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Computing Eysenck's Personality Types:
A Closer Look at the Standard Method

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Liyanage (2004) carried out a major study to investigate the relationship between personality type and choice of English as a Second Language (ESL) learning strategies for a group of 886 participants in Sri Lanka. Liyanage used the Eysenck Personality Questionnaire (EPQ) to measure personality type in that study. The manual of the EPQ (1991) indicates that participants can be assigned to four personality types (Choleric, Sanguine, Melancholic, and Phlegmatic) by comparing the total scores on two subscales (Extroversion; Neuroticism). However, in the Sri Lankan study, this total score method resulted in a gross imbalance in the assignment of participants to specific personality types. The present paper reports and compares outcomes based on the total score method with an alternative approach to computing personality type that produced more balanced outcomes. It discusses logical links between the use of these methods and the outcomes of previous investigations of the links between personality type and language learning strategies.

The importance of personality type in second language learning
There is considerable evidence to support the view that personality influences the learning of a second language (Ely, 1986; Gayle, 1981; Guiora & Acton, 1979; Hamayan, 1977; MacIntyre & Charos, 1996; Reiss, 1983; Robinson, Gabriel, & Katchan, 1994; Seda & Abramson, 1989; Strong, 1983). Personality traits such as extroversion, assertiveness, emotional stability, adventuresomeness, and conscientiousness have been shown to have significant correlations with successful language learning (Reiss, 1983). Oxford and Nyikos (1989) have found that successful language learners choose strategies to suit their personalities. Much of the published research in the area of personality variables and language learning strategies has focused primarily on the introversion and extraversion levels of learners (Busch, 1982; MacIntyre & Charos, 1996; Robinson et al., 1994; Skehan, 1989; Wilson & Lynn, 1990) as opposed to personality type. In contrast, the present study explicitly considers the role of personality type.

A number of studies have found relationships between personality types and language learning strategies (Ehrman & Oxford, 1988, 1990, 1995; Oxford & Ehrman, 1995). However, two disturbing facts can be noticed: One is the inconsistency in the conclusions reached, and the other is that the general hypothesis of a relationship between personality type and language learning strategies is not commonly agreed upon. The literature in the area suggests that the methodologies adopted in investigating the associations and finding obtained in certain studies account for these. For instance, Ehrman and Oxford (1988, 1990) conducted two studies to examine the choice of
language learning strategies in relation to sex differences, career choice, cognitive style, and aspects of personality at the Foreign Service Institute (FSI) in America. The first study (Ehrman & Oxford, 1988) comprised a larger sample, and the second study (Ehrman & Oxford, 1990) comprised a subset of subjects from the first study. Quantitative procedures were used with the first study and qualitative procedures for data analysis were used with the second study. The reports of the two studies indicate significant discrepancies in the conclusions.

The hypothesis of a relationship between personality type and general learning strategies was investigated by Conti and Kolody (1999) for a group of adults from a range of different professional and educational backgrounds. However, the relationship between the overall personality type and the learning strategy preferences for the sample selected in their study was not significant.

These findings challenged the hypothesis of a significant relationship between learning strategies and personality, and it is this challenge that provides a sufficient rationale for the current investigation. The present study comments on a procedural issue related to the method used to compute personality type that might affect the problematic association between personality type and learning strategies.

**Method**

A representative sample of students (N = 948) learning English as a Second Language (ESL) in Government schools (N = 6) in Colombo, Sri Lanka comprised the participants for the study. These schools operated under a Ministry of Education in the Sri Lankan government. The sample comprised the three dominant subcultures in the country as demarcated by their ethnicity, language and religion: Sinhalese (N = 317), Tamil (N = 316) and Muslim (N = 315). Approximately an equal number of males and females came from each group: Sinhalese (M = 158; F = 159), Tamil (M = 156; F = 160) and Muslim (M = 156; F = 159).

The present study utilised THE Eysenck Personality Questionnaire (EPQ) as one of two major instruments: The other was the Language Learning Strategy Inventory (LLSI). The EPQ used in this research study is the Sinhala translation (Perera & Eysenck, 1984) of the 101-item version of the EPQ (H. J. Eysenck & Eysenck, 1975). The instrument measures three dimensions of a person's personality: Extroversion (E), Neuroticism (N) or emotionality, and Psychoticism (P) or tough-mindedness. It also has a lie scale (L). Extraversion and Neuroticism categories are not correlated with each other. With two, two-dimensional categories (HE/LE & HN/LN) four different personality types can be distinguished: People with high scores on both scales (HN/HE) Unstable Extravert, low neuroticism and high Extroversion scores (LN/HE) Stable Extravert, high neuroticism scores and low Extroversion scales (HN/LE) Unstable Introvert, and low scores on both scales (LN/LE) Stable Introvert. These four dimensions of personality can be identified remarkably well with the four personality types identified by the ancient Greeks and Romans: Choleric (unstable extravert), Sanguine (stable extravert), Melancholic (unstable introvert), and Phlegmatic (stable introvert) according to the Eysencks (H. J. Eysenck & Eysenck, 1985, 1991; Fontana, 1995).
The EPQ has been translated into many languages, and its cross cultural validity has long been established. Some examples include Hong Kong (S. B. G. Eysenck & Chan, 1982), Japan (Iwawaki, Eysenck, & Eysenck, 1977) and Yugoslavia (Lojk, Eysenck, & Eysenck, 1979). It was translated into Sinhala and used successfully in two studies (Perera, 1988; Perera & Eysenck, 1984). Hence, its validity as a personality assessment tool has already been established in the sociocultural context of Sri Lanka.

