Biological vs. Social Construction of Personality

A Fictitious Five-Factor Analysis among Inuit Children

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Introduction

Stable concepts of personality arise from biological, cognitive and social factors with differing implications on their universality. This study investigates biological and social influences on personality in Canadian Inuit children.

The five-factor model (FFM) is considered the gold standard in describing personality, forming a widely accepted taxonomy of individual trait concepts. The FFM clusters openness, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN). Based on lexical analysis, the FFM provides a common ground for statistical methods and personality description. McCrae & Costa (1987) validated the FFM across observers and instruments in Western, educated, industrialized, rich and democratic (WEIRD) societies (p. 85-89). Other approaches are often discussed as subsets, extensions or generalizations on the FFM. Eysenck's two-factor dimensions are part of OCEAN. Digman's two-factor model combines OCEAN into the meta-traits alpha (stability) and beta (plasticity; DeYoung, & Peterson, 2007, p. 881). The newer HEXACO model separates intelligence from personality and distinguishes between emotional and volatile aspects (Ashton, Lee, de Vries, 2014, p. 139-142).

Contrary to the proprietary nature of McCrae and Costa's NEO personality inventory, the Goldberg International Personality Item Pool (IPIP, 2017) offers a free alternative. The IPIP contains 3,320 items clustered into 274 constructs that have been correlated with most commonly used trait inventories. OCEAN classification and scoring keys are available. Convergent and discriminant validity of the IPIP against the NEO-FFI have been shown by Lim & Ployhart (2006, p. 37-51). The considerable number of items supports translation to languages with limited personality vocabulary. Thus, the IPIP appears suitable to construct a questionnaire to use with Inuit children. No translation to Inuktitut is currently available.

Emotions as a Link between Biological and Social Factors

Human biology varies little across cultures. Early biological theories for personality have been proposed by Eysenck (1967) and Gray (1995, pp. 1160-1172). Despite the criticism of these behaviorist approaches, cognitive neurosciences found support for OCEAN traits in attentional, motivational and emotional circuits.

Speed et al. (2015) confirmed a positive association between extraversion and the late positive potential. Extraversion has shown to correlate with late potential activation in emotion regulation, overruling male to female differences (Cai, Lou, Long, & Yuan, 2016, p. 5). Selective serotonin reuptake inhibitors influenced both emotional stability and extraversion (Ilieva, 2015, p. 129). Conscientiousness has been connected to disgust vulnerability (Inchausti, Delgado, & Prieto, 2015, p. 254-255). Agreeableness varies with the speed of emotion attribution decisions (Haas et al., 2015). The presence of mixed emotions supports openness and the volatility of neuroticism (Barford, & Smillie, 2016, p. 118-122).

Social anxiety has been negatively correlated with self-efficacy (conscientiousness) and trust (agreeableness; Kaplan et al., p. 212-222). The cross-cultural validity of emotions and their facial expressions has been popularized by Ekman & Friesen (1971). The common role of emotion in both the cognitive neurosciences and the FFM strongly suggests cross-cultural validity of the emotional aspects of OCEAN traits. Although biological mechanisms contribute to more than one trait, the FFM has not been robustly falsified.

Cross-Cultural Validity of the Lexical Approach

OCEAN traits have been verified across WEIRD societies. However, not all traits appear to be similarly evident in all cultures. Diligence is required when translating inventories. Mlacic & Goldberg (2007) confirmed OCEAN traits using a Croatian translation (N = 519). Lim, & Melissa Ng Abdullah (2012) established the validity of the FFM in a

sample of Malaysian students (N = 360). Both studies used double-back translation by speakers proficient in both languages with subsequent refinement, hinting at subtle differences in the verbal construction of personality concepts.

Verbal constructions of personality depend on the prevailing epistemology. Different epistemological types are stable across cultures, but the dominant type may vary between cultures. Verbal descriptions of traits thus need relevance within-culture or denote relevant differences between cultures (Maruyama, 1999, pp. 53-60). For example, cooperative societies of Asia may rely more on agreeableness than individualistic Western societies, making agreeableness a relevant within-culture and between-culture trait. McCrae et al. (2004) established cross-observer validity of the NEO-PI-R (p. 196-198). Spouse ratings were found to be superior to judgments of more distant raters, supporting the cultural constructivist hypothesis.

