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Validation of a Personality Assessment Tool (TCI-R) in a Cross-cultural Sample of Young Managers

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Abstract

Objective: We propose a positive psychology approach to the assessment of personality in young international managers using the Temperament and Character Inventory (TCI-R) that is based on Cloninger's biopsychosocial model. In the present study, we first aim to examine whether there were systematic differences in personality traits as measured by the TCI-R, between international young managers and the population that has until now been used as normative US population. Secondly, we aimed to validate the TCI-R in a cross-cultural population of young managers so to provide more appropriate normative data for personality assessment.

Methods: 442 MBA students of an international business school in Spain completed the TCI-R. Data were collected between 2012 and 2017. Participants were from 58 nationalities, between the age of 25 and 38. For comparative analysis, we analyzed differences between our sample and normative US population on each TCI-R personality dimension and subscale. For validation, we analyzed gender, age, and cultural differences on TCI-R dimensions and facets, and we assessed factor structure.

Results: We found significant differences between our international MBA sample and US normative data for almost all dimensions of personality. The TCI-R showed good psychometric properties in our international sample. The original TCI-R seven-factor structure was confirmed with a good fit. Overall, our findings suggest that the TCI-R is a valid and reliable tool for personality assessment amongst international young managers. The insights from our study might be useful for educational purposes, namely MBA programs. In particular, we believe that they could contribute to developing positive leadership competencies.

Keywords: personality, assessment, temperament, character, leaders

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Introduction

Young managers increasingly face competitive pressure in a constantly changing, globalized business world. The high spinning of the wheel often causes personal struggle for young managers in order to reach and maintain optimal wellbeing. Given that many unpleasant outcomes from such struggle may affect both personal and organizational spheres, understanding what traits characterise young managers' personality comes in aid. When aiming at preventing or overcoming the hardships that derive from high-pressure situations, young leaders would benefit a great deal from valuable insights on their personality patterns. There is a large body of research which has investigated personality traits in young managers, however for the most part literature has taken the perspective of the Five Factor Model (Costa & McCrae, 1992). We believe instead that taking a positive leadership perspective on personality traits may better fit the purpose of enhancing wellbeing amongst young leaders.

More specifically, we propose an investigation of young leaders' personality in accordance with Cloninger's biopsychosocial model (Cloninger, Svrakic & Przybeck, 1993). Cloninger's model has mainly been developed to contribute to the science of well-being (Cloninger, 2006; 2011) and thus, provides a well-suited approach to the problem of young leaders' struggle with adaptive personality. Furthermore, Cloninger's model offers the possibility to use a well-known, valid instrument for the assessment of its theorized components of personality: the revised Temperament and Character Inventory (TCI-R) (Cloninger, 1999). The TCI-R is a self-report questionnaire that has been used extensively in psychiatry and psychological research providing useful clinical guidelines to the study and treatment of personality disorders. For its capability of discerning between moderately inherited temperament dimensions and adaptive individual differences in character, the TCI-R represents a useful measure of personality from a positive psychology perspective that emphasises one´s ability to improve and modify aspects of one´s self based on that which already works well (Kaplan & Kaiser, 2010).

In line with Cloninger's biopsychosocial personality model, the TCI-R discriminates between 4 Temperament dimensions: Novelty Seeking (NS), Harm Avoidance (HA), Persistence (PS), and Reward Dependence (RD); and 3 Character dimensions: Self-Directedness (SD), Cooperativeness (CO), and Self-Transcendence (ST). Each high order dimension includes several facets of personality (29 subscales in total). See Exhibit 2 for brief description of each facet.

As for its psychometric properties, the questionnaire has been proven to be a valid and reliable assessment tool in different languages (Belgian, Hansenne, Delhez, & Cloninger, 2005; Brazilian Portuguese, Maffasioli-Goncalves & Cloninger, 2010; Greek, Giakoumaki, et al., 2016; Italian, Martinotti et al., 2008; French, Pelissolo et al., 2005; Bulgarian, Tilov et al., 2012), both in clinical and non-clinical populations (Cloninger, Bayon, & Svrakic, 1998; Vitoratou, et al., 2015; Monasterio, et al., 2016; Porubanova-Norquist, 2012). The TCI-R thus represents an optimal tool for the investigation of young leaders' personality from a positive psychology perspective.

Another reason to undergo our investigation is the lack of studies that validate the TCI-R questionnaire across cultures. To our knowledge, until now TCI-R normative data have only been provided on the basis of nationality and/or language. In fact, most of the times results are interpreted based on a sample pooled from general US population that Cloninger used to design the original TCI-R. However, given the ever-growing cultural heterogeneity of the population of young leaders in today's globalized world, we believe ad hoc normative data that take into account ethnic, linguistic, and cultural differences are needed. The information obtained using such normative data based on peers could enhance the use of TCI-R for educational and developmental purposes in leadership courses for young managers (for instance, MBA programs).

The present study is outlined as follows. We first compare our international sample to normal US population in order to analyse differences in personality dimensions and facets as measured by the TCI-R. We then evaluate the TCI-R psychometric properties in our international sample, providing normative data for young leaders' personality assessment. We finally discuss research and practical implications for young leaders and training.

More specifically, we hypothesize that:

1. There will be significant differences in personality between our sample of international MBA students and the US normative population;
2. The TCI-R questionnaire will present valid psychometric properties in our international sample.

Methods

Sample

The sample used for this study was originally composed of 506 students enrolled in a Management and Business Administration program of an international business school in Barcelona, Spain. We consider a sample of MBA students to be highly relevant for the purposes of this study, as MBA graduates "represent one important source of future leaders"(Benjamin, & O'Reilly, 2011). Students are admitted to the program based on selective criteria of previous academic and professional experience, including Graduate Management Admission Test (GMAT, Graduate Management Admission Council, ®2002-2017) score, and, for non-native English speakers, English proficiency standardized tests scores. We selected only those students who were between the age of 25 and 38 years old (87.9%) because we believe them to be more representative of MBA international students' population. After inspection, 6 participants were excluded because of missing data on demographics variables such as age (0.6%) and nationality (0. 4%), the final sample consisted of 442 students.

