

An Investigation on the Factor Structure of Hindi Version of Oxford Happiness Questionnaire (OHQ)*

Una investigación sobre la estructura factorial de la versión hindú del Cuestionario Oxford de Felicidad (OHQ)

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ABSTRACT

This study examines the factor structure of the Hindi version of the Oxford Happiness Questionnaire (OHQ) (Hills & Argyle, 2002) in a sample of 1000 Indian university students. OHQ is a widely used in positive psychology research. Exploratory factor analysis (EFA) has resulted in six factors. Another study has been carried to test the results of EFA and other reported models with a sample of 800 students. Confirmatory factor analysis has resulted in the six-factor model showing a better fit against the other tested models. The study results support the multi-dimensional structure of OHQ. The factor structure of OHQ in India has some common factors and many differences when compared to the Euro-American studies.

Keywords

Happiness; OHQ; India; University Students; Culture; Factor structure; Model Fit.

RESUMEN

Este estudio examina la estructura factorial de la versión hindú del Cuestionario Oxford de Felicidad (OHQ) (Hills & Argyle, 2002) en una muestra de 1000 estudiantes universitarios indios. El OHQ es ampliamente utilizado en la investigación de la psicología positiva. El análisis factorial exploratorio (AFE) ha dado como resultado seis factores. Se realizó otro estudio para evaluar los resultados del AFE y otros modelos informados con una muestra de 800 estudiantes. El análisis factorial confirmatorio resultó en el modelo de seis factores mostrando un mejor ajuste en contraste con los otros modelos probados. Los resultados del estudio apoyan la estructura multidimensional del OHQ. La estructura factorial del OHQ en India tiene algunos factores comunes y muchas diferencias en comparación con los estudios euroamericanos.

Palabras clave

felicidad; OHQ; India; estudiantes universitarios; cultura; estructura factorial; ajuste del modelo.

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Traditionally, psychologists have paid greater attention to the concept of 'unhappiness' which has many forms like depression, anxiety, stress, and burnout. This has led to

an imbalance between the number of studies on depression and studies on positive emotions. However, recent research on positive psychology has thrown light on the concept of happiness and studies on happiness are on the rise (Diener, 2000; Argyle, 2001). Happiness and depression are the opposite ends of a bipolar valence dimension (Russell & Barrett, 1999), because one looks at the positive side while the other looks at the negative part of the emotions.

Lu, Gilmour and Kao (2001) have defined happiness as a two-dimensional process namely the predominance of positive over negative affect and as satisfaction with life as a whole. Diener, Suh, Lucas and Smith (1999) in their seminal work on components of subjective well-being have conceptualized psychological or subjective well-being as a broad construct encompassing four specific and distinct components. These components include: (a) pleasant affect or positive well-being (e.g., joy, elation, happiness, and mental health), (b) unpleasant affect or psychological distress (e.g., guilt, shame, sadness, anxiety, worry, and anger), (c) life satisfaction or a global evaluation of one's life, and (d) domain or situation satisfaction (e.g., family, leisure, and health). In summary, though there are many paradigms of well-being are available, no consensus has yet arrived on the components of well-being as cultural differences need to be addressed (Vaingankar et al., 2012). Hence, not only the term subjective well-being but also the components of subjective well-being are multi-dimensional (Holder, 2012; Pavot, 2018).

Though there are controversies on the objective and subjective measurement of happiness as well as on the distortions that could happen when subjects are asked to rate their happiness (Veenhoven, 1991), a large number of scales have been developed to measure happiness. Of the various measures, the Oxford Happiness Questionnaire (OHQ) is the most widely used questionnaire in the study of happiness and well-being (Chamorro-Premuzic, Bennett & Furnham, 2007).