The Five-Factor-Model and Indigenous Peoples

In contrast to the majority of WEIRD study participants, indigenous populations are often largely illiterate. Cultural trajectories influence the verbalization of personality. Gurven et al. (2013) conducted the first extensive indigenous study of the FFM (N = 632) among the Tsimane forager-farmers of Bolivia and failed to replicate the FFM. The Tsimane culture appeared to base personality on industriousness and pro-sociality while organizing subsistence. Indigenous family patterns differ, which may impact concepts of personality. The Inuit, for example, promote bilateral family structures, giving equal recognition to maternal and paternal kinship, and frame the social domain as an extended, outer family (Mead, 1932, p. 26).

Inuktitut is made up of a variety of local dialects, making it difficult to translate to "the" Inuktitut language. Most Inuit in Canada speak English as a second language, are schooled and integrated into the Canadian society. Thus, "the Inuit are now modern people,

and like almost everyone else in the world, no longer live the way their ancestors did" (Morrison, 2016, 316-318). Traditionally, the Inuit valued sharing, cooperation, and non-conflict and cultivated high control over negative, social emotions. Moving from subsistence to a cash-based economy uprooted traditional family structures and created a WEIRD-alike, Pareto-distribution of wealth. It is therefore questionable to what degree Inuit children may still be considered indigenous (Knaurs, & Hund, 2015, pp. 69-75).

Inuktitut is a language of the Eskimo-Aleut family with 21,300 dictionary entries, 1,816 (9%) of which are related to human attributes. A lexical analysis, comparing twelve mutually isolated languages including Inuktitut, extracted several common concepts for personality. None of them clustered to the FFM. In difference to other indigenous languages, Inuktitut showed no concepts for "crooked" and "right" when used on persons (Saucier, Thalmayer, & Bel-Bahar, 2014, pp. 199-211). An analysis against n-factor approaches suggested that big-two are well-identifiable within these isolated languages, but that "three- to six-factor models […] draw on culturally specific contents of contemporary complex societies" (ibid., p. 210).

To further differentiate between biological and social construction of personality, this study uses a 25-item questionnaire testing Inuit children from 9-12 years in the Inuktitut language. Given the age of the participants and the cultural bias of Inuktitut, it is expected that biologically rooted emotional aspects cluster similar to their respective OCEAN counterparts (openness, extraversion, neuroticism). Conscientiousness and agreeableness are expected to correlate weakly, assuming the non-universal nature of their social construction.

Method

Participants

To measure the applicability of the Five-Factor-Model in a population of Inuit children from Canada in the Inuktitut language, a sample of primary and secondary school students was recruited. A total of 1006 individuals (N=1006) participated in the study. The children were studying in Years 4-7 at ten high schools in the Nunavut region in Canada. Participants were between 9 and 12 years old (M = 10.8, SD=0.65), with 498 boys and 514 girls in the sample. All children were native speakers of the Inuit language, and spoke English as a second language. The sample was not subdivided into age groups. Children were not assessed for English language skills. The final datasets were anonymized and did not contain information with regard to age or gender.

Design

The study was setup as exploratory factor analysis. Twenty-five variables were rated on 5-point Likert scale by participants in single sessions. The interviews were conducted as standalone measures and not related to other scientific experiments. The study was not controlled for other participant-related, social variables that may bias the results towards the general Canadian population, for example, percentage of Inuit population in the respective classes, close friends, or other, social engagement. Participants were tested on one single occasion for each participating school, non-showing children were discarded from the list of participants. After data had been collected from all participating schools, parallel analysis with principal component analysis was used on the obtained dataset to identify the number of contained factors. Subsequently, factor analysis with oblimin rotation was performed to find a final version of the model. Clusters were then verified against the Five-Factor-Model traits Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN).

Materials

A 25-item self-report questionnaire has been constructed, measuring the Big-Five personality traits Openness (O1-O5, items V3, V9, V10, V21, V23), Conscientiousness (C1-C5, items V2, V13, V17, V19, V22), Extraversion (E1-E5, items V4, V6, V14, V20, V25), Agreeableness (A1-A5, items V1, V7, V12, V16, V18), and Neuroticism (N1-N5, items V4, V8, V11, V15, V24). All items were drawn from the International Personality Item Pool (IPIP, n.d.), selecting items for Goldberg's (1992) Big-Five Factor Markers. Five items were selected from Goldberg's 20-item scales for each trait. Particular care was taken to select statements that are easily comprehensible for 9-12 year-old children. It was also avoided to draw duplicates that measure the same sub-trait within the items for each trait. Items with concrete questions have been preferred over abstract wording (cf. Mellor, & Moore, 2014). For example, preference was given to "I like being with people" over "I feel comfortable around people", or "I love to help others" over "I take time out for others".