The study conducted in Sri Lanka employed the EPQ for personality assessment for the following reasons. The application of personality assessment tools that was developed in and for a particular cultural context to measure personality in other cultural contexts is problematic (Paunonen & Ashton, 1998). The constructs measured in such tests may not yield the same results in a different context or the constructs may not be generalised across cultures (Ben Porath, 1990). The difficulty of translation could also add to such concerns (Perera & Eysenck, 1984).

The Sinhala version of the EPQ was used with the Sinhalese group whose first language (L1) is Sinhala. A combination of the English and Sinhala versions was used to produce a Tamil language translation for Tamil and Muslim groups for whom Tamil was the first language.
Determining personality type

While the manual of the EPQ (1991) provides scoring keys based on the use of total scores, two types of analysis are possible when allocating participants to personality type categories (Perera & Eysenck, 1984). The easier method is to use total scores for extroversion and neuroticism and to assign participants to categories based on whether their scores are less than or more than 10 for extroversion (20 is the total score for Extroversion) and 11.5 for neuroticism (23 is the total score for neuroticism). Initially, this study used item scores to extract the four personality types.

A slightly more complex alternative (in that it requires additional computational resources) considered by Perera and Eysenck (1984) in relation to Sri Lankan participants, was to use factor scores for extroversion and neuroticism and, by implication, to assign participants to personality types based on whether their scores were less than or exceeded 0 ($M = 0$, $SD = 1$) for both extroversion and neuroticism. Perera and Eysenck preferred the total score method for reasons relating to computational ease, but they stated that they did not expect major discrepancies in the outcomes related to the choice of one of these two methods.

Table 1 presents results obtained from these two methods (item total scores and factor scores) in the present study. These two methods diverged significantly in terms of allocating participants to personality types. The discrepancies in distribution and exclusion were troubling and required the researcher to choose between these two methods.

As shown in Table 1, the total score method resulted in the vast majority being classified as either choleric ($N = 346$) or sanguine ($N = 350$) whereas the factor score method produced a relatively even distribution of participants to personality types. According to the factor score method, of the 886 participants, approximately 25% ($N = 226$) were classified as choleric, another 33% ($N = 292$) as sanguine, another 19% ($N = 169$) as phlegmatic, and finally, another 22% ($N = 199$) as melancholic. Also, the very low numbers of melancholic ($N = 63$) and phlegmatic ($N = 35$) participants produced by the total score method differed considerably from what might be expected.
by chance in this sample of almost 900 Sri Lankans. Insofar as the factor score method evenly distributed participants between the four personality types in this study, this method enjoys a greater measure of face validity than the total score method.

Also, as shown in Table 1, the factor score method in this study utilised the pool of participants more efficiently than did the total score method. That is, factor score computations of the two subscales allowed the authors to assign all 886 participants to personality types. In contrast, the total score method excluded 37 participants (about 4%). These 37 participants could not be allocated to personality types because their subscale scores fell on the 50% intersection point between personality types (i.e., 10 for extroversion and 11.5 for neuroticism). This problem did not arise when using the factor score method because none of the participant scores were exactly equal to zero (the midpoint when using factor scores).

Discussion and conclusions
The discrepancy highlighted in Table 1 probably has its source in the up-and-down quality of loadings between items and subscales as ascertained via exploratory factor analytic methods in this sample of almost 900 Sri Lankans. Because of the varying strength of the loadings per item, a method that weighs each item according to its contribution to the subscale (the factor score method) would produce very different scale scores to that from a method that weighs each item equivalently (the total score method). Under these conditions, the use of the factor score method produces more valid and reliable outcomes in terms of the allocation of personality types.

Importantly, the combination of the more even distribution per personality type and the use of 100% of participant responses also mean that the factor score method has the capacity to increase the reliability of significance testing in subsequent multivariate and univariate analyses investigating the relationship between personality types and language learning strategies. In contrast, one would expect statistical analyses based on computing personality type by the total score method to result in less reliable outcomes because of the dearth of participants classified as either phlegmatic or melancholic and because of the exclusion of significant numbers (in this case, 4%) of the participants. For these reasons, inferential analyses in subsequent sections of the study relied on personality type categorisations produced by the factor score method.

More generally, it could also be concluded that the inconsistent history of outcomes for previous studies examining the relationship between personality type and language learning strategies (e.g., Conti & Kolody, 1999; Ehrman & Oxford, 1988, 1990) has resulted at least in part from disproportionate and partial allocations of participants to personality type categories based on use of the total score method. In short, the superior claims to validity and reliability associated with the use of the factor score method provide strong reasons for using this method to calculate personality types not only within the sample but also more generally.
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