The Use of the Kirton Adaption-innovation Inventory in Thailand: An Exploratory Study

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Abstract

The generalisability of Western personality research to non-Western cultures is challenged when concepts and constructs rooted in one culture (the UK) are transported to another (Thai), particularly where there is purportedly a marked difference in the concept of self. The Kirton Adaption-innovation (KAI) inventory (Kirton 2006) when viewed from a Western perspective comprises items that are related to both the Innovative and Adaptive poles; the items associated with the latter pole are reverse-scored within the measure to align with the Innovative items (r= 0.41, p< 0.001 n=562) so as to provide an Innovatively oriented scale of 32 items (Mean=95 Alpha=0.88). In the Thai sample, while there were no significant differences in the item scores the Innovative items were negatively related to the reversed-scored Adaptive items (r= -0.37 p< 0.001 n=202), in effect bringing together the two opposite poles of the bipolar concept into a single holistic group (e.g. Nisbett & Peng 1999; Spencer Rogers & Peng 2005*). While the factor configuration for the Thai sample was fragmented a number of the more significant items were selected to represent the original three factors of the Kai scale. This scale of 15 items was factored and the three original factors were easily identified. However, the Innovative items (the factor SO) retained their negative relationship with other items in the scale.*

Key Words*: Cognitive Style, Cultural Differences East -West, Holism, Bipolar Scales,*

Research Question

Does Thai culture produce expectations that require Thai nationals to be proficient in English in order to assess the UK-constructed scale items of the Kirton Adaption-innovation (KAI) measure in ways that do not support the Western view of the cognitive style concept (Kirton 1976, 1999, 2006)?

Introduction

Psychological concepts cover a broad collection of behaviours arranged into groups that are assumed to broadly apply to all individuals irrespective of culture, country or language (McCrae 2001). These are so-called Universal concepts. However many psychological concepts have associated measures that cannot be satisfactorily transported from one culture to another. Where the concept is operationalised through culturally-general (etic) constructs then the transportation is reduced to the translation of both the completion instructions (rarely considered as part of the problem) and the individual scale items, resulting in a measure that can be used efficiently in the target culture.

While concepts are culture-general, but, either through choice or necessity the measurement focus or some of the individual scale items within a measure are culture-specific (emic), then those variables that distinguish one country from another, usually referred to as national culture (see Hofstede 1980; and Schwartz 1999) are implicated in any transportation. The problem then becomes one that is beyond that of mere translation.

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While cognitive style is conceptually rooted in the different contributions from experimental situations exploring cues in visual perception (*a la Witkin*) to value surveys (*a la Rokeach*), there are a number of different measurement *domain foci* that have been used to create operational measures. These range from psychometric devices, for example, Problem solving styles (Kirton 1976, 2006), or Learning styles [(Kolb 1976; Honey & Mumford 1986)], to objective experimental procedures, for instance, Luchin's jars, Rod & Frame (Witkin & Goodenough 1977). The latter objective procedures do not rely on behavioural items and are thus potentially less prone to interpretation errors and therefore less culturally sensitive

It has been widely accepted that Social Culture can be treated as a set of cognitions shared by individuals in a social unit (Hofstede 1980; Schwartz 1999; Geertz 1975; Wallace 1970). These cognitions in well defined constellations, differing in both content and hierarchal priority, differentiate groups and societies and, according to Cooke and Rousseau (1988), "act as reinforcers that strengthen the connection between features in the environment and an individual's response." Thus people in different societies, in achieving their goals, will have significantly different constructions of the expected behaviour of self and of others. The development of the different selves (Triandis 1989) is influenced by successive construing of events to provide for a better situational interpretation concerning events and objects that relate to: experiences, processes, values, personality traits and preferences. The resultant profile of the constructs involved increases the chance that in a particular context different cognitions will be sampled more frequently than others or, as Kelly (1963) suggested, individual thinking is channelised by the contextually construed structure.

When considering the differences between Western and other cultures, Knutson (2003) observed that: "*When compared to other populations, the differences between Asian and Western cultures are maximal; that is, the communality among variables is small and a great number of components differ conspicuously*" (p. 2).

Thus, if there are differences to be found across cultures, then samples that compare across the Western/Asian divide afford the best way of exploring them. When comparing East/West, many Asian cultures have a distinctly different conception of the self where a fundamental social relatedness of individuals to each other is required. In such cultures, the emphasis is on attending to others, fitting in, and harmonious interdependence. While in Western (e.g. Anglo/American) cultures such connectedness among individuals may only be considered of situational value. Furthermore, in Western cultures individuals seek independence from others by attending to the self and developing and expressing their personal attributes

Knutson (2003), when considering the use in Thailand of the RHETSEN2 measure of rhetorical sensitivity imported from the USA, found several of the items incompatible with the Thai cultural values and so questioned the instrument's assessment of rhetorical sensitivity in a Thai setting. The emphasis on social harmony in Thailand, for example, contrasts sharply with the American cultural values of individual achievement and success. In addressing this problem, Ho (1998) advocated the development of "…conceptual frameworks and methodologies rooted in the target culture under investigation rather than relying on imported ones" (p. 88).

Also Hofstede (2005) commenting on his own work observed that: "…*Both the IBM questionnaire and the RVS were products of western minds. In both cases respondents in non-western countries had answered Western questions […] To what extent had irrelevant questions been asked [and answered] and relevant question been omitted*?" (p. 29-30*).*

This echoed an earlier conclusion that *"[Culture] not only affects our daily practices, it*

*also affects the theories we are able to develop to explain our practices. Culture's grip on us is complet*e." (Hofstede & Bond 1988, p. 19)

Knutson et al. (2007), in a study to compile a Thai version of the RETSEN2 measure (a 30 item inventory of rhetorical sensitivity), added a further 60 items generated by Thai nationals using a translation of the concept description. The resulting 90 items were analysed for item total correlation and factor consolidation. From the 30 items that were retained to form the new scale three factors were extracted that were consistent with the factors of the original measure. However, only two items of the original scale displayed high enough factor loadings to be included in the new instrument. While any psychological instrument will contain items that vary in their cultural sensitivity, in the case of RETSEN2 only some 5% (2 items) were meaningful in both target and originating cultures, emphasising the need for both language and cultural transformations for most items in the scale.

Thus it would appear that all individuals have value systems conditioned by the cultural norms of their social environment and are unable to shake off these influences when deciding what action to take as a consequence of a particular circumstance. Because of this, successful transporting of a measure from one culture to another requires that the concept, the operational focus, the conceptual anchor for completing the measure as well as the behavioural items used, are all supported and understood in the target culture in much the same way as the original measure when used in the originating culture.

1. Research Design and Hypotheses Development

When considering the way national cultures may be implicated in individual behaviour, a number of significant studies (e.g. Hofstede 1980; McCrea 2001; Schwartz 1999) link conformity and interdependence as significant variables in East/West cultural differences. These dimensions are also significant in Kirton's (2006) concept and measure of cognitive style**.**

In a major study by Hofstede (1980), culture is described in terms of five pervasive dimensions, where the contrast of 'East/West' is near its maximum when the cultures of the UK and Thailand are considered (Table 1).