Argyle, Martin and Crossland (1989) developed the Oxford Happiness Inventory (OHI) along the lines of the Beck Depression

Inventory (Beck, Ward, Mendelson, Hock & Erbaugh, 1961) with 32 items that encompass positive affect, negative affect, and subjective well-being. Each item was presented in four incremental levels with ratings from 0 to 3. After testing this inventory with graduate students of psychology, they finalized the inventory with 29 items. Hills and Argyle (2002) revised the OHI and devised the Oxford Happiness Questionnaire (OHQ) with 29 items by adopting six-point Likert scale and reversing about half of the items. They opined that OHQ is an improved scale over the OHI with better psychometric properties.

However, few questions have raised doubts on the factor structure of OHQ. First, the study on 172 undergraduate students has resulted in a seven-factor structure for the OHI and an eight-factor structure for OHQ (Hills & Argyle, 2002). While describing the structure adopted for designing OHI, Hills and Argyle (2002) state that they have taken mainly the positive affect, negative affect, subjective well-being and happiness factors into account, but the resultant seven factors have not been discussed vis-a-vis the definition taken. Even for the seven factors retrieved, the items in these factors have not been reported. However, they state that the seven factors are similar to the factors retrieved by the earlier study of Hills and Argyle (1998).

Hills and Argyle (2002) have extracted the eight factors from OHQ, but they could not interpret them clearly. Varimax rotation had resulted in similar items falling in 2 or more factors, and they were not satisfied with the results. Further, the factors of OHQ reported a low correlation with factors of OHI. They argue that the more significant number of factors (8 factors) extracted might have been the cause of non-interpretability but attempts to extract fewer factors also could not explain a higher variance, aiding researchers to analyze the factor structure of OHQ. As the factor analysis of OHQ could not result in a clear factor structure, they have suggested that the sum of all the item scores is an overall measure of psychological well-being with high scores indicating higher well-being. When OHI with seven factors could not be

interpreted, a detailed study on a larger sample may prove to be fruitful in explaining the factor structure of the OHQ. They also state that the primary aim of designing OHQ and analyzing the psychometric properties is to place the OHQ in the public domain for further examination. Till date, no evidence could be found on the use of the confirmatory factor analysis (CFA) techniques in confirming the factor structure of OHQ.

As OHQ is the widely used questionnaire in positive psychology research, the issue is whether the OHQ can be used as a uni-dimensional or as a multi-dimensional measure. The standard uni-dimensional approach for the quality of life measures would fail mostly as unidimensionality is the strict requirement (Slocum-Gori, Zumbo, Michalos & Diener, 2009). Also, there is a possibility of differences in the factor structure of OHQ across nations. Differences in the level of happiness among countries are very large as happiness depends on the aspirations of the people to adjust and the standards of life (Veenhoven, 2010; Wang & Wang, 2016). The characteristics of the nation also play a significant role in explaining the nature and levels of happiness (Diener, Tay & Oishi, 2013; Oishi & Gilbert, 2016). Diener, Suh, Lucas and Smith (1999) have shown that the national culture moderates the relation among the components of subjective well-being.

It is possible that happiness takes different forms across cultures. Culture influences the feelings and emotions of a person, and in turn, these emotional experiences may influence her/his level of happiness and perception of happiness. In the West, happiness is conceptualized as more related to intrapersonal or internal evaluation whereas in China happiness is more related to interpersonal or external evaluation (Lu & Shih, 1997). In fact, Kitayama, Markus and Kurokawa (2000) suggest that how we understand, and experience well-being varies with the level of individualism and collectivism in a culture (Ahuvia, 2002). Self-esteem is valued more by individualistic culture and more related to life satisfaction but

less realistic in collectivistic culture (Diener & Diener, 2009).

Furthermore, the predictors of life satisfaction differ between individualist and collectivist societies (Oishi, Diener, Lucas & Suh, 1999) and individualists consider their own satisfaction more frequently than collectivists (Diener et al., 1999). In certain cultures, people do not report feelings of depression, sadness and guilt openly as in Indian culture (Argyle, 2001). There is a huge difference between the American and Asian culture in terms of how people conceive happiness and what determines happiness (Howell, Chong, Howell & Schwabe, 2012; Uchida & Ogihara, 2012) and especially the Indian perspective of happiness and the hedonic notion of happiness of the Western nations (Nagar, 2017). These studies have led some researchers to theorize that culture influences well-being (Church, 2000). Hence, countries differ in their happiness levels because of ethnic, cultural, economic, political and religious differences. The focus of cross-cultural perspectives on happiness is essential to eradicate the risk of assuming universal conditions of human well-being. The impact of culture and cultural norms are high on the perceived well-being thereby giving room to analyze the factors of happiness (Argyle, 2001; Islam, 2012). Diener, Oishi and Ryan (2013) have opined that both the structure of subjective well-being (SWB) and its components have culture-specific aspects that need to be widely researched.

