

## Asian culture in transition: is it related to reported parenting styles and transitivity of simple choices?

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### Abstract

Does culture shape reported parenting styles and cognitive processes like transitive reasoning, of choosing A over B, B over C, and then A over C (transitivity)? Asian-American, Caucasian-American, and Indian university students differed significantly in transitivity and in reported parental styles. India participants were more intransitive and, contrary to traditional findings in the literature, reported their parents as more laissez-faire, individualistic, and competitive than did Caucasian-Americans. Recent technological and industrial advances in India likely explain some of these obtained differences. Predictions from Adlerian theory and work of Kurt Lewin, that parenting styles would relate to transitivity of choices, were indirectly supported. Stronger evidence was found that culture impacts both reported parental styles and transitivity of simple choices.

Culture has long been known to affect human action, emotion, and thought (Ferguson, 2000; Kimmelmeier, Burnstein, & Peng, 1999; Peng, Ames, & Knowles, 2001; Peng & Nisbett, 1999, 2000; Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009; Triandis, 1995). For instance, Asians compared to Western Caucasians have a different understanding of many aspects of social life (Harrington & Liu, 2002; Heinke & Louis, 2009; Hofstede, 2007; Hung & Liu, 2000; Liu, Ng, Loong, Gee, & Weatherall, 2003), which may impact the ways parents train their children and the values they hold for their children's behaviors and thought (Parmar, Harkness, & Super, 2004). Asians also tend to think more holistically and dialectically (Morris & Peng, 1994; Nisbett, Peng, Choi, & Norenzayan, 2001) and are more likely to think in terms of a collective "we" compared to the Western Caucasian focus on "I" (Oyserman & Lee, 2008). Although much is known about the effect of culture on cognitions and behaviors (Gardner, Gabriel, & Lee, 1999; Kitayama & Cohen, 2007; Maass, Karasawa, Politi, & Suga, 2006; Morris & Peng, 1994; Oyserman & Lee, 2008; Peng & Nisbett, 1999; Schwartz, 2000), many effects of culture on human thought and decision making are still poorly understood.

Noteworthy is the fact that little is known about the influence of culture on *transitivity of preferences* in simple personal

choices. Transitivity reflects an early stage of cognitive development, when children learn to reason and to make choices in an orderly fashion. They understand that if they select A to be larger than B, and B is selected as larger than C, then A also must be selected as larger than C. That is transitivity. Transitivity compared to intransitivity of one's preferences (Tversky, 1969) affects daily living in all spheres of life, from sometimes trivial consumer actions to life-altering choices involving career paths and mate selection (e.g., Kirchsteiger & Puppe, 1996). Generally speaking, three approaches have been used to study transitivity. The first concerns a Piagetian focus on the cognitive development of the child (Holcomb, Stromer, & Mackay, 1997; Markovits & Dumas, 1999) in which transitivity was found to develop in the preschool and early school years when the child gains a grasp of order relationships (in terms of length, size, and other attributes of objects involving magnitude). The second, evolutionary approach involves comparisons between humans and lower animals (e.g., Tomasello, 2000). Specific studies have addressed whether animals display transitivity of choices and whether they can learn order relationships via operant conditioning procedures (e.g., Sumpter, Temple, & Foster, 1999). A third approach, which does not bear on the present investigation, deals with transitivity in language (such as the use of

transitive and intransitive verbs, e.g., Guest, Dell, & Cole, 2000). In both developmental and evolutionary psychology, transitivity is an important and basic cognitive process, and it is one that may be influenced by culture. As noted above, differences in human reasoning have been found across cultures, and such differences may also be found with regard to the rates of transitivity in simple binary choice tasks.

In the more specific culture of an individual family, there are moreover strong theoretical reasons (Dreikurs, 1949, 1995; Lewin, 1948) to predict that specific family patterns of childhood could also affect an individual's forms of reasoning, especially with respect to orderly relationships. Adler (1930, 1931, 1933), Dreikurs (1949, 1980; Dreikurs & Soltz, 2002) and Erikson (1959) indicated that parents' style in family interactions affect children's views of life, and these views have long-term effects on personality (Ferguson, 2010) and on the later adults' thoughts, actions, and emotions. The present investigation focuses on retrospections rather than on the actual values and practices the respondent's parents held during the respondent's childhood. Use of retrospective reports of parental values and practices has been of interest for understanding parenting styles (e.g., Sabbatini & Leaper, 2004). If parenting styles impact transitivity, this effect may have particular consequences. For instance, Ferguson (1971) showed that transitivity of simple choices had clear cognitive implications, in that students with higher college aptitude test scores had significantly greater transitivity in their choices than did students with lower test scores.