Table 1 - Summary of Scores for Hofstede's Culture Dimensions

	UK	Thailand	Difference
(i) Power Distance Index	30	64	+34
(ii) Individualism/Collectivism	85	20	-65
(iii) Masculinity	60	34	-26
(iv) Uncertainty Avoidance Index	30	64	+34
(v) Long Term Orientation	20	50	+50

All scores are based on a % scale of 0 to 100

(*i) Power Distance Index (PDI***)**: - This is the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed - and exercised - unequally. In Thailand, the need to conform as an aid to maintaining good relations and avoiding conflict with the more powerful members of the particular group is important for institutional progress - or even for group membership longevity.

(ii) Individualism (IDV) versus collectivism (its opposite): - Here, differences between Eastern and Western cultures are at their maximum, where the Thai culture is concerned with collectivism while the West is concerned with individualism. On the individualist side, we find societies where there is a greater diversity of differences within groups than between groups; the ties between individuals being loose and everyone expected to look after themselves and their immediate family On the collectivist side, we find societies (such as Thailand) in which people from birth onwards are integrated into strong, cohesive in-groups, with associated interdependent relationships that, coupled with a high PDI, leads to behaviours that are conforming and follow hierarchal family traditions. The significant lack of independence shows little support for behaviours that show a break with social traditions and the all important

need to maintain group relationships and avoid conflict.

*(iii) Masculinity (MAS***)** versus femininity (its opposite): - It refers to the distribution of roles between genders, a fundamental issue for any society within which a range of solutions to problems are required. Women's values differ less among societies than men's values, which are more diverse from one country to another, varying from very assertive and competitive, to modest and caring, similar to women's values.

(iv) Uncertainty Avoidance Index (UAI): - It deals with a society's tolerance for uncertainty and ambiguity and ultimately refers to man's search for Truth. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in conflicting or unstructured situations.

(v) *Long-Term Orientation (LTO)* versus short-term orientation: - This is the cultural trait that is concerned with the extent the group invests for the future and is persevering and patient in achieving results.

In a more detailed evaluation of the differences between Western and Eastern cultures from a social psychological perspective, Markus and Kitayama (1991) used differences extracted from Hofstede (1980), Schwartz & Bilsky (1990), and Triandis & Brislin (1980), respectively. These differences concern important emergent aspects that exist in process, content, structure, and the functioning of people with different cultural backgrounds. They conceptualised the cultural differences as Independent and Interdependent, respectively. Using these definitions, they described the degree to which the self is seen as separate from or connected with others. An independent self-construal is related to a belief in the uniqueness and separateness of individual persons, which they described in more details as follows:

"The primary components of the independent self-construal are one's unique traits, abilities, preferences, interests, goals, and experiences, and these are differentiated from social contexts, interpersonal relationships, and group memberships. To maintain and enhance this independent view of the self one must maintain a sense of autonomy from others and "be true to one's own internal structures of preferences, rights, convictions, and goals." (Markus& Kitayama 1994, p. 459)

An interdependent self-construal is also related to a belief in the individual as connected with others and with the social context.

"The underlying principle that shapes the interdependent self-construal is the premise that the person is connected to others, so that the self is defined, at least in part, by important roles, group memberships, or relationships. For individuals with this self-construal, representations of important relationships and roles share the self-space with abstract traits, abilities, and preferences (of self). To maintain and enhance this interdependent view of the self individuals will tend to think and behave in ways that emphasize their connectedness to others and that strengthen existing relationships." (*Ibid*, p. 570)

In reviewing these cultural differences, Markus and Kitayama (1991) described a number of national characteristics that have been identified as relating to the interdependent self. For example, Triandis, et al. (1984) described the importance of 'Simpatico' among Hispanics. This quality refers to the ability to both respect and share others' feelings. Such description shares close parallels with the popularity of the so-called 'emotional intelligence' concept in Western management development settings, perhaps, like quality circles in the 1980's, a Western importation of Eastern values. In characterising the psychology of Filipinos, Church (1987) described the importance that people attribute to smooth interpersonal relations and to being agreeable even under difficult circumstances.

Also of concern in the literature are the effects of differences in culture on measure construction. Of particular interest is the reoccurring issue of the way items with negative or positive face validity within a single measure

are responded to. For example, research by Bagozzi et al. (1999), found that whereas Americans appear to experience positive and negative emotions in an oppositional, bi-polar manner, East Asians seem to experience positive and negative emotions in a more dialectical, holistic manner. In explaining these results, they suggested that Americans tend to polarize contradictions while East Asians seem to accept contradictions as part of the natural order.

These findings were extended by Williams and Aaker (2002), who suggested that East Asians are more accepting of conflicting emotions than Americans. Thus, when faced with the apparent contradictions embodied in a mixed-worded scale, Americans may have a predisposition to view positive and reverse-worded items as polar opposites while East Asians have a predisposition to view these items as related parts of a larger order. Although these findings are related to East Asia, previous research suggests that problems with Likert scales containing items which are not positively related to the concept being measured may not be limited to this region. For example, Marin, Gamba, and Marin (1992) determined that respondents from Latin American cultures display a high level of acquiescence and often agree with both positive and reverse-worded items. Likewise, Steenkamp and Burgess (2002) find non-white South Africans respond differently to reverse-worded items than to positive-worded ones (see also Meloni & Gana 2001).

Recent studies (e.g. Nisbett & Peng 1999; Spencer et al. 2005) have attempted to consolidate these findings through a framework of Eastern dialecticism linked to Confucian philosophy and emphasising within the environment contradiction, change and interrelations as parts of the overarching concept of Holism. In contrast Western cultures viewed through a similar framework are based on Aristotelian philosophy where formal logic, structural consistency, immutable laws and truths and de-contextualised facts and ideas provide different environmental pressures (Spencer et al. 2005).

The associated knowledge and salient values of different cultures lead to different ways of thinking about the various situations and environmental expectations faced by individuals (e.g. Denison 1996; Cooke & Rousseau 1988) and to what may be considered an appropriate behavioural response.

2. Implications for the use of the KAI measure in Thailand

With regard to the Thai culture there are three issues that potentially will be of concern when using the KAI inventory in Thailand:

- The first is that literature offers some support to the notion that psychological concepts (as objective principals) may be regarded as universal and independent of culture whereas measures and their supporting constructs can be seen as culturally dependant (of varying degrees) and should be restricted to a specific population (Markus 2008).
- The second concerns culture and the way it reflects expectations for the maintenance of interpersonal relationships by others of the same social community. Lebra (1976) proposed that in an Eastern culture individual abilities and characteristics are potentially assigned only secondary roles and must be constantly monitored to ensure alignment with the primary tasks of interdependence. Thus, cultural expectations for social conformity tend to submerge personal preferences and personal goals in such a way that they are not easily evaluated by the individual. Furthermore, individuality, in support of independence is associated with the ‘creative loner’, and is a significant component of the Kirton’s (1976, 2006) description of the Innovator. However, individuality and independence is offered little support in the Thai culture and Innovative behaviour and its attendant disruptive nature tends to be avoided. In a social culture, where the expectations of others potentially overwhelm any innovative preference, individuals become

less inclined to challenge social norms, and their creativity is more align with prevailing conventions (Goncalo & Staw 2006).