The mean age was 32.2 years (SD = 2.91). Participants were 66.1% male from 58 nationalities across the globe. For summary and analysis purposes, we divided the sample into 9 inclusive cultural clusters based on GLOBE classification (House at al., 2004) with specific minor modifications (see Exhibit 1). 20.6% of the students were from Confucian Asia, 19.7% were from the Anglo cluster, 15.4% were form South Asia, 13.1% were from Latin Europe, 11.8% were from Germanic Europe, 7.7% were form Latin America, 5.9% were from Eastern Europe, 5.0% were from Middle East, and 0.9% were from Sub-Sahara Africa[1]. Data were collected between September 2012 and February 2017, hence throughout five academic years: 21.5% of the students took part in the study in the academic year 2016/2017; 19% in 2015/2016; 20.1% in 2014/2015; 20.4% in 2013/2014; and 19% in 2012/2013.

Procedure and Measurements

Participants were asked to participate in the study as part of an elective course on leadership. Participation in the study was not a compulsory requirement for the course and participants did not receive extra credits. The research purpose of the study was disclosed to participants who gave their consent to data usage under confidentiality. All participants in the study completed

[1] Given the small number of participants from Sub-Sahara Africa, we did not report analysis and results regarding cultural differences for this specific cluster.

the TCI-R online. However, participants could choose the preferred language version of the questionnaire before starting completion. Given the geographical position of our business school, we decided to include as options two different versions of the TCI-R made available, in English (Cloninger et al., 1999) and in Spanish (Gutierrez-Zotes et al., 2004). 95.2% of all participants completed the English version, and 4.8% completed the Spanish version. Both versions have been shown to have reliable and valid statistical properties, and have been broadly used, hence we consider both suitable for our purposes.

After completing the questionnaire, participants received a personalized feedback about their personality features. The feedback provided individual raw scores on each TCI-R dimension and facet, as well as percentile ranking, all followed by a short description of results. Rankings were based on corresponding normative data depending on the language version selected by each participant. Participants were not previously screened for mental issues, and personality features were assessed solely using the TCI-R which comprises of 240 items measured on a Likert scale from 1 (definitely false) to 5 (definitely true).

Statistical Analysis

Most analyses were carried out using IBM SPSS Statistics software (version 23) except for calculation of effect sizes where Excel was employed. α level of significance was set to .05 for all tests. A series of independent two-sample t-tests were performed to analyse gender differences on main dimensions of TCI-R in our sample. Age correlations with TCI-R dimensions were analysed with Pearson's correlation coefficients (*r*). Differences in TCI-R dimensions for each cultural cluster were examined with single Analysis of Variance (ANOVA) tests followed by post-hoc analysis: Bonferroni correction was used when group variances were equal; Games-Howell procedure was used to control for unequal group variances.

For comparative analysis, we examined differences between our international sample of MBA students and US normative population on both dimensions and facets of TCI-R. The US normative data derive from a validation study with a stratified random sample of 962 adult subjects, aged 18 years and older, residing in the City of St. Louis, Missouri, USA (Cloninger, personal communication, 2013). Firstly, we standardized and transformed TCI-R raw scores into T-scores (Mean=50, SD=10) using normative US data (i.e., means and standard deviations) for each dimensions and facets. Given scales raw scores were calculated on a different number of items, standardization provided a homogeneous interpretation of results, expressed in terms of standardized means differences. We then performed independent one-sample *t* tests with a set value of 50 (mean in T distribution) entering each dimension and facet as dependent variable.

In order to evaluate the psychometric properties of TCI-R in our international sample, we examined associations among TCI-R dimensions with Pearson correlations (*r*). Factor structure was assessed independently for Temperament and Character subscales using principal component analysis (PCA) with Promax rotation method. Percentage of variance explained by each factor was reported as an index of goodness of fit. All 240 items and 29 facets were previously inspected for normal distribution both graphically and statistically (no outliers deletion was deemed necessary). Means and standard deviations for each dimension and facet were calculated to provide normative data: for facets, means equal to the sum of the means on each respective item; for dimensions, means equal to the sum of the scores on each respective facet. Reliability of both facets and dimensions were assessed using Cronbach's alpha coefficient (α).

Results

Sample

Men were older than women (M_M=32.6 vs. M_W=31.3, t(440)=4.455, p=<.001, d=-.45). Age means across cultures ranged between 33.4 years (SD=2.79) for Confucian Asians and 30.54 years (SD=2.45) for South Asians. Results from an omnibus one-way ANOVA showed a significant difference in age depending on cultural cluster (F(7,430)= 7.908, p<.001, ω^2=.10). Post-hoc multiple comparison analysis revealed that Confucian Asia cluster included significantly older participants than South Asia ($M_{CA\text{-}SA}$=2.85, p<.001), Middle East ($M_{CA\text{-}ME}$=2.17, p=.03), and Anglo ($M_{CA\text{-}A}$=1.88, p<.001) clusters. Also, South Asia cluster included significantly younger participants than Latin Europe ($M_{SA\text{-}LE}$=-2.34, p<.001), Latin America ($M_{SA\text{-}LA}$=-2.22, p=.004), and Easter Europe ($M_{SA\text{-}EE}$=-2.23, p=.012) clusters.

Gender, Age, and Cultural Differences on Main Dimensions of TCI-R

Women scored higher than men on Harm Avoidance ($M_{M\text{-}F}$=-7.925, t (440) = -4.263, p < .001, d=-.43), Reward Dependence ($M_{M\text{-}F}$=-3.978, t (440) = -2.620, p = .009, d=-.26), and Cooperativeness ($M_{M\text{-}F}$= -4.492, t(440) = -3.042, p = .002, d=-.31). These results are consistent with previous findings in cross-cultural validation studies (Maffasioli-Goncalves & Cloninger, 2010; Hansenne, Delhez, & Cloninger, 2005; Giakoumaki et al., 2016; Gutierrez-Zotes et al., 2004; Jaksic et al., 2015; Pelissolo et al., 2005). Age did not show any significant correlation with the TCI-R dimensions (M_r = |.03|).