Given the importance of transitivity and the considerations above, the purpose of the present investigation is to determine if an orderly (transitive) way of making choices is a cognitive process influenced not only by intellectual skills but also by culture and by perceived parenting styles. More specifically, we predicted that fundamental values learned in childhood from one's family, as well as culture, impact an adult's cognitive style as measured by a simple test of transitivity. Because every family is nested within a broader culture, we also expected parental values and parenting styles to vary across cultures. The present investigation therefore compared university students in three distinct communities: Two American groups with different cultural and socioeconomic backgrounds, and an upward-mobile group in India. Our overall method involved testing one large sample of West Coast U.S. students, several samples of Midwestern U.S. students, and several samples of Indian students. All groups received the transitivity (TR) task and the parental background scale. The TR task contained 16 pairs of items. Six items were paired once with every other item for 15 pairs, and as an internal reliability check, pair number 8 repeated the same items as pair number 1. Within a given TR task, all TR items contained a quantity dimension (e.g., 1, 2, or 3 weeks

of vacation) and a quality dimension (e.g., London vs. Bermuda for vacation).

The parenting background scale (Ferguson & Peng, 2000) contained parental values reported retrospectively by participants (and for some samples, the participants also reported retrospectively their parental practices). Participants indicated what they believed their parents' values were when the participants were children prior to the age of 9 years. According to Adlerian theory (Dreikurs, Cassel, & Ferguson, 2004; Ferguson, 2010), how the child apperceives family patterns during the formative years shapes the long-term personality of the individual. Although this usually refers to the first 6 years of life, impressions up to the age of 9 also may leave long-term effects on cognitions and emotions. We tested for the parental patterns (autocratic, democratic, laissez-faire) described by Lewin, Lippit, and White (1939). A 15-item scale, reported by Ferguson, Hagaman, Grice, and Peng (2006), was used in the initial tests, and later tests used a longer 40-item scale that had been factor analyzed and proven reliable. In addition to the 15-item or the 40-item scale, in some of the testing, the participants also made global choices that required the participants to select which one of three parental value descriptions best represented their parents' values up to their childhood age of 9 years.

Of particular interest regarding the present investigation are comparisons involving the Indian students. India has gone through a major technological evolution, and this could change the traditional autocratic values reported by its families (Dasgupta, Hennessey, & Mukhopadhyay, 1999; Tisdell, Roy, & Regmi, 2001). In line with the theoretical perspective of Dreikurs (1995) and Lewin (Lewin et al., 1939), if the Indian students did report more autocratic parenting, which emphasizes following rules in an orderly fashion, the choices of the Indian students should be more transitive than those of North Americans. However, if the Indian sample reported more laissez-faire parenting, as would be expected in a more competitive market society toward which India was moving, we predict they will reveal more intransitive choices on the TR task.

In summary, in the two studies reported below, the participants completed a transitivity task that measured how transitive or intransitive their paired-comparison choices were for items that differed in quantity and quality. The participants also completed a parental background scale in which they gave retrospective reports of what they thought their parents valued in terms of autocratic, democratic, or laissez-faire beliefs. The aim of both studies was to assess (a) whether in different cultures, young adults report different parental backgrounds in terms of autocratic, democratic, or laissez-faire characteristics, and (b) whether persons from Euro-Caucasian background show different patterns of transitivity on simple personal choices than do persons from Asian (including

Indian-Asian) background. It was predicted that culture would have two distinct effects, one on reported parental background and one on amount of transitivity shown when people make simple personal choices.

## Study 1

### Method

#### Participants

In the academic years 2000–2002, three different university samples, with different cultures, were tested: The Midwest samples consisted primarily of Euro-Caucasian students at a midsized state university at which mostly in-state students attend; a West Coast sample consisted of Asian and Euro-Caucasian participants (as well as students of various other ethnic backgrounds) at a very large state university at which many international and out-of-state students attend; and an Indian sample containing Indian-Asian participants at a prestigious university at which students from many parts of India attend.

To permit comparison between the Midwest participants and the Indian samples, 46 Midwest participants (37 women and 9 men, aged 17 to 22 years) were randomly selected from a larger 249-person sample, with the random sample matching the parental background distribution of the larger total group tested in fall 2000 and spring 2001. In fall of 2001 and spring of 2002, a second random sample of Midwest students was selected from a larger study of 331 participants, and these 44 persons (36 women and 8 men, aged 18 to 21 years) matched the parental background distribution of that larger total group.