Few of the items (3 of 25) were negatively keyed, but negative keying was kept at a minimum. Marsh (1986) suggests that younger children find interpretation more difficult when questions are negatively keyed, particularly when they have limited verbal abilities. An Inuktitut version of the items was not available at the time of the study from the IPIP pool. Therefore, all items were translated by a panel of three professional translators that were proficient in both English and Inuktitut. All questions were subsequently translated back to the English language by different translators (double-back translation). The resulting questionnaire was tested on 20 students in one-on-one sessions. Two items were replaced and adjustments were made to four other item translations.

Procedure

Participants were recruited from 12 primary and secondary schools in the Nunavut region. Principles of 10 out of 12 contacted Nunavut primary and secondary schools gave

permission to carry out the study in their schools. To sample the subjects, school principals authorized information letters that were sent to legal guardians' homes. The letters invited both guardians and their children to participate in a study about "Social and Biological Contributions to Personality". Permission was asked of students and guardians prior to the study using informed consent forms. After the study, both children and guardians have been briefed on the study results via mail, including an evaluation of the guardians' study as an added incentive. The initial invitation encouraged 85-126 participants from each of the ten schools, with valid datasets obtained from 1006 children overall at the end of the data collection (N=1006). Datasets were collected between 8 October, 2016 and 02 February 2017. As part of the information letters, all children and guardians obtained written information explaining both nature and purpose of the study. The questionnaire was completed at school during classroom sessions by the children. Guardians were invited to fill additional questionnaires at the same time in separate rooms. Both research assistant and pedagogue were present during the children's sessions. Special care was taken to obtain private and independent responses. Additionally, the project has been approved by the University of Liverpool Committee on Research Ethics (CORE).

A frequency-based scale ranging from "never" to "always" was selected to be suitable for children between 9 and 12 years, but was advised against by both panel of expert translators and exploratory tests (Mellor, & Moore, 2014). In the final questionnaire, items had to be scored on a 5-point Likert-scale using value judgments with 1 = "strongly disagree," 2 = "disagree," 3 = "neutral," 4 = "agree," 5 = "strongly agree." The order of the items has been randomized before setting up the questionnaires. Further, manual refinement was used to make sure that not more than two items measuring the same factor are presented consecutively. The items were presented to all participants using the same questionnaire in the

same order. Additionally, parents have been invited to fill the questionnaire, but results are not included in this report.

Results

To examine the applicability of the Five-Factor-Model OCEAN traits in a population of Inuit children speaking Inuktitut, questionnaires with 5 items for each trait (V1-V25) were rated on a Likert-scale from 1-5 by 1006 children (N = 1006).

Data Screening

The sample (N=1006) satisfied the minimum size for factor analysis. No univariate outliers have been found in the data. There were no out-of-range values, and no missing values were identified. Data was normally distributed with negative Kurtosis [-.409; -.667]. Items E1-E5 that were hypothesized to correlate with extraversion, showed the smallest variance (8.88). Items selected to correlate with openness had the biggest variance (12.88).

Table 1
Descriptive statistics for the un-factored responses

Variable (Sum)	M	Range	SD	Skewness	Kurtosis
A1-A5	15.00	6-25	3.47	.030	-.469
C1-C5	14.99	7-23	3.25	-.024	-.667
O1-O5	14.96	5-24	3.59	-.038	-.567
E1-E5	14.99	7-23	2.98	-.006	-.409
N1-N5	14.16	6-23	3.13	-.232	-.430