Analysis of cultural differences on Temperament scales showed that for Harm Avoidance (F(7,430)=5.901, p<.001, ω^2=.07) the Germanic Europe cluster showed significantly lower scores than Confucian Asia ($M_{GE\text{-}CA}$=-19.07, p<.001), South Asia ($M_{GE\text{-}SA}$=-17.29, p<.001), Eastern Europe ($M_{GE\text{-}EE}$=-17.36, p=.002), Anglo ($M_{GE\text{-}A}$=-15.46, p<.001), and Latin Europe ($M_{GE\text{-}LE}$=-13.11, p=.005) clusters. The remaining Temperament scales did not show significant differences in terms of culture: Novelty Seeking, F(7,430)=1.583, p=.14; Reward Dependence, F(7,430)=1.825, p=.08; Persistence, F(7,430)=1.202, p=.30.

Cultural differences in Character were found for Self-Directedness (F(7,430)=2.545, p=.014, ω^2=.02). More specifically, Germanic Europeans showed significantly higher scores than South Asians ($M_{GE\text{-}SA}$=12.09, p<.017), and Confucian Asians ($M_{GE\text{-}CA}$=11.70, p<.013). Differences were also found for Cooperativeness (F(7,430)=3.935, p<.001, ω^2=.04) where the Anglo cluster showed significantly higher scores than Eastern Europe ($M_{A\text{-}EE}$=11.97, p=.006), and Confucian Asia ($M_{EE\text{-}A}$=8.54, p=.003). Finally, for Self-Transcendence (F(7,430)=3.78, p=.001, ω^2=.04) we found that South Asia cluster showed higher scores than Eastern Europe ($M_{SA\text{-}EE}$=13.52, p=.018), and Anglo ($M_{SA\text{-}A}$=10.40, p=.001) clusters.

Comparative Analysis

Comparing TCI-R scores obtained from our participants with those derived from US normal population, resulted in outlying a specific MBA personality profile. In terms of Temperament (see Table 1), overall MBA students reported higher scores in all facets of Novelty Seeking dimension (i.e., Exploratory Excitability, Impulsiveness, Extravagance, Disorderliness) than US normal population. Also, significant differences were found for all facets of Persistence dimension. However, in this case, three facets namely, Work Hardiness, Ambitiousness, and Perfectionism were higher, while Eagerness of Effort was lower in comparison to US normal

population. MBA students reported lower scores on Fear of Uncertainty, Shyness, and Fatigability (three facets of Harm Avoidance dimension) than US population, but no differences were found on the facet Anticipatory Worry. Finally, there were differences for three facets of Reward Dependence: Sentimentality, lower in MBA students, and Openness to Warm Communication and Attachment, both higher in MBA students than in US population. The mean difference on Dependence was not significant.

As for Character dimensions (see Table 2), Self-Acceptance and Enlightened Second Nature were lower in MBA students than in US population, while Responsibility was higher. There were no significant differences between MBAs and US population on the remaining two facets of Self-Directedness- Purposefulness and Resourcefulness. Regarding the Cooperativeness dimension, only Social Acceptance and Compassion were significantly lower for MBA students. However, mean difference on both Helpfulness and Pure-Heartedness, higher and lower respectively were marginally significant and again, scores were lower for the MBA population. The mean difference on Empathy was not significant. Finally, all three Self-Transcendence facets showed a significant difference. More specifically, MBA students reported higher scores for Self-Forgetfulness, but lower scores for both Transpersonal Identification and Spiritual Acceptance than general US population.

Factor Analysis

Associations between Temperament dimensions and facets are presented in Table 3. Within each dimension, relationship between facets were moderate to high. Across dimensions, Harm Avoidance was negatively correlated to Novelty Seeking (r=-.38), Reward Dependence (r=-.19), and Persistence (r=-.35). Reward Dependence was positively correlated to Novelty Seeking (r=.33) and Persistence (r=.10). Novelty Seeking was negatively correlated to Persistence (r=-.03), but not significantly. Also for Character (see Table 4), within dimensions, correlations between facets were all significant. Across dimensions, Cooperativeness was positively correlated to Self-Directedness (r=.37) and Self-Transcendence (r=.20). Self-Directedness was negatively correlated to Self-Transcendence (r=-.07), but not significantly. Between Temperament and Character dimensions, relationships were moderate to weak (see Table 5). The highest significant correlation was between Harm Avoidance and Self-Directedness (r=-.52), while the lowest was between Novelty Seeking and Self-Directedness (r=-.10). Overall, no isolated variables were observed, while moderate correlation coefficients indicated there were no problems of multicollinearity nor singularity in the data.

Two separate principal component analyses were performed for Temperament and Character dimensions with Promax rotation, extracting four and three factors respectively. In the PCA for Temperament, four-factor structure was confirmed accounting for 62% of the total variance (see Table 6). Factor 1 included all facets of Persistence, factor 2 included all facets of Harm Avoidance, factor 3 included all facets of Reward Dependence, and factor 4 included all facets of Novelty Seeking. Consistently, three-factor structure was confirmed for Character dimensions and facets, with 58% of the total variance explained (see Table 7). Only Self-Acceptance (facet 4 of Self-Directedness) positively loaded on factor 1 that included all others Cooperativeness facets. Factor 2 included the remaining four facets of Self-Directedness, and factor 3 included all facets of Self-Transcendence.

TCI-R Means and Internal Consistency

Table 8 and 9 show means, standard deviations, and reliability coefficients for both facets and dimensions of the TCI-R. Cronbach's alpha coefficients were above .80 for all seven dimensions demonstrating strong internal consistency. As for the facets, the reliability coefficients ranged between .52 for Disorderliness and .88 for Shyness and Spiritual Acceptance. These results show that despite cultural differences, and despite the fact that non-English speakers did not complete the questionnaire in their respective native language, the questionnaire is threaded in a coherent manner.

The Role of Age

Insofar, comparative analysis on TCI-R dimensions and facets have been conducted by comparing our sample of international young leaders with the entire US normative population. The normative data that derived from the TCI-R development study came from a stratified random sample of adults, age 18 years and older, and data available comprised of means and standard deviations on each dimension and scale at the general population level. However, from the personal correspondence with Cloninger, we could also obtain raw data stratified by age. Given our sample was made of young leaders we could also compare our sample to a specific age stratum of the US population. More specifically, we compared our sample of 25-38 aged MBA students with 22-35 aged US citizens. Although the specific age range of 22-35 years does not precisely match the age range of our sample, we believe a direct comparison on Temperament and Character scales of TCI-R will reveal interesting insights.