- The third issue, which interacts with the second, involves conflict avoidance and concerns the way the different items that form the measure of the concept may be responded to. Here, particularly in Thai culture, the pressure to maintain relationships potentially supports a desire to avoid conflict, which in turn implies that when items that may engender conflict are evaluated, a neutral or 'middle way' is chosen (Nisbett 2004).

3. Hypotheses

This study sets out to determine if there is a bias in the way Thai Nationals, fluent in spoken English respond to the KAI inventory. Such biases can come from cultural assumptions and value dispositions that influence individual belief systems or styles and leads to a cultural bias in the ways events are seen and problems resolved (Sparrow & Wu 1998). This cultural contrast is near its maximum when the cultures of the UK (the originating culture of the KAI) and Thailand (the target culture for measurement) are considered (see Table 1).

H1 *Since the Kirton (1976, 2006) measure of cognitive style consists of items that have both positive and negative face validity (with the concept of Innovation), the relationship between these two groups of items will not reflect the polar differences.*

H2. *Because of social interdependence, where individual abilities and characteristics are potentially assigned only secondary roles, personal preferences will not have a primary individual visibility. This will reflect in a disturbed factor structure when interpreting the concept of cognitive style, as defined by Kirton (1976, 2006), within the Thai culture*

4. Methodology

- Procedure

The administration of the Kai inventory followed the procedure outlined in the manual, except where detailed in the Sub-sample introductions below. The comparative statistics for each of the Sub-samples and all the samples are shown in Appendix 1.

- Sample Characteristics

The Thai nationals involved in this study were all fluent in English so as to minimise any bias from a lack of understanding. All had some overseas exposure but only for short periods. No other critical issues were detected that would influence cultural values.

The quantitative results from each of the six samples (Appendix 1) were examined to determine if there was any evidence to prevent aggregation into a single sample. Two aspects were considered in detail. The first is the item means for the Innovative ($F=0.96$ $p=0.44$) and Adaptive ($F=1.99$ $p=0.31$) items. No significant differences were found between the six samples. The second aspect concerns the correlation between the groups of items representing the Innovative and Adaptive poles for each of the samples. Here, the null hypothesis was tested and no evidence was found against the proposition ($\mathbf{X^2}=7.97$ $p=0.16$). Thus the six samples were aggregated into a single group ($n=202$) with statistics as shown in Appendix 1.

- Measure

Concept Definition: The theory of cognitive style as advanced by Kirton (1976, 2006) as part of the problem solving process concerns a bipolar concept that involves at one end of the inter-polar continuum paradigm-consistent ideas that are transactional, concerned mainly with improvement, less disruptive and therefore more readily accepted. At the other end are paradigm-breaking ideas that are transformational, concerned with significant changes in concept, more disruptive, and less readily accepted (Kuhn 1970; Drucker 1969b). Kirton labelled these two poles as Adaptor (paradigm-consistent) and Innovator (paradigm- breaking). Individuals at

the Adaptor end of the continuum have a preference for “doing things better” while those individuals at the Innovator end a preference for “doing things differently” (Drucker 1969a; Kirton 1976)

- *Measure Design*

The Adaption-Innovation concept is evaluated by the KAI inventory, which measures individual preference for behaviours that relate to the two different polar definitions of Innovative and Adaptive activity. The items used in the English version of the inventory are concerned very much with Western traditions and values, where the first of the 33 items is a dummy and is not included in the overall scale. The measurement scale consists of 32 items, 11 of which relate to behaviours associated with the Innovative pole. A further 21 items relate to behaviours associated with the Adaptive pole, giving an overall scale of 32 items that mirrors the bipolar concept. To allow summation of all items from an innovative orientation, the items representing the Adaptive pole are reverse scored. From the summed items score, a numerical value for cognitive style is derived and increases with an increasingly Innovative behavioural preference of the individual. The inventory items are scored on a 17-point scoring scale that ranges between Very Easy and Very Hard. These seventeen points are reduced to a five-unit Likert scale. This provides a scale where there is a moderate positive item-total correlation that avoids duplication but is sufficient for a high coefficient Alpha.

- *Measure Characteristics from a Western Perspective*

The 32-item inventory has Cronbach Alpha coefficients for internal reliability variously estimated between 0.85 through to 0.90 (Kirton 1987). Theoretically, the measure allows a range of scores from 32 (extreme Adaptor) to 160 (extreme Innovator) with a mean of 96.0. The actual distribution, based on many large general population samples totalling n>1000 UK subjects (*Ibid*), yields a normal distribution of scores ranging from 46 to 146, with a mean of 95.0 and a SD of 17.9 (*Ibid*). Consistent with the "familiar bell-shaped curve" (Katz & Kahn 1978) and typical of human preferences, the stability of this underlying cognitive preference is supported by test-retest correlation coefficients estimated between .82 and .86 (Kirton 1987).

The underlying psychological mechanisms of the measure have been examined using varimax rotated factor analysis where three factors have been extracted consistently. They have been labelled: (i) Sufficiency of Originality (SO); (ii) Efficiency of operation (E); and (iii) Rule/group conformity (R) (Kirton 1976) (See Kirton 2006, p. 58-60 for a more complete description).

(i*) Sufficiency of Originality or SO (13 items):* Here, the Individual preference aligns with the innovative pole of the measure and relates to the ‘Creative Loner’ (Rogers 1959), describing people who have a preference to, among other, compulsively toy with ideas. Kirton (1999) added to the description by suggesting that a person with less regard for the prevailing cognitive structure prefers to proliferate ideas where some are truly paradigm-cracking.

(ii) *Efficiency or E (7 items):* Here the individual preference is for ‘Adaptive efficiency,’ which is concerned with improvements to the current external structure and process methods. This is in keeping with the Adaptive pole of the measure and relates to Weber’s (1970) analysis of the aims of bureaucratic structures

(iii) *Rule/Group Conformity or R (12 items):* Here, the individual preference again relates to the Adaptive pole of the measure and concerns the way in which conformity to external pressures from both rules and inter-personal relationships are managed. While these aspects are closely related, Merton’s (1957) analysis of bureaucratic structure suggests that such pressures with regard to prudence, method and discipline lean towards structural rules rather than interpersonal relationships.

The items in the E and R factors are all related to behaviours associated with the Adaptive pole as are two items from the SO factor. The remaining SO items are all concerned with behaviours associated with the Innovative pole.

The consistency with the replicated factor analyses supports these factors as being related to by stable personality traits (Kirton 1976, 1987; Goldsmith 1985; Prato et al. 1984), offering some explanation for the long-term stability of cognitive style preferences. This link between cognitive style and personality is well attested, locating these factor descriptions within the total personality domain (Carne & Kirton 1982; Kirton & de Ciantis, 1986) and correlating them with specific personality traits (e.g. Kirton 1976, 1987; Gryskiewicz 1982; Goldsmith 1984).