Factor Analysis

Initially, parallel analysis was performed using Parallel Analysis Engine (Patil et al. 2007). Exploratory principal component analysis with IBM SPSS version 21.0 without factor rotation was performed to determine the factorability of the 25 variables. 500 matrices have been calculated to extract boundary eigenvalues for parallel analysis. Subsequently, five

factors were extracted based on eigenvalues greater than their random counterparts (F1 = 2.16, F2 = 2.11, F3 = 1.89, F4 = 1.70, F5 = 1.62). A sixth factor, which was just above the 1.0-threshold (1.06), has been dropped, as it was found to be below the eigenvalue found by parallel analysis (1.16). Bartlett's test of sphericity was significant $(X^2(300) = 2152.77, p <$ .001). Kaiser-Meyer-Olkin Measure of sampling adequacy was .70, exceeding the recommended value of .6. Communalities after principal extraction were all above .29, thus all variables have initially been retained. In the principal component analysis, the first factor explained 8.64% of the variance, the fifth factor 6.77%. The five extracted factors together explained 38.10% of the variance. Subsequent factor analysis was performed using five factors and oblimin rotation to find the final solution. Because it failed to produce a factor loading on any factor of at least .3, variable V9 (O2) was excluded from the rotated solution. All remaining items produced factor loadings in the rotated model space of above .39. No items of the rotated solution cross-loaded above .2.

All except one of the remaining variables had their highest loading in their assumed clusters with regard to the Big Five factors they were selected for. As an exception, V16 (A4) loaded with N1-N5 (Neuroticism) instead of A1, A2, A3 and A5 (Agreeableness). Therefore, the extracted factors were comparable in size, with F1 (5 variables, 21%), F2 (6 variables, 25%), F3 (5 variables, 21%), F4 (4 variables, 17%), and F5 (4 variables, 17%). Likewise, the value of the congruence coefficients was comparable between the five factors. The absolute maximum factor loading for the best-factoring variable ranged from .52 (F2, V8) to .56 (F4, V10). The minimum loadings ranged from .39 (F3, V4) to .51 (F1, V17). The variables that were selected from the neuroticism axis of the inventory showed the highest mean congruence coefficient with the smallest standard deviation (F1). The absolute values of the congruence coefficients ranged from .51 to .54 for F1 (M = .52, SD=.011), from .41 to .52 for F2 (M = .47, SD=.039), from .39 to .53 for F3 (M = .46, SD=.058), from .42 to .56 for F4 (M = .51, SD=.054), and from .41 to .54 for F5 (M = .47, SD=.048).

Table 2

Factor loadings based on principal axis factoring and oblimin rotation and Kaiser normalisation for the remaining 24 items

Variable	F1	F2	F3	F4	F5
V19 (C4)	.54				
V2 (C1)	.52				
V22 (C5)	.52				
V13 (C2)	-.51				
V17 (C3)	.51				
V8 (N2)		.52			
V16 (A4)		.50			
V11 (N3)		.49			
V24 (N5)		.48			
V5 (N1)		.43			
V15 (N4)		-.41			
V25 (E5)			.53		
V6 (E2)			-.52		
V14 (E3)			.47		
V20 (E4)			.40		
V4 (E1)			.39		
V10 (O3)				.56	
V3 (O1)				.54	
V23 (O5)				.51	
V21 (O4)				.42	
V18 (A5)					.54
V1 (A1)					.49
V7 (A2)					.45
V12 (A3)					.41

For each of the five extracted factors, composite scores were calculated. Skewness indicates normal distribution of the values with negative kurtosis within acceptable range.

Pairwise correlation tests did not indicate Pearson correlations above $r = .03$, no significant correlation coefficient has been found for $p < .05$. Although the congruence coefficients were moderate in size, the rotated factors show no significant correlation. Thus, the found model appears to be a valid solution with regard to the obtained data.

Table 3

Descriptive statistics for the final factored responses

Factor (Items)	M	Range	SD	Skewness	Kurtosis
F1 (5)	14.99	7-23	3.23	-.05	-.67
F2 (6)	17.13	7-28	3.71	.21	-.46
F3 (5)	14.99	7-23	2.98	-.01	-.41
F4 (4)	12.04	4-20	3.41	-.02	-.61
F5 (4)	12.04	4-20	3.24	-.01	-.60

Discussion

The aim of the present study was to test the Five-Factor-Model against a formerly indigenous population of Inuit speaking the Inuktitut language. School children from 9 to 12 years of age of the Nunavut region in Canada completed 25-item personality questionnaires. The items were drawn from the IPIP pool (Goldberg's Big Five Factor Markers), and particularly selected and translated for children. The results indicated a clear structure of five factors explaining 39.61% of the variance. Factor loadings ranged from .39 to .56, only one loading was below .4. Given a sample size of 1006 children, all factor loadings could be considered substantial. Following Stevens (2002), for a sample size of 1000 participants, factor loadings above .162 may be considered significant. No significant cross-loadings above .162 have been found in the rotated model.