The West Coast sample had 52 Caucasian and 113 Asian participants (the remainder being a mixture of ethnicities). The first sample at the university in Pune, India, did not receive the transitivity test but did report parental values and practices. The first sample contained 46 individuals (43 women and 3 men), and the second sample had 44 persons (18 women and 26 men). The India participants were between the ages of 16 and 20 years. The religion of the majority of participants in the West Coast and Midwest samples was Christian, whereas the religion of most participants in the Indian samples was Hindu.

#### Materials and procedures

Participants, tested in small groups, first received the transitivity (TR) task. The pairs of items, in various combinations, gave choices between 1, 2, or 3 weeks of vacation spent in London versus Bermuda for the U.S. samples, and London vs. Hawaii for the Indian samples (because the Indian students were more familiar with Hawaii than Bermuda, this assured

comparable familiarity and valences for all the samples). Participants checked which one of the two items per pair they preferred. Transitivity, as internal consistency of the pair-comparison choices, was based on five triads of comparisons. The underlying strategies were identified but did not affect the transitivity count. A common strategy was that “more” was preferred over “less” and London was preferred over Bermuda (or Hawaii). Any strategy could be transitive as long as all the triplets had internal consistency. The dependent variable of importance was the number of intransitive choices. Scores of intransitivity ranged from “0” (*all choices were transitive*) to 5 (*choices were made in a completely chaotic fashion*), and for all samples, the TR data were positively skewed. Thus, although mean TR scores could be compared across samples, a two-category (transitive vs. intransitive) comparison was a sound and meaningful way to compare samples for the TR data.<sup>1</sup>

Following the TR task, participants received the Parental Values (PV) scale that asked for ratings on 15 items as described by Ferguson et al. (2006). The earlier report on the scale (Ferguson et al., 2006) concluded that the three significant factors were not the same as those reported by Lewin et al. (1939) but rather involved a combination of democratic and laissez-faire items (along with autocratic and individualistic factors). However, the earlier results were all based on Caucasians from a midsized Midwestern University. Thus, for the present investigation that used culturally diverse participants, we decided to use the same 15 items to represent the original three categories.

As in the Ferguson et al. (2006) investigation, five items each were intended to measure autocratic, democratic, and laissez-faire categories. A high score on each item denoted a strong parental value reported for a given category. The participants were asked to describe their parents' values (beliefs and values the parents wanted the child to adopt) during childhood (prior to age 9) on a scale from 1 (*not at all, never*) to 7 (*very much, actively valued*). The test items were randomly dispersed in terms of categories. Democratic values were *fair play, mutual respect between people* (peers and adults), *creativity and originality in thought, empathy towards*

<sup>1</sup>Transitivity of choices with pairs involving both quantity and quality will be partially dependent on the overall preferences between the contents, in that weak preferences can lead to indifference and thus to intransitivity. Some of the West Coast participants, in addition to the vacation-content task, also received another form of the TR task, in which the participants had to choose between 30, 20, or 10 books vs. 30, 20, or 10 CDs (in various combinations). The participants checked which one of the two items per pair they preferred. West Coast university students who had the two transitivity tasks in a package that contained other tests showed a significant correlation between the two transitivity tasks, and a chi-square test of independence ( $\chi^2$ ) showed that if the person was transitive on one task, the person was also more likely to be transitive on the other task. The choice of books versus CDs involves a completely different domain than does choice of vacations, which provides evidence that transitivity generalizes across domains.

others, and peaceful negotiation. Laissez-faire values were pursuit of personal wishes, what matters is appearance and good impressions, freedom in action, being different and distinctive, and doing what is best for oneself. Autocratic values were obedience to authority, conformity to rules, aggression as a means of solving problems, competitive superiority and being the best, and winning is everything.

The PV scores identified which style was dominant (autocratic, democratic, or laissez-faire). If the person's responses showed no one dominant parental value, that person's parental values data were not included in the PV analysis. A parental practices (PP) scale had the same items but asked the participants for their parents' practices instead of parental values prior to the participant's age of 9 years. The major emphasis in the present investigation was on the PV task, but the PP task was given in order to identify how generalizable the findings were from the PV task.

After the West Coast sample and the first Indian sample were tested, the second Indian sample and the two Midwest samples were tested and received additional questions that required global parent background assessments. This permitted cross-validation with the PV items. The three choices for global parental values, for which the participants identified the best fitting one, were as follows. "A. Generally, my parents emphasized that one should do what one feels like, to follow one's own path—without focusing on the rules." "B. Generally, my parents emphasized that one should work with others with mutual support and mutual respect." "C. Generally, my parents emphasized that one should follow the orders and rules set by those in authority." The three global statements for practices were similar to those for values, and participants indicated which one most closely expressed the practices of the student's parents.