The scale characteristics and the structure of the three underlying factors have been shown to have long-term stability when used in Western cultures (Clapp 1993) whereas the KAI Inventory has been established as being unrelated to Social Desirability (Kirton 1976; Goldsmith et al. 1986), thereby reducing the possibility of any significant bias in assessing others' behaviour (Clapp & de Ciantis 1989). However, as Social Desirability is seen to be associated with social culture (Dunn et al. 2009), such findings may not extend to both social cultures, East and West

5. Results

The quantitative results using the sample (n=202) are grouped into the following short sections, each providing a summary of a particular aspect of the measure performance as defined by Kirton (1999) in the KAI manual.

- Item Distribution

For the items to be capable of summation as summary description of the concept, each item needs to approximate to a normal distribution. Maxwell (1971) has suggested an 80/20 rule, where, for a five-unit Likert scoring key, the highest and lowest two units should be greater than 20% and less than 80% of the total score (the former being the more stringent). As Table 2 shows (see Appendix 2), the score distribution for the 32 items in the scale where response skew is small indicates that the respondents were unlikely to have been confused by any translation issues. Only two items (20 and 29) fail to meet the criteria set by Maxwell (ibid).

- Scale Statistics

Table 3 - Scale Statistics

Variable	**Standard Sample**	**Total Thai Sample**
Sample Size (n)	562	202
Kai (group mean)	95.00	92.0
Kai Std Dev	17.90	8.81
Kai Range	45-145	65-124
Item-total r (mean)	+0.19	+0.04
Item-total r (min)	-0.11	-0.39
Item-total r (max)	+0.57	+0.48
Scale Alpha	+0.88	+0.54
Factor SO	40.78	40.76
Factor E	18.82	18.93
Factor R	35.39	32.31
Theoretical SO	40.85	39.65
Theoretical E	19.00	18.40
Theoretical R	35.15	34.04
SO items (mean) (Positive scored)	3.14 Alpha 0.83	3.14 Alpha 0.51
E items (mean) (Negative scored)	2.69 Alpha 0.77	2.70 Alpha 0.65
R items (mean) (Negative scored)	2.95 Alpha 0.83	2.69 Alpha0.68
E and R items (mean) (Negative scored)	2.85 Alpha 0.86	2.70 Alpha 0.78
Correlation SO with E	+0.22***	-0.38***
Correlation SO with R	+0.45***	-0.30***
Correlation E with R	+0.49***	+0.61***
Correlation SO with E and R	+0.41***	-0.37***

Note the items from factors E and R are negatively scored to achieve innovative alignment with items from factor SO

Table 3, Column 2, shows the base information about the KAI Standardisation sample (n=562). This Western sample provides most of the published characteristics of the measure of the A-I concept (Kirton 1999).

There is little difference between the means (3.21) of the Innovative items (factor SO) and the means (2.85) of the Adaptive items (factors E and R) other than the means of the two groups of items being spaced above and below the theoretical mean (3.0). The correlation between the Innovative items (factor SO) and the Adaptive items (factors E and R) is positive and significant ($r = +0.37$, $p<0.001$). The overall scale Alpha is 0.88 while the Alpha for the factor SO is 0.82 and 0.87 for the factors E and R.

Table 3, Column 3, shows the overall statistics for the Thai sample (n=202). The item means of the factor SO items (3.14) and that of the factors E and R items (2.70) show a similar pattern to the values found in the Standard sample. However, the correlation between the items of the factor SO and those of the factors E and R is negative ($r = -0.37$ $p<0.001$). The overall scale Alpha is 0.54 whereas with regard to the factor SO, Alpha is 0.51 and 0.78 with regard to the factors E and R; all significantly different from the standard sample. The similarity of the means and the lower alpha offers little support for the involvement of Acquiescence or Social Desirability bias in the scoring of the items.

Each of the six sub-samples from Thailand (see Appendix 1) follows a similar pattern, where there are significant negative correlations between the groups of items that comprise the KAI factors SO, with factors E and R; the items in the latter two factors being reverse-scored to align with the innovative pole of the concept. This change of sign of the correlation coefficient offers evidence that the SO items with their Innovative orientation are being interpreted within a frame that has Adaptive behaviour as its focus hence the negative relationship with the reverse-scored factors E and R (If we forgo the reversal of the E and R scores, these two factors will align with the Adaptive pole and factor SO will be positively correlated). This change in the sign of the correlation between SO and E+R illustrates the proposal by Bagozzi et al. (1999) and Nisbett (2004) that all the items in a scale tend to be viewed as a holistic group with, in this case, an adaptive orientation. While, in other studies, it is the negative items that have been scored in the same phase as the positive, in the case of this sample from Thailand, it is the positive items that have changed phase. Such a change in phase also disturbs the item-total correlations where items that have a negative correlation reduce the Alpha scale (See Tables 3 and 4). These finding all support Hypothesis 1 assertions.

- *Scale Reliability*

Table 4 below shows the Item-Total statistics for all of the items as an additive measure. Fourteen items show a negative relationship with the remainder of the scale, eleven of which are from factor SO items, two from factor R, and one from E. In addition, some other items, while not negatively related, have a low correlation with the remainder of the scale. The two SO items (13 and 24), which have a face validity that aligns with the adaptive pole, are not negatively related and also provide satisfactory item-total correlations. The lack of consistent positive item-total correlations results in an overall scale that is lacking in reliability (Alpha = 0.54).

In an attempt to improve the scale statistics, the fourteen items in Table 4 (marked with an *) were examined further. First, the eleven SO items need to be reverse-scored to bring them into the same phase as the reverse-scored Adaptive items which have been transformed to align with the Innovative pole.

In Table 5 (Appendix 2), in which the nine of the eleven SO items that describe innovative behaviours have been reverse-scored, it can be seen that all of these items align with the reverse-scored E and R items. Of the three further items, two from R (10 and 27) and one from E (28), the item-total correlations have

improved sufficiently for them to be retained without further adjustment.

Table 4 - Item-Total Statistics for the 32-item Scale Using the Thai Sample (n=202)