More specifically, this comparison will help us control for age effect on the broader differences between our sample and the entire US population. In the original study by Cloninger, age differences on TCI-R were not statistically tested therefore we do not know whether age could influence item response. In order to fully understand where personality differences are due to specific characteristics of young leaders, and are not only determined by age, we tested differences between our MBA students (N=442) and the specific age stratum of US population (N=175) on the TCI-R main dimensions. Also, comparing these results with those obtained by previous analyses that comprised the entire US population will hopefully help in underlying those strong personality differences that can exclude the influence of age, and at the same time providing a clearer picture of young leaders' personality form a positive psychology perspective.

For this aim, we transformed MBA's raw scores into T-scores based on age-stratum normative weights, and then we tested differences on TCI-R dimensions with several t-tests. Results from these analyses showed that when compared to their normative peers, our MBA students recorded higher Novelty Seeking and Reward Dependence, and lower Harm Avoidance. Persistence did not show significant difference. Also, MBA students showed higher Cooperativeness compared to their normative peers. Both Self-Directedness and Self-Transcendence did not show significant differences (see Table 10).

As we could see, comparing our MBA students' personality to those of either their normative peers or entire normative population led to different results, especially for what concerns the Character scales. The most stable dimensions across comparisons were Novelty Seeking and Harm Avoidance. Novelty Seeking was constantly higher in our MBA students for both comparisons, while Harm Avoidance was constantly lower. For what concerns these two dimensions, we can affirm an inherent difference in young leaders that is independent of age. We also noticed that statistical difference in Reward Dependence became significant when comparison was made with normative peers while such difference was not present when

comparison was made with the entire normative population. Given these results, we could say that controlling for age resulted in a more accurate description of young leaders' personality. The opposite situation appeared for Persistence. Statistical difference became non-significant when a comparison was made with normative peers as opposite to when comparison was made with the entire normative population. Here, we could conclude that age did in fact play a role in determining a difference between our MBA sample and normative population. Those differences in Persistence may derive from participants' age rather than their actual personality characteristics. However, despite statistical difference, what we also noticed is that for both comparisons, with peers and with entire population, Reward Dependence and Persistence were consistently higher in our MBA students. These last results may reflect an oscillation due to sample sizes rather than real personality differences across comparisons.

The most surprising differences emerged for the Character dimensions. According to the comparison between MBA students and US normative population, Cooperativeness did not show significant difference. However, when comparing our sample to their normative peers, Cooperativeness did show a significant difference with young leaders being more cooperative than their peers. This result confirmed Cooperativeness being a characteristic personality trait in young leaders that goes above and beyond age differences. Another point that adds to this conclusion was represented by the direction of the trait; indeed, without direct peer comparison, young leaders showed lower Cooperativeness even if not significantly so. Quite the opposite situation appeared for Self-Directedness and Self-Transcendence. In comparison to US normative population, MBA students showed significantly lower Self-Directedness and Self-Transcendence. However, when compared to their normative peers, MBA students no longer showed significant differences for these two character dimensions. Moreover, the direction of difference changed from lower to higher. Hence, it seemed the effect of age interfered with specific characteristics of young leaders' personality.

In comparison to what we found for Temperament dimensions, age not only influenced statistical significance for Character dimensions, but also changed the directions of personality differences.

Discussion

The first aim of the present study was to perform a comparative analysis between a sample of international MBA students and US normative population in order to test our hypothesis that available normative data (based on US general population) are not very accurate for assessing personality traits of young managers. Examining differences in personality as measured by the biopsychosocial model of Cloninger, we confirmed the relevance in establishing new normative data for TCI-R administration among cross-cultural population of young managers. When compared on TCI-R dimensions and facets, we found significant difference for almost all main dimensions and most of the facets. Young leaders are more prone to engage in exploratory and impulsive behaviours, while escaping low-activation situations (high NS). They are classifiable as daring, outgoing, and energetic (low HA), open to communication, and warm (high RD). Young leaders are overachievers showing determination, ambition, and perfectionism (high PS). From a positive psychology perspective, the differences on Character dimensions are even more relevant. Our population scored significantly higher in Responsibility, but lower on Self-Acceptance and Enlightened Second Nature (congruent habits). Although the overall dimension of Cooperativeness doesn't show significant differences, we found statistically significant differences in Social acceptance (higher) and Compassion (lower). Finally, our sample scored

higher in Self-Forgetfulness and lower in the other scales of Self-Transcendence (Transpersonal Identification and Spiritual Acceptance).

Also, given the international nature of our sample, we examined differences on TCI-R scores across nationalities. Overall, despite the sample comprising 58 different nationalities clustered in 9 cultural categories, differences on personality did not show often. When comparing cultural clusters among each other on the main TCI-R dimensions, only a few systematic differences occurred. More specifically, Germanic Europeans reported the lowest scores on Harm Avoidance and the highest scores on Self-Directedness. High Cooperativeness was distinctive in Anglo cluster. Finally, South Asians showed the highest scores for Self-Transcendence. Overall, these findings indicate that normative data derived from normal population may not be appropriate to assess personality in young leaders because of their systematic differences with normal population.

In this vein, we examined the psychometric properties of TCI-R in our sample with the aim of providing accurate normative data. The factorial structure of the TCI-R was consistent with Cloninger's differentiation between four Temperament and the three Character scales. As an index of goodness of fit, we reported percentage of variance explained by both the final solution and each single factor. Our results are in line with previous validation studies of the TCI-R in different languages (Gonçalves & Cloninger, 2010; Hansenne, Delhez, & Cloninger, 2005; Giakoumaki et al., 2016; Jaksic et al., 2015; Pelissolo et al., 2005). Reliability indices showed a very high internal consistency for all dimensions and facets, indicating that despite most of the subjects were not English native speakers, items were well comprehended. Also, gender differences here found are consistent with most previous findings (Maffasioli-Goncalves & Cloninger, 2010; Hansenne, Delhez, & Cloninger, 2005; Giakoumaki et al., 2016; Gutierrez-Zotes et al., 2004; Jaksic et al., 2015; Pelissolo et al., 2005). Overall, our findings confirmed the hypothesis that the TCI-R would show valid psychometric properties in a cross-cultural sample of young leaders, and thus could be used as an accurate tool in the assessment of their personality.