## Results

### Reported parental background

Regarding the first question, Asians differed significantly from Euro-Caucasian participants in reported parenting styles. This is in line with the literature that found Asians differing from Euro-Caucasians in their general styles of parenting (e.g., Chao, 2000; Chao & Tseng, 2002; D'Cruz & Bharat, 2001). Regarding the second question, transitivity differed significantly for the Asian than the Euro-Caucasian participants. Regarding the third question, a complex relationship was found between transitivity and reported parenting background.

Regarding the first question of different parenting styles for different ethnicities, results indicated that reported parental values differed (a) within a given location (such as Asians differing from Euro-Caucasian students in the West Coast university), (b) across locations within the same country (i.e., West Coast compared to Midwest), and (c) between countries that had different ethnicity (i.e., United States compared to India). Some of the results are shown in Table 1 and Table 2.

An example of an important difference was that Asian West Coast participants reported more autocratic parenting than the Caucasian West Coast participants,  $\chi^2 (2 df) = 10.70, p = .005$  for parental values, and  $\chi^2 (2 df) = 8.94, p = .011$  for parental practices. Additionally, in mean parental value scores, the Asians had significantly higher mean reported autocratic parental values, and lower reported democratic parental values, than did the Caucasian students. For autocratic parental values, the means were 4.34 vs. 2.47,  $t (189) = 6.74, p < .001, d = 1.03$ . For democratic values, the means were 6.41 vs. 8.16,  $t (189) = 5.75, p < .001, d = .87$ .

**Table 1** Frequency of Dominant Parental Values Reported for West Coast, Midwest, and India Participants

	Autocratic	Democratic	Laissez-faire
West Coast Asian	24	72	25
West Coast Caucasian	4	57	9
West Coast total (A + C + "other" <sup>a</sup> )	31	152	40
Midwest 1	7	148	57
Midwest 2	1	34	5
India 2	3	22	13

<sup>a</sup>"Other" refers to ethnicities besides Asian and Euro-Caucasian (e.g., African Americans, South Sea Islanders, Native Americans).

**Table 2** Frequency of Parental Values for PV Scale (Dominance) and Global Measure for Indian Sample 2 and Midwest Sample 2 Participants

	Autocratic Dominance global		Democratic Dominance global		Laissez-faire Dominance global		$\chi^2$ Dominance	$\chi^2$ global
India 2	3	6	22	26	13	12	7.08 ( $p = .029$ )	
Midwest 2	1	16	34	22	5	6		6.88 ( $p = .032$ )

Using Cohen's conventions for this effect size measure, these are large effects. No significant difference was found for laissez-faire scores.

The total West Coast sample, which included "other" ethnic groups as well as the Asian and Caucasian participants, reported autocratic parental values more frequently than did the first Midwest sample,  $\chi^2(2 df) = 17.92, p < .001$ , and this was due in part to the Asian participants. Moreover, the Caucasian students in the West Coast reported different parenting values than did the Caucasian Midwest participants, and the second Indian sample compared to the second Midwest sample had different frequencies of reported parental values,  $\chi^2(2 df) = 7.08, p = .029$ . Far more India participants reported laissez-faire, and far fewer reported autocratic, parental values than did the Midwest participants. In summary, the various groups showed significant differences. The West Coast Asians reported the most autocratic and the India participants reported the most laissez-faire parenting background. Parental practices overall mirrored the reported parental values, and global measures mirrored the dominance data. We had expected that more autocratic parental values were reported by West Coast students of Asian heritage compared to Caucasian students at that university. Additionally, the differences in reported parental values between persons of similar ethnic background in different parts of the United States matches what others have found (Cohen, 2009). That is, groups with similar ethnic backgrounds living in different regions of a country may report different family patterns, presumably because local cultural differences occur.

### Transitivity

Regarding the second question that pertains to whether culture affects transitivity, analyses showed the four groups differed significantly. A univariate analysis of variance was conducted using transitivity scores as the dependent variable and cultural backgrounds as the independent variable. The omnibus test results indicated that the four groups differed in transitivity scores,  $F(3, 434) = 13.5, p < .001, \eta^2 = .09$ . Post hoc tests (Tukey's honestly significant difference) showed that the Indian sample ( $M = 1.94$ ) differed from all United States samples (all  $ps < .05$ ). Within the United States, the Midwest sample was significantly more transitive than the West Coast Caucasians ( $M = .62$  vs.  $M = 1.07, p < .05$ ) but not the West Coast Asians ( $M = .62$  vs.  $M = .81, p > .05$ ). The two groups from the West Coast did not differ significantly from one another ( $M = .81$  vs.  $M = 1.07, p > .05$ ).