Item Number	Factor Label	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
kai2	R	89.2921	72.984	.217	.216	.525
kai3*	SO	88.6040	79.385	-.150*	.309	.567
kai4	E	89.3069	71.308	.259	.280	.518
kai5*	SO	88.9158	76.814	-.013*	.345	.552
kai6	R	89.2970	72.797	.227	.450	.524
kai7	R	89.1436	71.905	.223	.288	.523
kai8	R	89.1436	69.467	.380	.332	.503
kai9	R	89.3168	70.735	.317	.313	.511
kai10*	R	89.1782	75.063	.075*	.367	.542
kai11*	SO	88.6089	78.916	-.125*	.275	.563
kai12*	SO	88.6931	79.786	-.171*	.196	.570
kai13	SO	89.4950	72.042	.263	.323	.519
kai14	E	89.1337	72.335	.231	.310	.523
kai15	E	89.2822	71.019	.287	.391	.515
kai16*	SO	88.6436	77.773	-.062*	.448	.557
kai17	E	89.4703	70.211	.368	.377	.506
kai18*	SO	89.1436	74.661	.080*	.291	.542
kai19*	SO	88.6931	78.154	-.084*	.296	.560
kai20	R	89.7079	70.546	.321	.369	.511
kai21*	SO	88.6931	80.890	-.222*	.354	.578
kai22	E	89.2475	71.570	.299	.380	.515
kai23*	SO	88.6535	80.755	-.225*	.427	.574
kai24	SO	89.3416	69.838	.351	.379	.506
kai25	E	89.3861	71.343	.293	.304	.515
kai26*	SO	88.8366	78.316	-.094*	.253	.562
kai27*	R	89.1386	75.304	.079*	.239	.541
kai28*	E	89.2129	73.542	.153*	.225	.532
kai29	R	89.4802	69.515	.428	.466	.500
kai30	R	89.4356	70.466	.345	.443	.509
kai31*	SO	88.8564	77.935	-.073*	.236	.559
kai32	R	89.2079	71.290	.228	.289	.521
kai33	R	89.2871	70.833	.306	.363	.513

SO = Sufficiency of Originality E = Efficiency R = Rule/Group Conformity

- marks items with low or negative Item/Total correlations

Three items did not meet the item-total correlation requirements, (where r >+0.2) and were deleted from the scale. These were item 2 (factor R r=0.07), item 18 (factor SO r=0.01) and item 31 (factor SO r=-0.09). The two SO items (13 and 24), that have Adaptive face validity and are normally reverse-scored, continued to perform satisfactorily.

The general statistics of the resulting 29-item scale can be seen in Table 5a below. Te theoretical mean is 87 points, while the actual mean is 78.1 with a standard deviation of 13.3. A much improved item-total correlation (mean r=0.154) results in an Alpha of 0.84.

Table 5a - Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha
78.0743	175.900	13.26	0.84
Inter-Item Correlations			N of Items
Mean	Minimum	Maximum	
.154	-.179	.483	29

Thus the items of factors E and R form reliable scales of Conformity (both group and rule) along with Efficiency. However, due to their Adaptive face validity they are reverse-scored to align with the Innovative pole. The items in factor SO with their Innovative face validity are normally consistent with the reverse-scored E and R items. However, in the Thai sample, they have been assessed as though they were adaptively oriented and holistically part of the same group as the E and R items. This holistic grouping of all of the items of the scale could account for the negative correlation between the items of factor SO and those of factors E and R.

- *Factor Identity*

To determine if the two poles of the concept and the associated three factors are still evident, confirmatory factor analysis was employed (Nunnally 1978). Table 6a shows for the standardisation sample a two-factor solution (such a solution was proposed by Keller and

Holland (1978) to be the most stable structure for cross–cultural work). The first factor contains the KAI factors E and R the, second factor, the KAI factor SO. Other than one misplaced item (13), the two poles of Adaptively-oriented items (factors E and R) and Innovatively-oriented items (factor SO) are clearly illuminated.

Table 6a - Rotated Two-factor Solution for the Standardisation Sample Using the Standard 33-item Kai Scale

Item Number	Factor Label	Factors	
		1	2
kai25	E	.636	
kai17	E	.609	
kai33	R	.596	
kai30	R	.589	
kai14	E	.585	
kai8	R	.547	
kai27	R	.546	
kai7	R	.544	
kai2	R	.539	
kai15	E	.537	
kai22	E	.519	
kai9	R	.509	
kai4	E	.471	
kai32	R	.468	
kai13	SO	.463	
kai29	R	.449	.338
kai20	R	.430	
kai6	R	.430	
kai28	E	.421	
kai10	R	.369	
kai21	SO		.734
kai16	SO		.679
kai23	SO		.638
kai11	SO		.634
kai26	SO		.577
kai19	SO		.574
kai18	SO		.570
kai3	SO		.556
kai5	SO		.514
kai24	SO	.311	.448
kai12	SO		.411
kai31	SO		.349

SO = Sufficiency of Originality E =Efficiency
R= Rule/Group Conformity

'Factor Labels' are from the three factor solution of the standardisation sample

Table 6b shows the same two factor solution using the Thai sample with the 29 item scale and item polarities shown in Table 5 (Appendix 2).

Table 6b - Rotated Two-factor Solution for the Thai Sample Using the 29-item Scale

Item Number	Factor Label	Factor	
		1	2
Kai8	R	.627	-.295
Kai30	R	.594	
Kai15	E	.578	
Kai24	SO	.566	
Kai7	R	.561	
Kai29	R	.528	.317
Kai17	E	.462	.295
Kai6	R	.454	.415
Kai22	E	.453	.365
Kai20	R	.441	.244
Kai9	R	.379	.253
Kai25	E	.355	.338
Kai13	SO	.344	
Kai32	R	.328	
Kai19r	SO	.314	
Kai33	R	.311	
Kai5r	SO		.585
Kai10	R		.577
Kai3r	SO		.558
Kai11r	SO		.529
Kai23r	SO	.294	.523
Kai21r	SO	.277	.439
Kai27	R		.421
Kai16r	SO	.250	.418
Kai14	E	.246	.399
Kai4	E	.260	.363
Kai28	E		.281
Kai12r	SO		.246
Kai26r	SO		.235

'Factor Labels' are from the three factor solution of the standardisation sample
SO = Sufficiency of Originality E =Efficiency R= Rule/Group Conformity

Consolidation of the Kai factors is much less clear. The first of the two factors essentially

consists of the items from the Kai factor R while the second factor consists essentially of items from the Kai factor SO. However, the factor E items are scattered between R and SO. Noticeably, the standardisation sample has only two items with significant cross-loadings (SO item 24 and R item 29). In the meantime, the Thai sample has 13 items with significant cross-loadings (SO, three items, E, five items and R, five items). Even allowing for a degree of error and unique variance, the two-factor solution provides evidence that for the Thai sample, the SO items are viewed differently to most R items while the items from Kai factor E disturb the balance between the factors of the two-factor solution.

A three-factor solution for the Thai sample was then considered to see if the three KAI factors (SO, E and R) could be established. Table 7 (Appendix 2) shows the results, where, as with the two-factor solution, the first factor is dominated by KAI factors E and R items and the second one by KAI SO items. The third factor has six items from all three KAI factors. Furthermore, the three factors extracted contain items from all the KAI factors (SO E and R. Such a grouping cannot be interpreted within the structure defined by the standardisation sample of the Kai measure defined by Kirton (1999), where many (Western) studies have shown item-factor stability of greater that 85% in which only three of four items are displaced. Thus even with 29 items and an Alpha of 0.84 extracted factor patterns do not correspond to those from Western samples

To determine if a more interpretable structure existed, only items that have a simple structure and a significant loading on one of the three Kai factors were considered. This selection process attempted to minimize error and unique variance by using a smaller number of items (that are potentially more etic) to produce the overall scale (Bagozzi et al. 1995). An analysis of this smaller scale showed an Alpha of 0.75 and factors that are more simply described where E has the highest internal reliability and accounts for most of the variance (24.6%). R is next with 10% and SO accounts for the smallest amount of variance (8%). While the SO items are still retaining their negative relationship, they are clearly recognised as a distinct factor. The total scale variance accounted for by all three factors is 43%. However, unlike Western samples, the KAI factor SO takes a subservient role in accounting for scale variance.