Although a cumulative variance of 39.61 can be generally considered low, the proportion of variance explained is above prior findings for self-reports for the Big Five Questionnaire for Children (BFQ-C). Many natural sciences aim for 90% or above in the final model, social sciences often for about 60%. Barbaranelli et al. (2003) report five factors accounting for 30.2% of the variance for elementary school children, and 39.1% for adolescents. For students aged from 12 to 17 years, Muris, Meesters, & Diederen (2005) report five factors accounting for 36.38% of the total variance. In both studies, self-reports of children generally scored lower than parent or teacher reports. For self-reports of children from 9 to 12 years using a translated 25-item questionnaire based on Goldberg's Big-Five factor markers, 39.61% of the variance explained can thus be considered a very good result.

It was hypothesized that factors can be extracted for emotional aspects of personality that are rooted in biology, particularly openness, extraversion, and neuroticism. This part of the hypothesis can be accepted. All three factors can be found in the model, with all items of neuroticism and extraversion loading on their respective OCEAN factors. One item related to agreeableness loaded on neuroticism. As an explanation, it may be assumed that the phrase "I

have a soft heart" was attributed by the children to their own internal state rather than taken as description of their relationship to their peers, causing the misplaced loading.

As a second hypothesis, it was expected that conscientiousness and agreeableness will not factor or factor only weakly. It was assumed that the social construction underlying conscientiousness and agreeableness is non-universal in nature. This hypothesis can be rejected. Neuroticism and agreeableness clearly clustered into similarly distinct factors. In contrast to the hypothesis, neuroticism exhibited the highest median and average factor loadings in the examined sample (M = .52, SD = .01, Median = .52). Agreeableness clustered similar to extraversion, openness, and neuroticism, with the above-described one agreeableness item loading onto neuroticism. No culture or language specific factor loadings (or absence thereof) could be found.

Inuit are No Longer Indigenous

Contrasting Gurven et al.'s (2013) study among Tsimane forage-farmers in Bolivia, all five OCEAN factors have been found in the present study. It can thus be assumed that there is a substantial difference between the indigenous society of Tsimane and the present Inuit sample. While family patterns of both indigenous populations differed from those of WEIRD societies in the past, the factored results suggest that the Inuit can no longer be considered an indigenous population. This assumption is backed up by several other observations. Knaurs, & Hund (2015) emphasized the modern structure of the Inuit people and their integration within the Canadian society, with particular focus on the shared schooling system. Additionally, English is widely spoken by Inuit as a second language (cf. also Morrison, 2006). The higher loadings on conscientiousness may indicate remnants of a prior, subsistence-based organization of society, but can likewise be explained by living at the lower end of a meritocracy with Pareto-distribution of wealth. In this particular life-situation, conscientiousness has shown to be a strong predictor of income and standard of living. It can

thus be assumed, that today the Inuit perspective on personality corresponds to that of the general Canadian society, with the particular problems of remote, rural regions, for example, unemployment and poverty.

Although Saucier, Thalmayer, & Bel-Bahar (2014) found no evidence for the FFM in a dictionary analysis of the Inuktitut language, the present study found a clear five factor solution for translated items self-rated by 9-12 year-old school children. It is therefore suggested, following the bilingual education of many Inuit, that modern Inuktitut acquired phrases for a variety of concepts that are available in English. It is safe to assume that the remaining, problematic items have been discarded by the preliminary test of the questionnaire with prior double-back translation. From an epistemological perspective, it appears conclusive that schooling in the English language reflects back on individual thought patterns adding to concepts that are derived from Inuktitut.

Methodological Considerations

Lacking a pre-tested translation of the IPIP items, own translations had to be found and tested. Although a panel of three translators and double-back translation was used, the preliminary sample of 20 students cannot be considered a hard test for the developed questionnaire. Translations of a source questionnaire that is particularly aimed at children, for example, the BFQ-C, may provide better comparability of the factor loadings and percentage of explained variance in the model, providing reference values for other languages and societies (Barbarelli, Caprara, & Rabasca, 1998). It was surprising to find explained percentages of variance for the five factors in the present study that are higher than those reported by Barbarelli et al. (2003) and Muris, Meesters, & Diederen (2005). The surplus may be owing to the selection, particular phrasing, and translation of the questionnaire's IPIP items. From an epistemological point of view, an interpretation of personality in terms of

authority may be overemphasized in a particularly poor part of Canadian society, and an authoritarian bias may be present in the simple phrasing of the selected FFM items.