India is an interesting case for studies on happiness as it is a unique country with cultural traditions unlike anywhere else in the world (Biswas-Diener, Tay & Diener, 2012). With the rapid economic development and growth in Information Technology (IT) sector, the nation is on the brink of changes. This has led many researchers (Chakraborty et al., 2018; Veenhoven, 2010) trying to understand the happiness of the Indian continent.

Because of the growth of IT sector, the work patterns of Indian workforce have changed. This has led to increased stress and depression levels among Indian professionals. According to the estimates of PPC worldwide, more than 62% of

health concern in India in the year 2012 was due to work stress. In a study by Saddichha (2010), it is reported that 19% of the college-going population suffers from depression and anxiety disorders. 72% of students in India are reported to suffer from stress and its ill-effects. Sixteen thousand students in India committed suicide between 2004 and 2008 because of stress (Economic Times, April 5th, 2013). Though Indians are reported to be less stressed than their western counterparts (Sinha, Willson & Watson, 2000), the level of depression among Indians are on the rise. Hence, a study on happiness in India at the current situation is warranted.

Few studies have tried to understand the factor structure of OHI, but no study has made use of OHQ. The results of the studies on OHI are not conclusive on the final structure. Hills and Argyle (1998) reported a seven-factor structure with 56.25% of variance explained on a sample of 275. After a few years, Hills and Argyle (2002) confirmed the seven-factor structure with 60.9% of variance explained with a sample of 172 subjects. Furnham and Brewin (1990) extracted nine factors with eigenvalues > 1 , but they admit that only three factors with 38.30% of variance explained were interpretable. Meleddu, Guicciardi, Scalas and Fadda (2012) reported a five-factor structure for the Italian Version of OHI, and they also confirmed the structure with exploratory structural equation modeling in a sample of 782 adolescents. Chiang, Lin and Lee (2016) have reported a three-factor structure for the Chinese Version of OHI, which is referred to as CHI. Liaghatdar, Jafari, Abedi and Samiee (2008) have established the internal reliability, construct and content validity of OHI among Iranian students. With all these differing results, OHI is widely used in the American, European and Asian countries as either uni-dimensional (Flynn & MacLeod, 2015; Medvedev et al., 2017) or with seven or three-factor structure (Meleddu, Guicciardi, Scalas & Fadda, 2012). Hence, there is the need to understand the underlying factor structure of OHQ in the Indian context. The present study aims to address this issue using exploratory as well as confirmatory factor analysis techniques.

Study 1

Study 1 aims to understand the factor structure of OHQ using exploratory factor analysis.

Methods

Sample Size and Participants

There are two main ways of determining the sample size either by roughly estimating the absolute sample size or by using the item ratios. This study has used the latter approach. For exploratory factor analysis, the minimum subject to item ratio suggested is 5:1 (Gorsuch, 1990), 10:1 (Nunnally, 1978), and 20:1 (Hair, Anderson, Tatham & Black 1998). As opinion is divided, this study has used a ratio of 20:1 for better results. Given this ratio, the sample determined is 580. However, Comrey and Lee (1992) have suggested that an absolute sample size 500 is very good whereas a sample of 1000 is excellent as it gives a better frame for analysis as a larger sample enables better precision. Hence 1000 responses were collected. The participants were briefed about the study and then given the OHQ questionnaire. The participants were given enough time to fill in the questionnaire.