Table 8 shows the factor structure with the KAI factors clearly defined. Hypothesis two is thus only partially supported.

Table 8 - Rotated Three-factor Solution for the Thai Sample Using 15-factor Markers

Item Number	Factor Label	Component		
		1	2	3
kai17	E	.731		
kai22	E	.664		
kai25	E	.591		
kai14	E	.561		
kai4	E	.421		
kai30	R		.802	
kai29	R		.683	
kai33	R		.528	
kai8	R		.516	
kai9	R		.489	
kai5r	SO			.696
kai11r	SO			.618
kai16r	SO			.591
kai3r	SO	.316		.576
kai12r	SO			.305

Note that:
- R items are mainly concerned with rule not group conformity
- E items are mainly concerned with efficiency through mastery of detail
- SO items are mainly concerned with original thinking rather than risk taking in decisions or interpersonal behaviour. However, these items are reverse-scored hence the positive loading on factor 3

6. Discussion

When the KAI is used in a Western context an increasing score shows an increasing Innovative preference. Such a score is achieved by reverse-scoring the items with an Adaptive face validity (these are items associated with the KAI factors of E, R and two items from SO) so that they align with the items of Innovative face validity

that comprise most of the KAI factor SO. Thus the KAI inventory comprises some items which have Innovative face validity and some Adaptive face validity. This mirrors the configuration described by the concept of cognitive style (Kirton 2006).

The notion of 'originality' (comprising both Adaption and Innovation) as a major component of creativity, which is synonymous with novelty, can be traced back to Kant who, to avoid original nonsense, introduced value (today interpreted as 'usefulness') as a second component of 'exemplary genius.' These discussions of 'exemplary genius' inform later descriptions of the inspirational creative person, namely Rogers' (1959) 'creative loner.' It is this description by Rogers that informs the theoretical background to Kirton's 'Innovator', and thus is implicit in the items that have an Innovative face validity, for example, a person who proliferates ideas.

Western measures of creativity tend to emphasize idea originality over value aspect. Guilford's (1971) 'alternate uses,' for instance, show that 'originality' tends more towards a characteristic of the persons producing the ideas; whereas value or usefulness is anchored within the context through which the idea/ artefact is introduced. A non-Western conception of originality might place greater emphasis on the notion of beauty and "the aesthetic point of view" or even social usefulness of the idea/artefact rather than on the characteristics of the individual creative person per se; thus removing any linkage between individual differences (*Ibid*). In such a configuration Western variables/items associated with 'Sufficiency of Originality' can become unrelated - or even negatively related - to an non-Western view of Innovative creativity. Thus, in non-Western cultures the 'inner person' can be seen as less relevant in explaining the causation of behaviour than are the wider aspects of 'personhood', particularly when the situation dictates a complex web of social obligations and roles (Heine & Buchtel 2009). What is clear is that concepts such as creativity and innovation are obviously well understood, however, variables based on the 'inner person' and the values of self-direction, hedonism and stimulation may not be the root towards understanding the processes in non-Western cultures. McCrae (2001) noted a similar effect with the Big five personality inventory where the least clear representations of the big five factors across cultures (defined by language difference) is Openness (with its links to creativity).

On the other hand, a widened view of creativity, outside the "originality" and "novelty" configurations, is that originating in Schopenhauer (1819/1966) in relation to an aesthetic attitude or aesthetic experience, a psychological state associated with transcendence of the commonplace to a 'better consciousness' wherein an object is perceived unfettered of purpose, to a direct free-floating engagement with the platonic forms, or the Kantian 'things-in-themselves', the communion with such being the basis for art creation and its appreciation. This uplifting towards experiencing a wholeness and unity with the universe (a dissolving of the ego/self) appears central to Eastern religious and philosophical traditions, as well as to the values of Universalism and Benevolence (Schwartz, 1992)

In the case of the KAI scale, the items of Adaption and Innovation are expected to be of opposite polarity. The majority, some 21 adaptive items are reverse-scored to align with the 11 positively-scored Innovative items and produce a coherent overall scale. However, when the same items are responded to by individuals from Thai culture, both Adaptive and Innovative items while maintaining balanced scores (see Table 2, Appendix 2) move in relationship from being in opposition to a position where they all have the same (Adaptive) polarity. In this study, unlike most previous studies, there are negative items maintaining their correct relationship while the positively scored items change phase. So, in addition to the need for item-by-item understanding, the cognitive process or conceptual framework within which each item is

understood and evaluated by the individual is seen an important mechanism.

In Kirton's Kai, the 'cognitive context' is anchored by the instruction "How easy or difficult do you find it to present yourself consistently over long periods as: (e.g. a person who has fresh perspectives on old problems)"? This instruction is generally considered as best tapping a cognitive 'preference,' thereby filtering out the actual behaviour response related to how a person may monitor his or her overt behaviour so that it is more fitting with situational and/or cultural demands. However, even when the KAI is used in a Western culture context, this anchor is sometimes queried by respondents. Thus just as the notion of 'self' is understood differently in Western vs. non-Western cultures (e.g. Markus & Kitiyama. 1991), the notion of 'preference' may also be more complex. In general use 'preference' expresses a favourability of one thing over another, for example, "I would prefer tea rather than coffee". Or in situations where there is a less perceived choice, such as with dispositional traits, we might say "I prefer to write left-handed". However, at another level, we might use preference to describe a wish of some desired state. "I would prefer if it were sunny for the trip tomorrow". In this way, preference could in these differing senses, be used to describe both (a) my left-handedness as a dispositional state, and the different point (b) that I might still prefer to be right-handed, making life easier in a predominantly right-handed world. In the latter instance, preference seems to describe an ideal desired state of affairs irrespective of personal predilection of disposition or taste.

The difficulties in the use of the term 'preference' may cause it to be understood, particularly in a non-Western setting where as we have already noted, there may be a tendency to place higher value on expectations from others than on personal traits as a desired state, causing in effect, a tendency to complete the items as a 'wish list' (as described above). Such a position would lead to an outcome consistent with the findings of this study, particularly the anomalies surrounding the innovative items. A similar effect may apply to scale anchors that use Agree/Disagree to illuminate the apposing poles.

Furthermore, irrespective of the final understanding of the term 'preference,' the cultural expectations of the many social groups that any individual may be related to results in individual personal preferences being relegated to a secondary position (Lebra 1976). These social groups, which are formed from birth onwards, exert a strong, cohesive in-group pressure to conform. The relationships, coupled with high expectations of power being exercised as part of status, lead to behaviours that follow the traditions of both social hierarchy and family.

Similar effects have been observed by Nesbett (2004) and Bagozzi et al. (1999) where both cultural rules and group conformity along with conflict avoidance lead to a 'Middle Way' of individual decision making. This middle way nullifies the scale constructs such that all items (both positively and negatively related to the concept) are seen as comprising a single, uniformly related, holistic group and are assessed accordingly. These findings lead to the question of whether there is an East/West dichotomy or a bipolar continuum that shapes these differences.