The present study did not control for other, social variables that may influence concepts of personality or measure the degree of integration of individual Inuit children into the Canadian society, for example, number of friends with English as primary language, leisure activities, and family contexts. It can be assumed that the degree of integration correlates with the strength of the loadings of the items on the five factors. The study was also not controlled for gender-specific effects. Likewise, no age-based categories were formed to verify an age-related progression of the percentage of explained variance. Ratings by teachers and parents may be examined, that usually score higher in terms of explained variance. It remains questionable, whether the findings with children are replicable among the elder members of the Canadian Inuit population. Following Mead's (1932) descriptions, indigenous family patterns could still be found in the Inuit population in the first half of the 20th century. It can be hypothesized that traces of these patterns will still show when the same children, for example, are rated by their most senior family members in the Inuktitut language, with the time window for this examination closing rapidly.

From WEIRD Societies to the Indigenous or Vice Versa

The present study took items from the IPIP pool that had been established to measure the Five-Factor-Model of personality in WEIRD societies. They were subsequently translated to Inuktitut and failed to measure particularly indigenous factors of personality, showing clear five-factor OCEAN dimensions. Although there was concern that Inuktitut may lack proper terms to convey the exact meaning of the English items, it may also be true that the English language lacks the proper vocabulary to test for particularities of indigenous aspects of Inuit culture. Any lexical test instrument remains confined to the semantics of the items it provides. Any concepts that lie beyond its epistemological context remain as second order ignorance

seen from within (one does not know which significant items are missing). A similar argument was led between Paul Ekman and Lisa Feldman Barrett with regard to emotion research. Ekman tried to show the universality of emotions by having indigenous populations sort pictures displaying facial emotions into stacks that were labeled with terms for the six basic emotions happiness, sadness, fear, disgust, anger, and surprise. Ekman's experiments provided evidence that these facial expressions were universally present across many populations. By removing the words from the experiment, Feldman Barret found that members of the same indigenous societies will group these pictures together differently when predefined labels are missing, suggesting a different, underlying factorial structure of emotion expression (cf. Fischer, 2013). From a lexical point of view, it can be assumed that Ekman tested the ability to associate predefined terms with particular facial expressions rather than the universality of emotion expression. The Inuit sample in the present study may yield different factors when using a test that was particularly constructed in terms of the Inuktitut language, remains confined to concepts of the Inuit culture, and provides coverage of aspects of personality that is equally dense. Future research may separate between universal models originating in WEIRD societies and indigenous concepts of personality. Particularly, research may focus on how and to what degree indigenous factors load on their universal counterparts (cf. Valchev et al., 2014).

Given the normalizing trend of ever more global, modern-day communication technologies, future investigations may specifically address the remaining pre-literate or less educated societies rather than the well-educated sample of Inuit school children used in this study. Studies may also focus on how genes and inheritance interact with culture and modulate the construction of personality within people's cultural context (cf. Church, 2016).

Conclusion

Rejecting the initial hypothesis, all five OCEAN traits were clearly found in a sample of Inuit children self-rating a 25-item IPIP questionnaire in the Inuktitut language. In contradiction to prior indigenous studies and a dictionary analysis of Inuktitut, the study did not reveal subsistence-based or other indigenous patterns of personality; neither did language limitations inhibit any of the Big-Five factors from clustering. The present study therefore provides strong support for the applicability of the Five-Factor-Model to the examined sample of Inuit children. The present results support the integrative hypothesis that considers particularly younger Inuit as culturally adapted members of the general Canadian society. It therefore remains unclear what implications can be made on the universality of the FFM with regard to indigenous societies. The comprehensive cultural integration of the Inuit into the framing WEIRD society context of the measurement instrument overshadows indigenous particulars.

References

Ashton, M. C., Lee, K., & de Vries, R. E. (2014). The HEXACO Honesty-Humility, Agreeableness, and Emotionality Factors: A review of research and theory. *Personality and Social Psychology Review, 18*, 139-152.

Barbaranelli, C., Caprara, G. V., & Rabasca, A. (1998). *Manuale del BFQ-C. Big Five Questionnaire Children*. Firenze, Italy: O.S. Organizazioni Speciali.