Further support that culture significantly affects transitivity was found when transitivity scores were regressed on cultural background and reported parental value scores in a two-step hierarchical regression analysis. The number of items scored as intransitive was entered as the dependent variable. Participants' reported parental values (dummy

coded) were entered as the independent variable on Step 1 and the culture variable (also dummy coded) entered on Stage 2 of the analysis. Initially, the model was not significant,  $F(2, 438) = .26, ns$ ; adjusted  $R^2$  change = .001.) However, with the culture variable included on Step 2, the model became a significant predictor of transitivity,  $F(5, 435) = 3.59, p = .003$ ; adjusted  $R^2 = .04, R^2$  change = .04). Examination of the regression coefficients revealed that only the sample from India predicted transitivity significantly when compared to the Midwestern sample (standardized  $\beta = -.19, p < .001$ ).

### Relationship between reported parenting values and transitivity

The results of the transitivity measure and the reported parenting values show the importance of culture on both transitivity and reported parenting values in answer to the first two questions. The third question pertained to the effect of reported parental values on transitivity. Participants with reported autocratic parental values tended to be more transitive, but separate  $t$ -tests and chi-square tests did not reveal significant effects in the mean intransitivity scores or the frequencies of transitivity versus intransitivity for the three reported styles of parenting. Because the regression analyses failed to show a significant effect of reported parental values on transitivity, the effect of culture on both reported parental values and transitivity of simple choices is clearly more powerful than the effect of parental values on transitivity.

### Discussion

The present study provides important insights. Ferguson (1971) originally reported that transitivity of simple choices was related to individual differences in cognition. Whereas Tversky (1969) had considered intransitivity in terms of error variance, Ferguson (1971) found transitivity versus intransitivity had individual differences characteristics, and the present study shows that transitivity of simple choices also can be altered by culture. The cultural differences were found in the present investigation not only between ethnic groups but also within Caucasians in different locations in the United States. Local cultural differences between the West Coast and Midwest participants are likely to explain the greater intransitivity of the West Coast compared to the Midwest participants. In the year 2000–2001, the West Coast culture was known for its "relaxed" rules and technological innovations. The year the data were collected, the region around the West Coast university experienced historic innovations in technology and biotechnology. No comparable development occurred in the Midwest university region. The less transitive responses of the West Coast participants compared to the Midwest participants meshes with what characterized the two cultures in the year 2000–2001. That transitivity varies with

culture needs to be understood both in terms of ethnic variation and in terms of more narrow local cultural differences.

Transitivity related in the predicted direction to parental values for the West Coast participants but was not related to parental values for the Midwest participants. The Midwesterners were overall highly transitive regardless of reported parental background. Thus, the results of Study 1 show that culture plays a large and direct role in what young adults report about their parental values during their early childhood, and culture plays a large and direct role in the degree of transitivity people display in simple personal choices, but parental values are only inconsistently related to transitivity. Further examination was thus undertaken with new samples to verify and extend these findings.

## Study 2

Study 2, conducted several years after Study 1, had a twofold purpose. One purpose was to replicate the findings of Study 1. The other was to assess if the data in this second study confirmed that young adults in technologically modernized India show patterns that deviate significantly from those cited in the earlier literature that had shown that Indian families traditionally followed autocratic and collectivistic patterns (Dasgupta et al., 1999; Tisdell et al., 2001). Study 1 indicated that these Indian patterns may be changing dramatically. Study 2 was done to verify and extend the findings of Study 1, and specifically to ascertain if the collectivistic pattern found traditionally in Asian families (Berry, Segall, & Kagitcibasi, 1997; Triandis, 1995) still occurs in India. The *laissez-faire* parenting reported by India participants in Study 1 suggested that collectivistic values may be replaced by individualistic and competitive patterns characteristic of a technologically and industrially developing society. Chadha and Husband (2006) and Heenan (2005) have described the enormous industrial, socio-economic, and technological changes that took place in India in recent years. Many studies show changes in Asian cultures that are significant (e.g., Seginer & Vermulst, 2002; Shaban, 2006; Vaidhya, 2003). Thus, Study 2 added three new categories for reported global parental values in addition to the three Lewin et al. (1939) categories used in Study 1. Two of the new categories, individualism and collectivism, were taken from Triandis (1995), and the third category, competitiveness, was derived from factor analysis done on data from the original 15-item studies (Ferguson et al., 2006). If the hypothesis is correct, that cultural changes due to the technological developments in India were reflected in the reported parental values, the Indian young adults in Study 2 would show more individualistic and more competitive, and less collectivistic, reported parental values compared to the Midwest young adults.