With the comparison analysis between our sample and US population between the age of 22 and 35, we showed that the effect of age provides a stronger and clearer personality profile of young leaders that would otherwise be missed by comparing it normatively to the general population only. However, we were able arrive to clearer conclusions, especially on the effects of age, only by looking at general differences with the entire population as well. A more in-depth analysis of these findings also add validation to the study of personality from a positive psychology perspective. The development of Cloninger's biopsyhosocial model of personality is related to the necessity to overcome the existing assessment limitations in explaining variations in maturity among adults, and therefore to include the analysis of character and its role in motivated behavior. Indeed, whereas Temperament was viewed as genetically independent, mainly uninfluenced by environment, and stable over time, Character was thought to be shaped by culture, learning, and life development. In this view, our results seemed to fit with what was theorized in the model. By taking into consideration the effect of age, we were able to better identify those variations due (or not due) to maturity that influence Character dimensions. While Temperament dimensions showed to remain quite stable, Character dimensions were the most affected by age. According to the model, those who have high Self-Directedness are regarded as autonomous and able to self-regulate their actions. It makes sense that when compared to the entire population, MBA students would show significantly lower Self-Directedness, and also that they would show no more nor less autonomy and self-regulation then their peers, given these two constructs are known to be very affected by maturity. The same applies to Self-Transcendence which was developed to assess the self-concept in relation to the world and

therefore includes experiences associated with spirituality and meditative practice. We might think that being young would favor a more pragmatic approach to life also considering the considerable larger amount of environmental stimuli yet present and sought for.

A curious result from a positive psychology perspective showed a higher level of Cooperativeness amongst MBA students when controlling for age effect. Cooperativeness dimension was developed to assess the self-concept in relation with others, and thus, in accordance with Cloninger's model, being highly cooperative would mean presenting acceptance and tolerance, accompanied by a high feeling of identification with others. The fact that MBA students showed to be more cooperative than their peers, may highlight a peculiar feature of young leaders. Evolutionary speaking, cooperation is fundamental in order to survive in a hostile environment. Drawing a parallel, cooperation among young leaders as a developed personality trait may represent a strength that allows them to better adapt to a highly demanding, highly competitive environments such as the globalized marketplace. Once again, we do not know whether age represented a statistically significant element in Cloninger's study, but cross analysing our data showed a possible effect of age also at normative population level especially for what concerns Character. These results may suggest a more fitting way to assess personality that would take into the account the effects of age.

Limitations

As already mentioned, one main limitation of this study is the underrepresentation of the Sub-Sahara African cluster. There are several reasons why this may happen. Firstly, low social economic status may impair African students' possibilities to access higher, expensive education such as MBA courses. Secondly, the geographical location of the business school where our sample was recruited has no easy access for Sub-Saharan countries. Future studies should provide a sample that is representative of more cultures in order to extend results to wider population of MBA students around the world.

Another limitation of this study may be the fully voluntary participation of students- only those students who decided to take an elective course on Leadership had access to the questionnaire. This may represent a sample bias as only students possibly already interested in the topic joined the course. Further studies should avoid such possible bias by extending access to the questionnaire also to those students who did not take the course.

Also, the restricted age criterion on the basis of which we excluded participants from analysis is arbitrary, and thus subjected to bias. The fact that age did not show any significant correlation with personality may derive from the fact that the small age range did not allow personality differences to emerge. In order to overcome this limitation, we proposed one way to statistically control for age effect on personality by comparing our sample to US normative peers. However, even doing so, limitations concerning sample size and unrecorded facets scores still remain.

Finally, for this study it was not possible to check for other types of validity other than TCI-R factorial structure, mainly due to parsimony for questionnaire administration as well as to an attempt to keep participants' attention level quite optimal throughout completion. Future studies should introduce the measurement of personality through different, already established questionnaires in order to assess construct validity. Furthermore, a follow-up study followed by a test-retest analysis would provide validation to TCI-R stability through time in its assessment property.

Practical Implications

The current study adds value to the existing TCI-R literature as it includes a specific group of young professionals- young leaders and MBAs- who will potentially play key roles in organizations. Leaders' personalities and soft skills can be just as crucial as knowledge and hard skills, especially after reaching a certain level within an organization. This underlines the importance of investigating further young leaders' temperament and character. Validating the TCI-R within MBAs from various cultural backgrounds provides a tool to do just that, and has several implications for practice and research.

Firstly, with this study we generated normative data to be taken into account when implementing TCI-R with people in leadership positions in international setting. In this way, we provide a more accurate and reality-based interpretation of the TCI-R instrument when assessing young leaders and managers. Furthermore, this study reveals important facets of the character and temperament of young leaders, and how they differ from the general population. This is valuable information for the development of business education and executive programs, as it provides guidelines for developing courses or training programs for young managers and MBAs in two ways. On the one hand, the use of the validated TCI-R within learning programs can increase and reinforce self-awareness, and the results can indicate which character components need to be trained and developed. On the other hand, the specific outline of an MBA profile which emerges from our results can guide trainers, practitioners and employers when educating and developing these professionals. Relying on data about the personality tendencies of MBAs and young leaders can help to focus effectively the content and the approach to executive education and training.

This study also contributes to the future research of personality profiles of MBAs and young managers. The TCI-R was found sufficiently reliable and valid in a cross-cultural sample, which provides a research instrument suitable for use within MBAs and young managers in international contexts. Hence, it constitutes a stepping stone in advancing research on personality in young leaders.

Researchers can investigate further if the profile that emerged from our data is replicated within other cross-cultural samples of young leaders, as well as study the impact and relevance of the different character dimensions in the business world. Further investigating MBAs and young managers' traits can eventually help identify which of them, if trained and improved, add most value to the lives of the young leaders, their work and their contribution to society. Employers and HR professionals can also benefit from knowing more about the tendencies related to MBAs' personalities, as it can help them with job-person fit and with selection processes.

Overall, we believe that by providing an optimized tool for exploring the tendencies of young leaders' personalities, our study contributes to developing long-term positive leadership characteristics.