1000 Indian university students pursuing their undergraduate education participated in the study. Of these, 130 responses had missing data which were rejected for analysis. Hence, for analysis, only 870 datasets were taken. The mean age of respondents is 21.53 years with a standard deviation of 0.69. Out of the 870 respondents, 599 were males, and 271 were females.

Questionnaire

The questionnaire used for this study is the OHQ (Hills and Argyle, 2002) which is a 29-item measure on a 6-point scale ('1' indicates strongly agree and '6' indicates strongly disagree). The questionnaire was translated into Hindi, the official language of India by four independent translators. For the items where translations were

different, the translators had a discussion, and the final agreed version was taken. The agreed Hindi version of OHQ was again back-translated by two independent translators, and then the valid Hindi version of OHQ was finalized.

Results

Reliability

The reliability of the questionnaire is checked using chronbach’s alpha. The chronbach’s alpha is 0.82, which shows that the internal reliability of the tool for this data set is acceptable.

Exploratory Factor Analysis

The initial principal component factor analysis has resulted in a six-factor solution with 63.97% of variance explained. For better interpretation of the factor structure, oblimin rotation is adopted as the factors are related. Table 1 represents the results of the exploratory factor analysis.

Table 1
Exploratory factor analysis- OHQ

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
OHI Q1					0.41	
OHI Q2						0.73
OHI Q3			0.57			
OHI Q4						0.48
OHI Q5					0.82	
OHI Q6					0.59	
OHI Q7	0.55					
OHI Q8						
OHI Q9			0.70			
OHI Q10			0.47			
OHI Q11		0.48				
OHI Q12			0.74			
OHI Q13				0.49		
OHI Q14				0.79		
OHI Q15		0.71				
OHI Q16		0.46				
OHI Q17						0.49
OHI Q18	0.58					
OHI Q19				0.53		
OHI Q20	0.71					
OHI Q21	0.73					
OHI Q22		0.63				
OHI Q23				0.56		
OHI Q24			0.50			
OHI Q25	0.69					
OHI Q26	0.69					
OHI Q27			0.80			
OHI Q28			0.75			
OHI Q29			0.83			

Note.The factor loadings less than 0.4 have been suppressed.

Items with factor loadings above 0.4 are only considered for this study as suggested by Costello and Osborne (2005). Item 8 failed to load with loading greater than 0.4. The oblimin rotation has resulted in a six-factor structure. The six factors are roughly labeled as life satisfaction, confidence, joy, self-esteem, positive mindset, and Social Interest. Table 2 reports the items falling under each of these factors.

Table 2
Factor Structure-OHQ

Factor	Items	Cronbach’s Alpha
1. Positive Mindset	7, 18, 20, 21, 25	0.83
2. Joy	11, 15, 16, 22	0.86
3. Life Satisfaction	3, 9, 10, 12, 24, 27, 28, 29	0.91
4. Confidence	1, 5, 6	0.81
5. Self Esteem	13, 14, 19, 23	0.86
6. Social Interest	2, 4, 17, 26	0.87

Note.Items are numbered as same as in OHQ

It is unclear whether all these factors converge into the domain of happiness. Hence, a principal component factor analysis is attempted. Such an analysis is useful to extract the uni-dimensional model by restricting the extraction to a single factor. Surprisingly, the single factor could explain only 26.32% of the variance. Thus, the uni-dimensional model could account for only half the variance explained by the six-factor model.

Study 2

The factor structure generated using EFA in study 1 is tested using Confirmatory Factor

Analysis (CFA) in study 2. Apart from the six-factor model, the other reported models of OHI viz seven-factor structure of Hills and Argyle (1998), three-factor structure of Furnham and Brewin (1990) and five-factor-structure of Meleddu et al. (2012) were also tested. The differing models of OHI were also tested because of several reasons. Firstly, OHQ was devised from OHI with minimal changes like adopting the Likert scale and reversing few items. Secondly, the number of items in OHQ and OHI remains

the same. Thirdly, OHQ is claimed to be a better version of OHI.