In summary, the cognitive framework within which the items are understood and evaluated and the way individuals are connected to a number of different social groups, where the behavioural expectations of the groups are primary are all at the root of major differences in the way items in any measure are evaluated. In differing cultures, personal preferences and other personal attributes can vary in importance from primary to secondary.

In Thai culture, they become secondary considerations masked by the many different situational expectations. This fragmented set of expectations, which are pervasively adaptive, impacts the overall measure's factor structure. Each of the factors extracted contain items from

all three KAI factors (SO, E and R). However, if the more significant markers of the three KAI factors are subjected to a factor analysis, a simple orthogonal structure emerges with the three factors clearly distinguished - albeit with a negative SO factor. So, while the total scale is still treated as a single holistic group, the different statistical content of the three factors is evident and provides a foundation for the construction of an improved measure. In such a measure, SO may need to encompass a different concept of 'originality' or a broader bandwidth (Cheng & Wang 2009) before it is relevant to cultures of the East. Among possible candidates may be the 'aesthetic attitude,' the propensity to perceive balance, proportion, platonic forms and patterns connecting and underlying perceptions and concepts, as a facet of creativity better understood in non-Western cultures than 'originality' per se, based on ideas and problem solving activity.

While quantitative information can still be generated and extracted from the measure, the constructs and structural relationships of the measure, when used in the target culture, do not represent the concept as defined in the originating culture. With the pole of the concept that represents Innovative problem solving behaviours 'hidden' (Kelly 1963), the measure is best described as uni-polar and of increasing adaptability (with factors E and R scored positively). Particularly as the SO factor in such a configuration correlates positively with both E and R and, as such, is conceptually indeterminate and adds little to the conceptual fidelity of the measure.

Conclusions

It is clear that concepts can be seen as universal collections of information that are understood in much the same form by all different cultures. However, any associated measure that uses behavioural statements to evaluate the concept may comprise both *etic* and *emic* components. For Thai nationals, the cultural lens transforms the culture-specific (*emic)* behaviours that relate specifically to western culture into a situationally-expected form.

In a society where sociality and conformity is highly valued, the resulting strong cohesive nature of acceptable behaviours tends to submerge personal preference as well as the item behaviours associated with the measurement of 'originality.' These effects result in the item behaviours being evaluated as whether they are situationally expected rather than whether they represent a personal preference. This transformation, where preferences are suppressed, results in items that may not evidently be opposites, but represent the two poles of a bipolar measure, all being scored as part of the same holistic group. Furthermore it is the relationship between the two set of polar items that vary rather than any significant bias in the item scores for either pole.

Whether a concept such as Adaption-Innovation along with its associated bi-polar measure (the KAI), the latter so heavily dependent on personal preferences and, in the Thai context, described by behavioural items, may be situationally expected and unexpected and could ever work using its present content, is still questionable; particularly if the content of the 'sufficiency of originality' factor is understood completely differently within the cultures of East and West.

These effects are important to researchers engaged in construction of cross-cultural measures. With the convergence of the dimensions of the culture and personality domains, the way the value profile of culture varies when measuring individual differences becomes a major concern. One implication here being that, in addition to the translation of items from one language to another, or (as in the current study) the second language abilities of the subjects, there is the cognitive framework within which the items are understood and evaluated that might also need careful consideration. The more distant the target culture

is from the originating culture, the greater the potential need for reconstruction of the facets as well as translation of the items. Furthermore, cross-cultural effects seem to apply more to narrow band measures (e.g., 'sufficiency of originality') than to measures with a wider bandwidth. In the latter case, the addition of associated facets enables a broader cultural coverage, for example, 'Openness' in the measure of the big five personality concepts (McCrae 2001).

Finally, when measures are designed to include items that represent both poles of a construct, the need for a significant number of negative items (beyond the number normally used to control for response bias) will render the measure structurally inappropriate when used in a culture that supports the concept of Holism.

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Appendix 1

- Sample Characteristics

Sample 1

This group was given a brief overview of the A-I concept and the guidance notes on the questionnaire were read through and discussed. Completion of the 'Name' in the demographic information was not required if the respondent wished to remain anonymous. The main sample characteristics are as follows:

Number in sample n=22
Mean Age: 35 years (Estimate)
Gender: 32% Female, 68% Male
Education: All of the samples were holders of a first degree and studying part time for a Masters degree in Organisational Development.
Occupation: Teachers of primary and secondary students at a private school.

Sample 2

The individuals of Sample 1 collected the contributors to Sample 2 as a convenience sample. These contributors were asked to complete the inventory by following the instructions on the form. Completion of the 'Name' in the demographic information was not required. The main sample characteristics are as follows:

Number in sample: n=71
Mean Age; Not known
Gender: 51% Female, 49% Male
General Occupation: General population some bias towards teaching profession

Sample 3

This group was given a written, brief overview of the A-I concept and the guidance notes on the questionnaire were read through and discussed. Completion of the 'Name' in the demographic information was not required if the respondent wished to remain anonymous. The main sample characteristics are as follows:

Number in sample n=24
Mean Age: 30 years (Estimate)
Gender: 46% Female, 29% Male, 25% Missing
Education: All of the samples were holders of a first degree and studying part time for a Masters degree in Business Administration
General Occupation: Marketing and Administrative specialisations

Sample 4

This sample was given a brief overview of the A-I concept and the guidance notes on the questionnaire were read through and discussed. Additionally the difference between how they actually behave or how, as an individual, they would prefer to behave examined. The focus of 'how they would prefer to behave' was emphasised as the required anchor for the respondents to use when completing the questionnaire. (This point is also made in

the Guidance notes at the top of page of the Kai inventory but a few people disregard this point and complete the questionnaire from the focus of how they actually behave which is more situational than that of preference) The main sample characteristics are as follows:

- Number in sample n=22
- Mean Age 30 (Estimate)
- Gender: 68% Female, 32% Male
- Education: All of the samples were holders of a first degree and studying part time for a Masters degree in Organisational Development.
- Occupation: Teachers of primary and secondary students at a private school.

▪ *Sample 5*

This group was given a brief overview of the A-I concept and the guidance notes on the questionnaire were read through and discussed. Completion of the 'Name' in the demographic information was not required if the respondent wished to remain anonymous. The main sample characteristics are as follows:

- Number in sample n=27
- Mean Age: 30 years (Estimate)
- Gender: 22% Female, 30% Male, 48% Missing
- Education: All of the sample were holders of a first degree and studying part time for a Masters degree in Business Administration
- General Occupation: Marketing and Administrative specialisations.