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Exhibit 1

Cultural Clusters Inclusive of all Nationalities Present in the Sample

Cultural Cluster	Latin Europe	Germanic Europe	Eastern Europe	Middle East	Sub-Sahara Africa	Confucian Asia	South Asia	Anglo	Latin America
Countries	Andorra	Austria	Azerbaijan	Iran*	Ivory Coast	China	India	Australia	Argentina
	France	Belgium	Bulgaria	Kuwait	Nigeria	Hong Kong	Indonesia	Canada	Brazil
	Greece*	Denmark*	Georgia	Lebanon	Uganda	Japan	Philippines	Ireland	Chile
	Israel	Germany	Lithuania*	Morocco	Zimbabwe	Republic of Korea		South Africa (white sample)	Colombia
	Italy	Netherlands	Poland	Saudi Arabia		Singapore		United Kingdom	Dominican Republic
	Portugal	Norway*	Russian Federation	Turkey		Taiwan		United States of America	Honduras
	Romania	Switzerland	Ukraine	United Arab Emirates					Mexico
	Spain								Peru
									Venezuela

*Modifications: Greece originally listed under Eastern Europe cluster; Denmark, Lithuania, and Norway originally listed under Nordic Europe cluster; Iran originally listed under South Asia cluster.

Exhibit 2

Descriptors of Individuals With High and Low Scores on Temperament Subscales

Dimension	Subscale	High	Low
Novelty Seeking	NS1	**Exploratory excitability**	**Stoic rigidity**
		Routine intolerance	Routine preference
		Innovation	Change resistance
	NS2	**Impulsiveness**	**Reflection**
		Frequent revision	Analytical approach
		Distractibility	Focus
	NS3	**Extravagance**	**Reserve**
		Flamboyance	Control
		Wastefulness	Frugality
	NS4	**Disorderliness**	**Regimentation**
		Rule breaking	Rule abidance
		Improvisation	Rigidity
Harm Avoidance	HA1	**Anticipatory worry**	**Uninhibited optimism**
		Pessimism	Carefree
		Rumination	Disdainfulness
	HA2	**Fear of uncertainty**	**Confidence**
		Anxiousness	Hazardousness
		Stress	Change adaptation
	HA3	**Shyness**	**Sociability**
		Introversion	Extroversion
		Social inhibition	Audacity
	HA4	**Fatigability**	**Vigour**
		Tiredness	Energy
		Asthenia	Activity
Reward Dependence	RD1	**Sentimentalism**	**Hard-heartedness**
		Sympathy	Coldness
		Empathy	Insensitiveness
	RD2	**Openness to warm communication**	**Aloofness**
		Gregariousness	Solitude
		Social contact	Distance
	RD3	**Attachment**	**Detachment**
		Intimacy	Privacy
		Affability	Self-containment
	RD4	**Dependence**	**Independence**
		Indecisiveness	Self-sufficient
		Amenability	Non compliance
Persistence	PS1	**Eagerness of effort**	**Laziness**
		Diligence	Indolence
		Industriousness	Procrastination
	PS2	**Work hardiness**	**Spoiled**
		Determination	Defeatism
		Perseverance	Discourage
	PS3	**Ambitiousness**	**Underachievement**
		Sacrifice	Content
		Assiduousness	Shiftlessness
	PS4	**Pragmatism**	**Perfectionism**
		Efficiency	Workaholism
		Feasibility	Inflexible

Exhibit 2 (Continued)

Descriptors of Individuals With High and Low Scores on Character Subscales

Dimension	Subscale	High	Low
Self-Directedness	SD1	**Responsibility**	**Blaming**
		Self-determined	External attribution
		Trustworthiness	Unreliable
	SD2	**Purposefulness**	**Lack of direction**
		Long-term goals	Short-term goals
		Delayed gratification	Immediate gratification
	SD3	**Resourcefulness**	**Inefficiency**
		Competence	Unproductive
		Challenge	Insecure
	SD4	**Self-Acceptance**	**Self-striving**
		Self-Confidence	Low self-esteem
		Realistic	Unrealistic
	SD5	**Enlightened second nature**	**Inconsistency**
		Self-discipline	Self-defeating
		Self-trusting	Weak-willed
Cooperativeness	C1	**Social Acceptance**	**Social Intolerance**
		Friendly	Unfriendly
		Patience	Socially critical
	C2	**Empathy**	**Social disinterest**
		Consideration	Unconcerned
		Respect	Reserved
	C3	**Helpfulness**	**Unhelpfulness**
		Generous	Ungenerous
		Encouraging	Unsupportive
	C4	**Compassion**	**Revengefulness**
		Forgiveness	Active aggressiveness
		Benevolent	Passive aggressiveness
	C5	**Pure-Hearted conscience**	**Self-Serving advantage**
		Honest	Opportunism
		Sincere	Unfairness
Self-Transcendence	ST1	**Self-forgetfulness**	**Self-consciousness**
		Absorbed	Individuality
		High flow experience	Low flow experience
	ST2	**Transpersonal identification**	**Self-Differentiation**
		Strong connection to universe	Unconnected
		Idealism	Pragmatism
	ST3	**Spiritual acceptance**	**Rational materialism**
		Magical thinking	Objective empiricism
		High tolerance to unexpected	Scientific approach

Table 1

Comparative Analysis Between International MBA Students Sample and US Normative Population

Temperament Scales		Mean Difference	*t*	*p*	*d*
NS	**Novelty Seeking**	**8.04**	**15.187**	**<.001**	**0.72**
NS1	Exploratory Excitability	8.90	18.586	<.001	0.88
NS2	Impulsiveness	4.86	8.002	<.001	0.38
NS3	Extravagance	2.06	4.125	<.001	0.20
NS4	Disorderliness	6.85	14.481	<.001	0.69
HA	**Harm Avoidance**	**-2.87**	**-5.664**	**<.001**	**-0.27**
HA1	Anticipatory Worry	-0.32	-0.581	.56	-0.03
HA2	Fear of Uncertainty	-5.51	-10.287	<.001	-0.49
HA3	Shyness	-2.30	-4.655	<.001	-0.22
HA4	Fatigability	-1.52	-3.245	.001	-0.15
RD	**Reward Dependence**	**0.62**	**1.186**	**.24**	**0.06**
RD1	Sentimentality	-2.41	-4.374	<.001	-0.21
RD2	Openness to Warm Communication	1.68	3.257	.001	0.15
RD3	Attachment	1.83	3.554	<.001	0.17
RD4	Dependence	-0.17	-0.334	.739	-0.02
PS	**Persistence**	**1.41**	**3.107**	**.002**	**0.15**
PS1	Eagerness of Effort	-1.42	-2.921	.004	-0.14
PS2	Work Hardiness	1.38	3.104	.002	0.15
PS3	Ambitiousness	3.47	7.842	<.001	0.37
PS4	Perfectionism	1.31	2.400	.017	0.11