Barbaranelli, C., Caprara, G. V., Rabasca, A., & Pastorelli, C. (2003). A questionnaire for measuring the big five in late childhood. *Personality and Individual Differences, 34*, 645-664. doi:10.1016/S0191-8869(02)00051-X

Barford, K. A., & Smillie, L. D. (2016). Openness and other Big Five traits in relation to dispositional mixed emotions. *Personality and Individual Differences, 102*(2016), 118-122.

Cai, A., Lou, Y., Long, Q., & Yuan, J. (2016). The sex differences in regulating unpleasant emotion by expressive suppression: Extraversion matters. Frontiers In *Psychology, 7*(JUL), doi:10.3389/fpsyg.2016.01011

Church, A. T. (2016). Personality traits across cultures. *Current Opinion in Psychology, 8*, 22-30.

Costa, P. T., & McCrae, R. R. (1992). *NEO-PI(R) professional manual*. Odessa, FL: Psychological Assessment Resources

DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology, 93*, 880-896.

du Plessis, G. A., & de Bruin, G. P. (2015). Using Rasch modelling to examine the international personality item pool (IPIP) values in action (VIA) measure of character strengths. *Journal of Psychology in Africa, 25*, 512-521.

Ekman, P. E., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17*(2), 124-129.

Eysenck, H. J. (1967). *The biological basis of personality*. Springfiled, IL: Charles C.

Thomas.

Fischer, S. (2013). About face: Emotions and facial expressions may not be related. *Boston*

Magazine, 6(2013). Retrieved March 08, 2017 from

http://www.bostonmagazine.com/news/article/2013/06/25/emotions-facial-

expressions-not-related/

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure.

Psychological Assessment, 4(1), 26-42.

Gray, J. A. (1995). A model of the limbic system and basal ganglia: Applications to

anxiety and schizophrenia. In M. S. Gazzaniga (Ed.), T*he*

cognitive neurosciences (pp. 1165-1176). Cambridge, MA: MIT Press.

Gurven, M., Von Rueden, C., Massenkoff, M., Kaplan, H., & Vie, M. L. (2012). How

universal ist he Big Five? Testing the five-factor model of personality among forage-

farmers in the bolivian amazon. *Journal of Personality and Social Psychology, 104*(2),

354-370.

Hirsh, J., & Peterson, J. (2009). Personality and language use in self-narratives. *Journal Of*

Research In Personality, 43(3), 524-527.

Ilieva, I. (2015). Enhancement of healthy personality through psychiatric medication: The

influence of SSRIs on Neuroticism and Extraversion. *Neuroethics, 8*(2), 127-137.

doi:10.1007/s12152-014-9226-z

Inchausti, F., Delgado, A. R., & Prieto, G. (2015). Obsessive-compulsive disorder and its

relationship with disgust vulnerability and conscientiousness. *Psicothema, 27*(3), 254-

260.

International Personality Item Pool [IPIP]. (2017). *A Scientific Collaboratory for the*

Development of Advanced Measures of Personality and Other Individual Differences.

Retrieved January 31, 2017 from http://ipip.ori.org/

Kaplan, S. C., Levinson, Ch. A., Rodebaugh, T. L., Menatti, A., & Weeks, J. W. (2015). Social anxiety and the big five personality traits: The interactive relationship of trust and openness. Cognitive *Behaviour Therapy, 44*(3), 212-222.

Knaus, K., & Hund, A. (2015). Traditional Inuit Family Structure and Values As Influenced by the Modern Economic System: Lessons about the Concept of Family as the Unifying Agent for theWellness of Culture, Community and Society. *International Journal Of Health, Wellness & Society, 5*(3), 69-81.

Lim, P. S., & Melissa Ng Abdullah, L. Y. (2012). Relationship between Big-five Personality Domains and Students' Academic Achievement. *Pertanika Journal Of Social Sciences & Humanities, 20*(4), 973-988

Marsh, H. W. (1968). Negative item bias in rating scales for pre-adolescent children. *Developmental Psychology*, 22, 37-49. doi:10.1037/0012-1649.22.1.37

Maruyama, M. (1999). Heterogram analysis: Where the assumption of normal distribution is illogical. *Human Systems Management, 18*(1999), 53-60.

McCrae, R. R. (2002). Cross-cultural research on the five-factor model of personality. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online readings in psychology and culture* (Unit 6, Chapter 1). Retrieved from http://www.wwu.edu/~culture

McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*, 81-90.