Participants and Procedure

800 Indian university students pursuing their undergraduate education participated in the study. The mean age of respondents is 21.62 years with a standard deviation of 0.81. Out of the 800 respondents, 430 were males, and 370 were females. Of the 800 responses, 145 had missing data which were rejected for analysis. Hence, for analyses, only 655 datasets were taken.

Results

The factor structure extracted from EFA is tested for the fit using Confirmatory Factor Analysis (CFA). CFA allows a researcher to test the relationship between the observed variable and their underlying latent constructs. AMOS 7.0 is used to do CFA. As Maximum likelihood estimation is the default method in AMOS, the pre-requisite for applying the maximum likelihood estimation needs to be checked. Muthen and Kaplan (1992) have suggested that if the variables have skewness and kurtosis ranging from -1 to +1, then estimating parameters with maximum likelihood method is acceptable. The kurtosis for the 27 items (except item 1 and 8) is found to be lying between -0.94 to 0.84 and skewness lying between -0.91 to 0.73. Hence, maximum likelihood estimation could be applied in estimating the model fit.

CFA is done to analyze the uni-dimensional, six-factor model (as extracted from EFA) and the other reported models of OHI. Table 3 presents the indices for all the tested models. Tucker Lewis Index (TLI) and Comparative Fit Index (CFI) should be higher than 0.90 for accepting a model. As well the Root Mean Squared Error of Approximation (RMSEA) should be less than or equal to 0.05 and the ratio of chi-square to its corresponding degrees of freedom (χ^2/df) should be less than or equal to 5 is required (Hu & Bentler, 1999).

Table 3
Indices for Tested Models

Structure of OHQ	TLI	CFI	RMSEA	χ^2/df
Uni-Dimensional	0.64	0.68	0.10	6.97
Six Factor Model (extracted by EFA)	0.91	0.93	0.05	3.64
Three Factor Model (Furnham & Brewin, 1990)	0.73	0.78	0.09	6.76
Seven Factor Model (Hills & Argyle, 1998)	0.84	0.86	0.06	4.34
Five Factor Model (Meleddu et al., 2012)	0.86	0.88	0.06	5.06

The six-factor model yielded fit indices of TLI, (0.91), CFI (0.92), and RMSEA (0.05), falling within the acceptable limits. Hence, the six-factor model extracted using EFA in study 1 shows a good fit. The uni-dimensional model does not show good fit as the indices of TLI (0.61), CFI (0.68), and RMSEA (0.10) are wider than the acceptable limits. Similarly, the other models tested also do not show good fit.

Both the exploratory and the confirmatory factor analysis could not support the uni-dimensional model of OHQ. It could be argued that the wider facets that are included in the construction of OHQ have resulted in the non-convergence of the items into a single domain. As happiness has been looked from the dimensions of negative and positive emotions, well-being, joy and cheerfulness, OHQ has reported a multi-dimensional model rather than a unidimensional model.

Discussion

The results of the exploratory factor analysis of OHQ have resulted in a six-factor structure. While tested via CFA, the six-factor model reported a good fit and the uni-dimensional model as proposed by Hills and Argyle (2002) was found to be less fitting than the six-factor model. The findings show that OHQ is a multi-dimensional scale which in turn agrees with the multidimensional framework of psychological well-being. The six-factor structure of OHQ is mainly in line with the multi-dimensional structure of OHQ, although it slightly varies from the multi-dimensional models of OHI as

proposed by Furnham and Brewin (1990), Hills and Argyle (1998), and Meleddu et al. (2012). Although the six-factor structure of OHQ includes factors such as self-esteem, confidence, positive mindset and social interest, all these factors can be considered as antecedents of happiness rather than factors of happiness as self-concepts have reported to be strongly associated with psychological well-being (Thiruchelvi & Supriya, 2012). Hence, the results of this study strongly support the multi-dimensional approach of well-being and particularly OHQ.