Mean differences are expressed in T scores units (M=50, SD=10)

Table 2

Comparative Analysis Between International MBA Student Sample and US Normative Population

Character Scales		Mean Difference	*t*	*p*	*d*
SD	**Self-Directedness**	**-2.16**	**-4.630**	**<.001**	**-0.22**
SD1	Responsibility	2.77	6.270	<.001	0.30
SD2	Purposefulness	0.24	0.478	.63	0.02
SD3	Resourcefulness	0.47	0.975	.33	0.05
SD4	Self-Acceptance	-6.21	-13.099	<.001	-0.62
SD5	Enlightened Second Nature	-2.18	-4.299	<.001	-0.20
C	**Cooperativeness**	**-0.63**	**-1.289**	**.19**	**-0.06**
C1	Social Acceptance	2.92	4.792	<.001	0.22
C2	Empathy	0.06	0.119	.90	-0.00
C3	Helpfulness	0.34	0.672	.50	0.03
C4	Compassion	-3.23	-6.056	<.001	-0.29
C5	Pure-hearted Conscience	-0.84	-1.892	.059	-0.09
ST	**Self-Transcendence**	**-1.8**	**-3.242**	**.001**	**-0.16**
ST1	Self-Forgetfulness	4.61	8.850	<.001	0.42
ST2	Transpersonal Identification	-2.75	-4.934	<.001	-0.24
ST3	Spiritual Acceptance	-5.57	-10.111	<.001	-0.48

Mean differences are expressed in T scores units (M=50, SD=10)

Table 3
Correlations Between TCI-R Temperament Dimensions and Facets

	NS	NS1	NS2	NS3	NS4	HA	HA1	HA2	HA3	HA4	RD	RD1	RD2	RD3	RD4	PS	PS1	PS2	PS3
NS1	.646**																		
NS2	.742**	.289**																	
NS3	.734**	.300**	.346**																
NS4	.559**	.257**	.286**	.170**															
HA	-.380**	-.357**	-.293**	-.145**	-.283**														
HA1	-.255**	-.118*	-.282**	-.098*	-.200**	.822**													
HA2	-.319**	-.308**	-.227**	-.076	-.328**	.749**	.509**												
HA3	-.363**	-.412**	-.200**	-.165**	-.265**	.746**	.424**	.432**											
HA4	-.239**	-.296**	-.181**	-.104*	-.083	.756**	.514**	.420**	.437**										
RD	.326**	.420**	.152**	.260**	.045	-.194**	-.068	.022	-.349**	-.198**									
RD1	.154**	.244**	.035	.152**	-.002	.159**	.172**	.159**	.001	.149**	.680**								
RD2	.370**	.418**	.183**	.265**	.150**	-.412**	-.231**	-.138**	-.548**	-.349**	.865**	.373**							
RD3	.291**	.384**	.150**	.190**	.075	-.249**	-.113*	-.013	-.387**	-.252**	.792**	.254**	.725**						
RD4	.091	.150**	.055	.145**	-.156**	.052	.046	.142**	.037	-.063	.628**	.466**	.330**	.300**					
PS	-.029	.184**	-.108*	-.054	-.066	-.350**	-.212**	-.221**	-.260**	-.406**	.102*	-.048	.204**	.139**	-.066				
PS1	.009	.154**	-.009	-.014	-.104*	-.310**	-.173**	-.138**	-.256**	-.407**	.197**	-.021	.298**	.208**	.035	.788**			
PS2	-.008	.157**	-.082	-.069	.023	-.331**	-.265**	-.267**	-.191**	-.304**	.037	-.048	.126**	.067	-.098*	.816**	.509**		
PS3	.045	.165**	-.048	-.004	.049	-.275**	-.151**	-.194**	-.229**	-.291**	.012	-.069	.102*	.079	-.148**	.818**	.476**	.591**	
PS4	-.138**	.131**	-.218**	-.094*	-.168**	-.243**	-.127**	-.144**	-.174**	-.325**	.078	-.002	.134**	.092	-.014	.862**	.571**	.645**	,608**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 4
Correlations Between TCI-R Character Dimensions and Facets

	SD	SD1	SD2	SD3	SD4	SD5	C	C1	C2	C3	C4	C5	ST	ST1	ST2
SD1	.738**														
SD2	.715**	.436**													
SD3	.742**	.559**	.593**												
SD4	.652**	.381**	.180**	.263**											
SD5	.801**	.438**	.588**	.568**	.279**										
C	.371**	.343**	.174**	.249**	.316**	.245**									
C1	.299**	.241**	.118*	.189**	.248**	.246**	.704**								
C2	.195**	.128**	.157**	.155**	.146**	.133**	.544**	.410**							
C3	.219**	.225**	.117*	.191**	.177**	.109*	.760**	.468**	.339**						
C4	.316**	.305**	.092	.169**	.321**	.200**	.820**	.452**	.259**	.497**					
C5	.230**	.250**	.146**	.168**	.156**	.137**	.611**	.110*	.124**	.396**	.431**				
ST	-.068	-.150**	.161**	.012	.124**	-.068	.199**	.004	.222**	.129**	.155**	.176**			
ST1	-.127**	-.154**	.114*	.047	-.218**	-.117*	.031	-.035	.097*	.012	.028	.003	.778**		
ST2	.005	-.089	.180**	.068	-.093	.023	.261**	.140**	.334**	.192**	.196**	.101*	.827**	.535**	
ST3	-.044	-.122*	.109*	-.063	-.016	-.065	.195**	.008	.137**	.117*	.155**	.265**	.843**	.423**	.554**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 5
Correlations Between TCI-R Temperament and Character Dimensions