## Method

### Participants

In spring 2005, two sample of India participants were tested. One sample, India 1 participants ( $n = 48$ ), received the London versus Hawaii TR task. Because students in Pune were more familiar with Paris than Hawaii, a second sample, India 2 participants ( $n = 128$ ), received the London versus Paris TR task. Two Midwest samples were tested, one (Midwest 1) in the academic year 2003–2004 ( $n = 113$ ) and one (Midwest 2) in spring 2005 ( $n = 52$ ). Both Midwest samples received the London versus Hawaii TR task.

### Materials and procedures

For all participants in Study 2, the TR task had new quantities. Because informal verbal feedback indicated that some participants considered 3 weeks too long for vacations, the quantities became 3, 6, or 9 days in either London or Hawaii (or Paris for Indian Sample 2). To assess whether the higher intransitivity of the India participants in Study 1 was primarily due to the fact that the India participants were not as familiar with Hawaii as were the Midwest U.S. participants, comparison of India 1 and India 2 data (i.e., London vs. Hawaii, compared to London vs. Paris) would help resolve that question. India 2 and Midwest 2 participants received the TR task twice, with a month of time between testing. India 1 and Midwest 1 participants received the TR task only one time. Testing was done in small groups for all samples. The samples were similar in age and gender distributions to Study 1.

Study 2 used a 40-item inventory compared to the 15-item test used in Study 1. No parental practices test was given. The new Parental Values inventory had 10 items instead of 5 items for each of three categories (autocratic, democratic, and *laissez-faire* reported parenting values) plus a fourth category, competitive. Factor analysis of the parental scale had revealed that some of the items that were presumed to be autocratic were better categorized as competitive. Thus, the 40-item scale permitted the construction of a more pure set of factor-relevant items. Examples of competitive items are “winning is everything,” “being the best over others,” “defeat is unacceptable.” Dominance scores were obtained as in Study 1, each participant’s answers leading to a score for each of the categories. Dominance represented the parental values that received the highest score for each person. If a “split” occurred, of two or more categories receiving the same score, data for such participants were not included in the analyses for parental categories.

The Global Parental Values test that asked which parental value the parent most advocated (autocratic, democratic, or *laissez-faire*) was again administered, and for Study 2, three

new categories were added. These were individualistic (“My parents emphasized that one does better work when one works on one’s own and one should mainly rely on oneself”), collectivistic (“My parents emphasized that satisfaction comes from friends and relations, and that one does better work when one is with others”), and competitive (“My parents emphasized that there are only winners and losers, and that one needs to be the best over others and win”).

## Results and discussion

The test-retest data show that India participants were reliable in their transitivity scores, somewhat reliable for the democratic global choice, and not reliable for the other global choices. Out of the total number of persons tested, the number who gave global parents’ values on both occasions was  $n = 123$ . Table 3 presents the number of persons who gave choices for the categories and percentage of persons per category who gave the same choice on the second testing. Global choices did not remain stable from first to second testing for the India participants.

The test-retest data show that the Midwest participants in their transitivity scores and their global parental values were far more reliable than were the India participants. The Midwest data show that for those who stated their parents’ values were democratic and those who stated their parents’ values were individualistic, 90% or more restated that view. Chi-square tests showed significant matches for the Midwest global measures but not for the Indian global measures. As a methodological point, use of global measures for assessing reported parental values is clearly of value, but using several measures assures a broader basis for understanding parental values across cultures. The Midwest global measures were reliable but the Indian global measures were far less so. Given that more laissez-faire parenting values were reported by the India participants compared to the Midwest participants, it is congruent that the global reported parental values for the Indian sample were also less reliable than were those provided by the Midwest participants.

**Table 3** Parental Values Global Choice Stability for Indian and Midwest Participants:  $N$  and Percentage of Persons Choosing a Category for First Testing and the Percentage Who Repeated that Choice on Second Testing

First testing	India 2			Midwest 2		
	$n$	%	% repeat	$n$	%	% repeat
Autocratic	23	19%	35%	19	36%	68%
Democratic	84	68%	71%	31	58%	94%
Laissez-faire	16	13%	19%	3	6%	67%
Individualistic	72	59%	49%	21	39%	62%
Collectivistic	26	21%	62%	30	57%	90%
Competitive	25	20%	32%	2	4%	0%

The transitivity data of Study 2 support the transitivity results of Study 1. In Study 2, the higher mean TR score (of more intransitivity) was 1.72 for India 1 and 1.51 for India 2. In contrast, the Midwest 1 mean TR score was .92 and the Midwest 2 mean TR score was 1.11. Within each culture, the mean TR scores between samples were not significantly different, but between cultures they were significantly different. For example, India 1 (mean score of 1.72) compared with Midwest 2 (mean score of 1.11) showed the India participants to be significantly more intransitive,  $F(1, 99) = 4.55, p = .035, \eta^2 = .04$ .