▪ *Sample 6*

This group was given a brief overview of the A-I concept and the guidance notes on the questionnaire were read through and discussed. Completion of the 'Name' in the demographic information was not required if the respondent wished to remain anonymous. The main sample characteristics are as follows:

- Number in sample n=36
- Mean Age: 21 (Estimate)
- Gender: 67% Female, 33% Male
- Education: Final Year Art and Design students
- Occupation: Full-time Students

Thank are due to the students of Assumption and Chulalongkorn Universities and St Gabriel's College for providing the samples used in this study

Characteristics of Thai Samples

Variable	Sub-Sample 1	Sub-Sample 2	Sub-Sample 3	Sub-Sample 4	Sub-Sample 5	Sub-Sample 6	Total Thai Sample	Standard Sample
Sample Size (n)	22	71	24	22	27	36	202	562
Kai (group mean)	89.64	91.23	95.79	92.05	92.3	91.42	92.0	95.00
Kai Std Dev	5.55	9.47	9.93	9.62	5.11	9.61	8.81	17.90
Kai Range	81-100	74-116	76-123	75-124	85-106	65-106	65-124	45-145
Item-total r (mean)	-0.001	+0.041	+0.06	+0.04	-0.01	+0.05	+0.04	+0.19
Item-total r (min)	-0.76	-0.52	-0.64	-0.68	-0.62	-0.68	-0.39	-0.11
Item-total r (max)	+0.75	+0.61	+0.62	+0.71	+0.56	+0.79	+0.48	+0.57
Scale Alpha	-0.11	+0.60	+0.67	+0.58	-0.19	+0.60	+0.54	+0.88
Factor SO	41.77	40.25	41.75	41.23	40.56	40.33	40.76	40.78
Factor E	17.46	18.47	20.71	18.64	19.33	19.42	18.93	18.82
Factor R	30.41	32.51	33.33	32.18	33.41	31.67	32.31	35.39
Theoretical SO	38.55	39.23	41.19	39.58	40.12	39.31	39.65	40.85
Theoretical E	19.23	18.25	19.16	18.41	18.66	18.28	18.40	19.00
Theoretical R	33.17	33.76	35.44	34.06	34.52	33.82	34.04	35.15
SO items (mean) (Positive scored)	3.21	3.10	3.21	3.17	3.12	3.10	3.14 Alpha 0.51	3.14 Alpha 0.83
E+R item (mean) (Positive scored)	3.48	3.32	3.16	3.33	3.22	3.31	3.30	3.15
E+R items (mean) (Negative scored)	2.52	2.68	2.84	2.67	2.78	2.69	2.70 Alpha 0.78	2.85 Alpha 0.86
Correlation SO with E	-0.77***	-0.47***	-0.06	-0.25	-0.49**	-0.38*	-0.38***	+0.22***
Correlation SO with R	-0.31	-0.47***	-0.04	-0.28	-0.45*	-0.16	-0.30***	+0.45***
Correlation E with R	+0.15	+0.73***	+0.78***	+0.48*	+0.44*	+0.57***	+0.61***	+0.49***
Correlation SO with E+R	-0.65***	-0.51***	-0.05	-0.31	-0.55**	-0.29	-0.37***	+0.41***

Appendix 2

Table 2 Item-Score Distribution

Item No	Lower Two Scores	Upper Two Scores
Item1	-	-
Item2	49.5	25.8
Item3	26.7	55.0
Item4	50.0	28.2
Item5	33.2	40.1
Item6	48.0	22.8
Item7	47.5	35.1
Item8	46.5	24.1
Item9	50.5	26.3
Item10	47.0	32.1
Item11	23.3	54.5
Item12	27.7	51.5
Item13	57.9	20.3
Item14	41.1	33.2
Item15	45.0	25.2
Item16	24.8	50.5
Item17	56.9	22.3
Item18	45.0	33.2
Item19	23.8	49.0
Item20	63.9	15.4
Item21	28.2	49.5
Item22	45.0	26.8
Item23	22.8	48.5
Item24	55.0	29.3
Item25	55.4	24.8
Item26	31,2	43.1
Item27	40.6	30.7
Item28	46.0	29.7
Item29	59.4	19.8
Item30	55.9	20.8
Item31	30.7	40.6
Item32	46.5	32.7
Item33	49.5	26.7

Only two items 20 & 29 fail to meet the criteria set by Maxwell.

Table 5 Item-Total Statistics 29-item scale

Item Number	Factor Label	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Kai3r	SO	75.4653	165.474	.355	.298	.834
Kai4	E	75.3861	163.890	.362	.273	.834
Kai5r	SO	75.1535	167.971	.248	.338	.838
Kai6	R	75.3762	161.490	.525	.442	.829
Kai7	R	75.2228	167.577	.231	.279	.839
Kai8	R	75.2228	168.373	.220	.313	.839
Kai9	R	75.3960	164.220	.378	.288	.834
Kai10	R	75.2574	166.680	.284	.323	.837
Kai11r	SO	75.4604	165.991	.345	.265	.835
Kai12r	SO	75.3762	167.350	.273	.181	.837
Kai13	SO	75.5743	167.350	.282	.271	.837
Kai14	E	75.2129	164.208	.385	.298	.833
Kai15	E	75.3614	162.610	.422	.372	.832
Kai16r	SO	75.4257	164.604	.393	.421	.833
Kai17	E	75.5495	162.816	.453	.371	.831
Kai19r	SO	75.3762	167.002	.290	.290	.836
Kai20	R	75.7871	162.984	.417	.318	.832
Kai21r	SO	75.3762	162.843	.419	.349	.832
Kai22	E	75.3267	162.380	.487	.376	.830
Kai23r	SO	75.4158	162.254	.487	.402	.830
Kai24	SO	75.4208	162.991	.406	.351	.833
Kai25	E	75.4653	163.623	.413	.294	.832
Kai26r	SO	75.2327	169.493	.186	.237	.840
Kai27	R	75.2178	167.505	.284	.225	.837
Kai28	E	75.2921	167.014	.266	.197	.837
Kai29	R	75.5594	161.482	.526	.451	.829
Kai30	R	75.5149	162.669	.450	.438	.831
Kai32	R	75.2871	163.559	.336	.274	.835
kai33	R	75.3663	166.293	.297	.276	.836

SO = Sufficiency of Originality E =Efficiency R= Rule

Table 7 - Rotated Three Factor solution for the Thai sample using the 2- item scale

Item Number	Factor Label	Factor		
		1	2	3
kai33	R	.617		
kai29	R	.603		
kai30	R	.589		.319
kai4	E	.481		
kai28	E	.463		
kai9	R	.456		
kai25	E	.448	.231	
kai13	SO	.411		
kai32	R	.401		
kai20	R	.384	.249	
kai14	E	.354	.309	
kai12r	SO	.254		
kai16r	SO		.678	
kai6	R		.623	.256
kai19r	SO		.508	.282
kai3r	SO		.492	
kai11r	SO		.471	
kai27	R		.458	
kai17	E	.255	.447	.280
kai23r	SO	.420	.427	
kai22	E	.387	.396	
kai26r	SO		.385	
kai21r	SO	.351	.382	
kai8	R	.272		.628
kai7	R			.623
kai15	E		.363	.502
kai10	R	.449		-.457
kai24	SO	.360		.413
kai5r	SO		.391	-.397

SO = Sufficiency of Originality E =Efficiency R= Rule/Group Conformity/Group Conformity