McCrae, R. R., & Costa, P. T., Jr. (1997). Personality trait structure as a human universal. *American Psychologist, 52*, 509 –516. doi:10.1037/ 0003-066X.52.5.509

McCrae, R. R., Costa, J. T., Martin, T. A., Oryol, V. E., Rukavishnikov, A. A., Senin, I. G., & ... Urbánek, T. (2004). Consensual validation of personality traits across cultures.

Journal Of Research In Personality, 38, 179-201. doi:10.1016/S0092-6566(03)00056-4

Mead, M. (1932). Contrasts and comparisons from primitive society. *Annals of the American Academy of Political and Social Science, 160*(1), 23-28.

Mellor, D., & Moore, K. A. (2014). The use of Likert scales with children. *J Pediatr Psychol*, 39(3), 369-379.

Mlacic, B., & Goldberg, L.R. (2007). An analysis of a cross-cultural personality inventory: The IPIP Big-Five factors in Croatia. Journal of Personality Assessment, 88, 168-177.

Morrison, D. (2006). Inuit culture. *Oxford Companion To Canadian History*, 316-318.

Muris, P., Meesters, C., & Diederen, R. (2005). Psychometric properties of the Big Five Questionnaire for Children (BFQ-C) in a Dutch sample of young adolescents. *Personality and Individual Differences, 38*, 1757-1769. doi:10.1016/j.paid.2004.11.018

Patil, V. H., Singh, S. N., Mishra, S., & Donovan, D. T. (2007), Parallel Analysis Engine to Aid Determining Number of Factors to Retain [Computer software]. Available from http://smishra.faculty.ku.edu/parallelengine.htm; Utility developed as part of Patil, Vivek H., Surendra N. Singh, Sanjay Mishra, and Todd Donovan (2008). Efficient Theory Development and Factor Retention Criteria: A Case for Abandoning the 'Eigenvalue Greater Than One' Criterion. *Journal of Business Research*, 61 (2), 162-170.

Saucier, G., Thalmayer, A., & Bel-Bahar, T. (2014). Human Attribute Concepts: Relative Ubiquity Across Twelve Mutually Isolated Languages. *Journal Of Personality And Social Psychology, 107*(1), 199-216.

Speed, B. C., Nelson, B. D., Perlman, G., Klein, D. N., Kotov, R., & Hajcak, G. (2015). Personality and emotional processing: A relationship between extraversion and the late positive potential in adolescence. *Psychophysiology, 52*, 1039-1047.
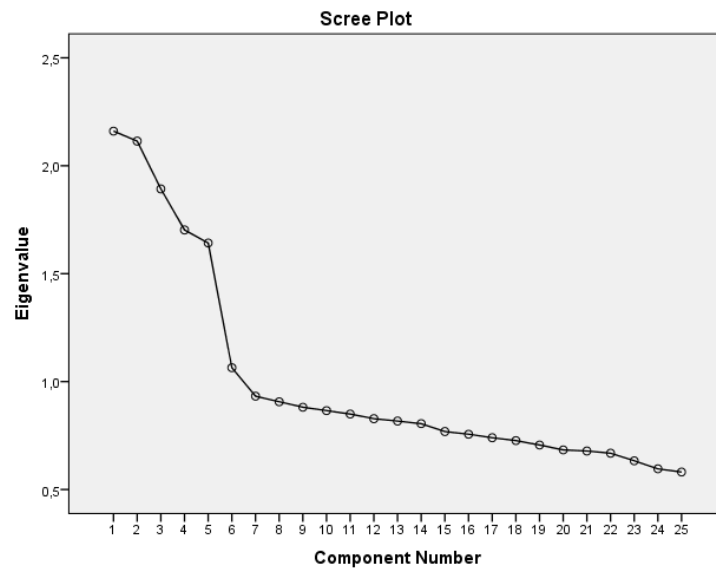
Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Hillsdale, NJ: Erlbaum.

Valchev, V. H., van de Vijver, F. J. R., Meiring, D., Nel, J. A., Hill, C., Laher, S., Adams, B. G. (2014). Beyond agreeableness: Social-relational personality concepts from an indigenous and cross-cultural perspective. *Journal of Research in Personality, 48*, 17-32.

Woods, S., & Hampson, S. (2005). Measuring the Big Five with single items using a bipolar response scale. *European Journal of Personality, 19*(5), 373–390.

Appendix A: Scree-Plots for the Factored Solutions

Principal Component Analysis (25 Variables)

Final Solution (5 Factors, 24 Variables)