The factor structure of OHQ in India has some common factors and many differences when compared to the Euro-American studies. Meleddu et al. (2012) have reported that items like 'looking attractive', 'feeling mentally alert', 'satisfied with life', 'being happy' are all related. Hills and Argyle (1998) have shown that satisfaction with life comprised of items like 'ability to take anything' and 'decision making'. This study has shown that the items 'feeling that one's life is good', 'world is a good place to live' and 'having a purpose of life' are related to the memories of past and satisfaction with life. This shows that life satisfaction in India is not being judged based on the present conditions alone as in Western culture, but by evaluating the past experiences of life too. It is a unique characteristic of India.

This study reports that feeling healthier is related to satisfaction with life. This result is in congruence with the results of Gerdtham and Johannesson (2001). Items namely 'laugh a lot', 'finding beauty in something', 'experience joy and elation' are grouped in this study. The study by Furnham and Brewin (1990) reported items namely 'taking a decision', 'experience joy', 'having control of life' in one group. Hence, people experience joy at individual levels in the Euro-American culture, which is a characteristic of an individualistic culture. In India, self-related concepts like 'controlling life', and 'taking decisions' are grouped, and it is not related to joy.

Meleddu et al. (2012) found items namely 'laugh a lot', 'ability to take anything', 'having great energy' falling in the same group of self-fulfillments whereas these study results are

different. Westerners practice self-maintenance strategy like self-enhancement which is not found in Asians (Lu & Gilmour, 2004), especially Indians. Joy and self-concept are two different factors in the Indian context. Self-esteem is more related to satisfaction with life in Hill and Argyle's (1998) study. Hence, self-concept is more related to satisfaction with life in the Euro-American culture. This is not the case in Indian culture. Similar results were reported by Diener and Diener (2009), and Moksnes and Espnes (2013). Bhagavad Gita, the holy book for Hinduism, the major religion of India insists on doing the duty without expecting the results. Hence, satisfaction with life is not related to being confident of doing one's duty or having high self-esteem.

Feeling a sense of purpose of life and mentally alert and having great energy are related to self-concepts. Hence, a person's self-concept is more related to cognition and action-oriented in the West, which is called an independent self or Euro-American self-ways (Markus & Kitayama, 1998). Indians view self as being bound to others, which is called as interdependent self or Asian Self-Ways (Markus & Kitayama, 1998). The item 'pleased with the way I am' is a component of satisfaction with life in Meleddu et al.'s (2012) study, but it is part of confidence in this study. In the West, life satisfaction is related to enthusiasm, but in India, life satisfaction is related to emotions like peace and harmony.

A striking difference noted in this study is that the item 'having a good influence over events' is related to a positive outlook in the West (Hills & Argyle, 1998), but it is related to sociability in India. Indians do not look an event as a sequence of actions, but they consider it as a sequence of people involved processes. This is a critical difference as India is a collectivist country and the West is characterized by individualism. Happiness in India is always a collective concept (Nagar, 2017).

Hence, OHQ is a combination of many psychological characteristics. Any model of happiness could not explain many of these factors, for example, self-esteem and self-efficacy. It has already been reported that the item

content of OHQ failed to differentiate subjective well-being from its antecedents and precedents (Kashdan, 2004). The potential development of a revised OHQ is possible as OHQ is a widely used measure and is also available in the public domain.

Even though reliabilities are satisfactory for all the six factors, the number of negative items in the tool is quite lesser when compared to the positive items. This unequal ratio of positive and negative items hints at the psychometrically unsatisfactory nature of the tool. Hence, reversal of some of the items should be generated, and further factor structure can be analyzed. Though the six factors generated could be explainable, the existence of the superordinate general factor 'happiness' should be looked into. Hence, a hierarchical model can be tested.

The study has not attempted to establish the existence of the happiness domain. It is advised for the researchers to explore the factor structure of the tool and use it for further analysis. A valid measurement tool with well-structured subscales is of great help in research to understand the concept in a better way. Since happiness is an abstract construct, it has to be handled with utmost care while measuring the construct and its sub components. Until the subcomponents and the construct are generalized with repetitive studies, work on the area of happiness with OHQ will remain vague. The validation of OHQ across different samples is still open.

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Notes

- * Research article.