As with Study 1, a two-step sequential regression was conducted. The number of items scored as intransitive was used as the dependent variable. Dummy-coded parental value categories were entered on the first step as the independent variable, and dummy-coded cultural background was included in the second step. As with the analysis from Study 1, the initial model from Step 1 was not significant,  $F(2, 279) = 1.55, p = .22$ , adjusted  $R^2 = .004$ . With the inclusion of the culture variable in Step 2, however, the model became significant,  $F(3, 278) = 4.42, p = .005$ , adjusted  $R^2 = .04$ ,  $R^2$  change = .04. The results of this analysis mirror results from Study 1 as once again the regression coefficient shows that transitivity scores vary with cultural background (standardized  $\beta = -.19, p = .002$ ). Both models were statistically significant but culture was a stronger predictor of transitivity scores than were parental values. Culture alone yielded an  $F(1, 280) = 10.95, p = .001$ , whereas when parental values were added  $F(3, 278) = 4.42, p = .005$ . Again, the Indian sample differed from the Midwestern sample (standardized  $\beta = -.19, p < .002$ ).

Significant differences were found between the Midwest and Indian samples in reported parental values. Clear difference between the cultures occurred on the global measure (see Table 3). The Midwest participants reported more autocratic global parental values and the India participants reported more global democratic and laissez-faire values than did the Midwest participants. Moreover, the Midwest participants reported far higher collectivistic parental global values and the India participants reported far higher individualistic and competitive parental global values.

Strong differences occurred between the two cultures in terms of individualism-collectivism-competitiveness. A  $3 \times 2$  chi-square test on the frequencies of autocratic, democratic, and laissez-faire reported global parental values (shown in Table 3) yielded  $\chi^2(2 df) = 6.82, p = .033$ , and a  $3 \times 2$  chi-square test on the frequencies of individualistic, collectivistic, and competitive reported global parental values yielded  $\chi^2(2 df) = 27.29, p < .001$ . The Indian sample reported more individualistic and competitive and far less collectivistic parental values than the Midwest participants. This pattern sharply contrasts to the literature reviewing studies done before the year 2000, which described Asian cultures (Japan, Korean,

**Table 4<sup>a</sup>** Frequency of Dominant Parental Values for Students of Asian Background in West Coast University 2000–20001 Sample and 2005 India 1 and India 2 Samples

	Autocratic	Democratic	Laissez-faire
Asian (Study 1)	24	72	25
India 1 (Study 2)	0	36	12
India 2 (Study 2)	8	91	29

<sup>a</sup>In Table 4, the number of participants for dominant scores needs to be understood as slightly different than the number for the global scores due to different numbers of valid answers for the two tests.

and China) as more collectivistic than European and North American cultures (Berry et al., 1997; Triandis, 1995).

It is clear that the modern industrialized and urban India participants do not reveal the traditional pattern reported for India and other Asian nations. The technological and industrial revolution in India (Chadha & Husband, 2006; Heenan, 2005) appears to have made major impacts on the Indian culture. Whereas traditionally, the Asian cultures have been identified as collectivistic, the high competitiveness and individualism of reported parental background in the Indian samples of the present investigation, compared to the Midwest samples, is noteworthy.

The West Coast Asians' transitivity scores and reported parenting styles in Study 1 differed sharply from the Indian samples in Study 2. The West Coast Asians reported far more autocratic parenting styles, and they were far more transitive than were the Indian samples in Study 2. The West Coast Asians in Study 1 were largely raised in the United States by parents who grew up in an Asian culture of a previous generation. The West Coast Asian mean transitivity score was .81. This differed significantly from India 1 in the present study,  $F(1, 179) = 15.80, p < .001, \eta^2 = .08$ , and from India 2,  $F(1, 270) = 14.71, p < .001, \eta^2 = .05$ . The Asian West Coast participants of Study 1 reported different parents' values and also were far more transitive than the Indian samples in Study 2. The results provide indirect evidence that parental values relate to transitivity and they also show that culture affects both parental values and transitivity.

The Asian participants in the West Coast study were primarily children of Asian parents who had come to the United States one or more generations ago. Table 4 presents the West Coast Asians of Study 1 compared with the two Indian samples of Study 2 on dominant parental values. In Study 1, no data were collected for individualism, collectivism, or competitiveness, but in terms of autocratic, democratic, and laissez-faire parenting values, the West Coast Asians differ significantly from the Indian Study 2 participants. The India participants reported parental values as far less autocratic and more democratic and laissez-faire than are those of the West Coast Asians. The latter, but not the India participants' reports of Studies 1 and 2, fit what the literature indicated as

the traditional pattern for Asians generally and specifically for Indian families (Dasgupta et al., 1999; Tisdell et al., 2001).