	NS	HA	RD	PS	SD	C
HA	-.380**					
RD	.326**	-.194**				
PS	-.029	-.350**	.102*			
SD	-.100*	-.515**	.101*	.440**		
C	.000	-.246**	.458**	.131**	.371**	
ST	.126**	-.042	.287**	.160**	-.068	.199**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 6
Principal Component Analysis of Temperament Facets

	Factor 1 PS	Factor 2 HA	Factor 3 RD	Factor 4 NS
Ambitiousness	**0.88**	0.10	-0.17	0.16
Perfectionism	**0.87**	0.02	0.02	-0.19
Work Hardiness	**0.84**	-0.03	-0.13	0.03
Eagerness of Effort	**0.65**	-0.17	0.18	-0.19
Anticipatory Worry	0.11	**0.87**	0.06	0.04
Fatigability	-0.13	**0.76**	-0.16	0.14
Fear of Uncertainty	-0.07	**0.60**	0.26	-0.30
Shyness	-0.06	**0.58**	-0.22	-0.20
Dependence	-0.18	0.08	**0.77**	-0.20
Openness to Warm Communication	0.02	-0.27	**0.76**	0.10
Attachment	-0.02	-0.19	**0.74**	0.03
Sentimentality	0.06	0.50	**0.64**	0.21
Disorderliness	-0.03	-0.05	-0.27	**0.76**
Extravagance	-0.05	0.14	0.20	**0.60**
Exploratory Excitability	0.22	0.03	0.30	**0.59**
Impulsiveness	-0.26	-0.23	0.03	**0.55**
Explained variance (%)	25.76	16.45	12.99	6.77

Rotation Method: Promax with Kaiser Normalization.

Loadings with absolute values >=0.55 are shown in bold.

Table 7
Principal Component Analysis of Character Facets

	Factor 1 C	Factor 2 SD	Factor 3 ST
Compassion	**0.81**	-0.04	0.03
Helpfulness	**0.80**	-0.09	0.05
Social Acceptance	**0.71**	0.00	-0.06
Pure-Hearted Conscience	**0.53**	0.04	0.12
Empathy	**0.53**	0.02	0.24
Self-Acceptance	**0.39**	0.26	-0.30
Purposefulness	-0.15	**0.89**	0.25
Resourcefulness	-0.03	**0.86**	0.04
Enlightened Second Nature	-0.01	**0.81**	-0.06
Responsibility	0.21	**0.64**	-0.23
Transpersonal Identification	0.18	0.05	**0.83**
Self-Forgetful	-0.12	0.06	**0.83**
Spiritual Acceptance	0.16	-0.06	**0.75**
Explained variance (%)	27.4	17.72	12.74

Rotation Method: Promax with Kaiser Normalization.

Loadings with absolute values >=0.39 are shown in bold.

Table 8

Means, Standard Deviations, and Cronbach's Alpha of Temperament Scales

	No. of items	Mean ± SD	α
Novelty Seeking	**35**	**109.0 ± 14.8**	**.83**
Exploratory Excitability	10	34.7 ± 4.7	.64
Impulsiveness	9	25.4 ± 6.1	.80
Extravagance	9	27.5 ± 6.6	.83
Disorderliness	7	21.4 ± 4.2	.52
Harm Avoidance	**33**	**84.5 ± 18.9**	**.91**
Anticipatory Worry	11	27.7 ± 7.3	.84
Fear of Uncertainty	7	19.6 ± 5.4	.78
Shyness	7	18.0 ± 6.2	.88
Fatigability	8	19.3 ± 5.5	.81
Reward Dependence	**30**	**104.7 ± 15.2**	**.87**
Sentimentality	8	27.4 ± 4.9	.70
Openness to Warm Communication	10	36.2 ± 6.5	.81
Attachment	6	20.5 ± 4.9	.80
Dependence	6	20.5 ± 3.6	.61
Persistence	**35**	**127.2 ± 16.7**	**.90**
Eagerness of Effort	9	30.8 ± 5.4	.76
Work Hardiness	8	29.9 ± 4.3	.72
Ambitiousness	10	37.9 ± 5.3	.77
Perfectionism	8	28.5 ± 5.3	.77

Table 9

Means, Standard Deviations, and Cronbach's Alpha of Character Scales

	No. of items	Mean ± SD	α
Self-Directedness	**40**	**141.5 ± 19.0**	**.90**
Responsibility	8	31.8 ± 4.7	.78
Purposefulness	6	22.3 ± 4.4	.79
Resourcefulness	5	19.2 ± 3.1	.66
Self-Acceptance	10	28.5 ± 7.1	.78
Enlightened Second Nature	11	39.7 ± 6.8	.83
Cooperativeness	**36**	**138.1 ± 14.8**	**.86**
Social Acceptance	8	31.1 ± 4.5	.79
Empathy	5	18.5 ± 3.0	.62
Helpfulness	8	31.4 ± 3.6	.61
Compassion	7	25.8 ± 5.7	.85
Pure-hearted Conscience	8	31.3 ± 4.3	.56
Self-Transcendence	**26**	**74.8 ± 16.3**	**.89**
Self-Forgetfulness	10	30.3 ± 6.3	.74
Transpersonal Identification	8	21.4 ± 5.8	.78
Spiritual Acceptance	8	23.1 ± 7.9	.88

Table 10

Personality Differences Between MBA Students and US Age Stratum 22-35

Temperament Scales		Mean Difference	*t*	*p*
NS	Novelty Seeking	4.99	9.931	<.001
HA	Harm Avoidance	-4.46	-9.453	<.001
RD	Reward Dependence	1.89	3.673	<.001
PS	Persistence	0.65	1.473	.14

Mean differences are expressed in T scores units (M=50, SD=10)

Character Scales		Mean Difference	*t*	*p*
SD	Self-Directedness	0.73	1.625	.105
C	Cooperativeness	2.06	4.373	<.001
ST	Self-Transcendence	0.534	0.967	.334

Mean differences are expressed in T scores units (M=50, SD=10)