 (critical)	Personal verbs + Positive adjectives	Relational verbs + Negative adjectives

Table 2

Correlations among the four implicit measures of independence

Americans	1	2	3		4
1. IAT score		.19	.02		-.01
2. Personal vs. social self-descriptions			-.11		.19
3. Salience of disengaging vs. enginag emotions					.11
4. Form of happines as personal vs. social					
Japanese	1	2	3		4
1. IAT score		-.03	.31	*	-.11
2. Personal vs. social self-descriptions			.16		.17
3. Salience of disengaging vs. enginag emotions					.05
4. Form of happines as personal vs. social					

Note. 57 Americans and 60 Japanese except for the IAT score (ns = 54 and 55, respectively).
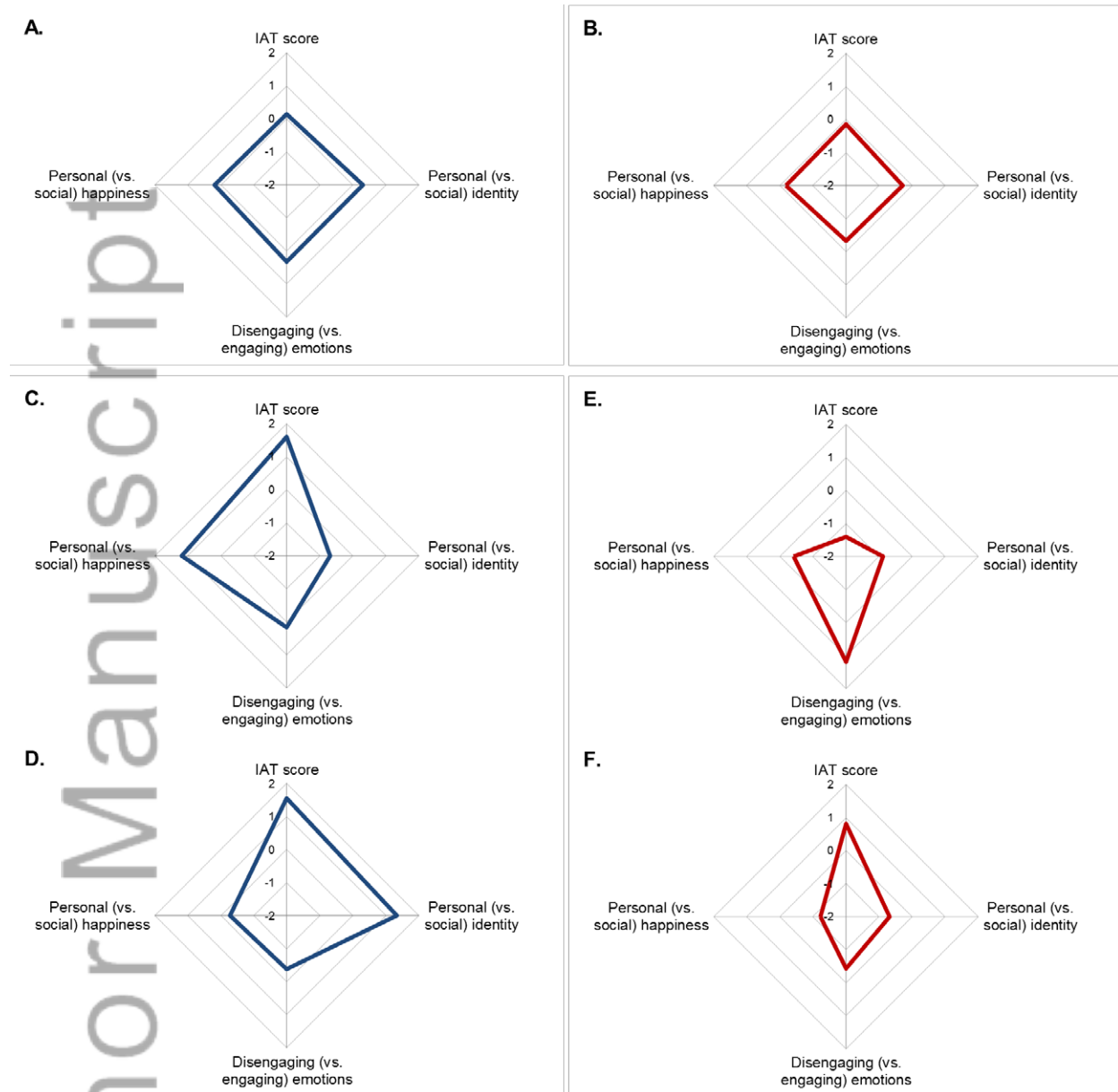
*p < .05.

Figure 1. Profiles of implicit independence vs. interdependence for American group (A) and Japanese group (B). Figures C and D are individual profiles of two American participants and Figures E and F are individual profiles of two Japanese participants.

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Cultural Variation in Implicit Independence:

An Extension of Kitayama et al. (2009)

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