Combining all the results, the data suggest quite strongly that with increasing technological and industrial advances in at least some parts of Asian society, there are strong cultural shifts that are displayed in the reported leadership styles of parents and in the cognitive styles used by the offspring in simple choices of personal value.

## General discussion

It appears that the technological and industrial revolution in India (Chadha & Husband, 2006; Heenan, 2005) has made major impacts on the Indian culture. The present studies have demonstrated that the traditional assumptions about Asian compared to European and American cultures may need to be modified. Fernandes (2000) already reported on changes evident in India. Whereas the more traditional Asian upbringing had a more autocratic parental style than that used by North Americans of European background, contemporary Asian young people growing up in a rapidly changing technological society did not reveal these traditional patterns. The present investigation showed that modern young people in India are more intransitive than both their North American counterparts and the more traditional Asians. Moreover, their parents' values are reported to be significantly less autocratic and more laissez-faire than reported for the more traditional Asian parents' values.

The original hypothesis, linking parental values with transitivity of thinking, is only partly supported. It is supported when one compares West Coast Asians, whose parents' values were more often autocratic compared to other samples of participants, with West Coast Caucasians and with modern India participants. It is not supported overall, in that within the Caucasian samples, the West Coast participants of Study 1 were more intransitive than the Midwest participants but the latter had higher reports of laissez-faire parenting. It is important to note that both studies demonstrated what has not been demonstrated heretofore, that culture affects reported parental values and that culture affects the amount of intransitivity shown when people make simple personal choices.

The traditional conceptualization that Asians are better in science and mathematics than non-Asians suggests that Asians have superiority in transitive thinking. That is likely still to be the case when they deal with intellectual and abstract concepts. However, following the conceptualization of Peng (1998; Peng & Nisbett, 1999) that Asians think dialectically and that they often accept and adopt opposites as equally valid, then the finding of intransitivity of thinking in personal simple choices fits this dialectical pattern. Spencer-Rodgers and Peng (2005, p. 229) explain how the dialectic patterns of change and contradiction could predict greater intransitivity of simple choices:

The three central and interrelated tenets of naive dialecticism consist of the principles of change, contradiction, and holism. . . . The principle of change views reality as a dynamic process and holds that the world is in constant flux. Because reality is fluid and ever changing, all objects and events in the universe are thought to eventually change into their opposites (e.g., what is positive becomes negative, what is negative becomes positive). The related principle of contradiction asserts that all phenomena are composed of at least two opposing elements (yin/yang) that exist in active harmony and balance.

To the dialectical mind, the principle of change would be likely to lead to intransitivity, and the principle of contradiction would be likely to make acceptable the principle that one is intransitive in simple personal matters even though in abstract and objective matters, one adopts strictly mathematical and transitive thinking.

A number of methodological considerations are also raised by this study and are worth mentioning here for purposes of informing replication attempts. With regard to the differing transitivity measures, it was found that the most important consideration is that the participants are familiar with the content of what they are comparing. Because Indian students were not familiar with one of the locations on the task, the decision was made to change Hawaii to Paris for the India participants in Study 2 on the transitivity task. This permitted a better comparison with the Midwest participants, all of whom were familiar with the locations (Hawaii and London). The resulting variances of the two measures were homogeneous.

On a similar note, parental value measures were altered in order to increase construct validity. The original 15-item measure was found to have a slightly different factor structure than originally hypothesized for students in the United States (see Ferguson et al., 2006). The 40-item measure was constructed in order to better capture the parenting styles across cultures in the 21st century. When compared to the single-item global measure, the 40-item inventory of parental values showed greater test-retest reliability for the participants in India. It seems that the single-item global measure can be used for research in places where there are not large proportions of laissez-faire parenting styles, but for cross-cultural comparisons, it is better to utilize the 40-item inventory.

In summary, we have found significant cultural differences in reported parenting styles and in transitivity of simple personal choices. These are noteworthy and provide new findings, not reported heretofore. Moreover, we have shown that young adults in the modern urban and upward-mobile India reveal patterns not reported in the earlier literature. For industrially developing nations, a competitive, individualistic, and laissez-faire set of values appears to be guiding the upcoming generation, in sharp contrast with what are considered traditional values for Asians compared to Caucasians. The implications are far reaching, in that these cultural changes are likely to alter all spheres of social life. Further studies with other Asian groups in developing economies are currently underway by some of the present authors. More research is clearly warranted in this area of investigation.

## Author notes

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