MLQ Psychometric Analysis

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**Introduction**

The Meaning in Life Questionnaire (MLQ), (Steger, 2012) is one of the most widely used and validated purpose and meaning scales. It was designed to include two factors one getting at a sense of presence of purpose (MLQ-P) and the other searching for purpose (MLQ-S). Each factor has five items. The purpose of this analysis is threefold. First to see whether this factor structure held up for youth population, because all other validation studies have been conducted on an adult or college age population. Second, in the literature review of this thesis I suggested, based on the literature and meaning and purpose were two integral parts of the same factor that could not easily be separated out from each other. If one has meaning one has purpose and vice versa. Since the MLQ uses the language of both meaning and purpose, this was a perfect case study to see if respondents saw a difference between the two. I, thus, wanted to see whether there was a dichotomy between these two wordings, meaning and purpose, in the items. I hypothesized that if there was a difference it would be small in nature and a second-order model would show that they are really part of the same factor. Third, to test whether MLQ represented is a distinct factor in comparison to factors such as self-concept and whether is correlated with other purpose scales. For this a convergent and discriminant validity test was carried out.

**Exploratory Factor Analysis**

A two factor model was tested using Confirmatory Factor Analysis (CFA), Number of observations used was 970. The fit was good,  for the model was 34 with a  = 32.47, *p* < 0.18; CFI =0.98, TLI = 0. 974, RMSEA = 0.052 [90% CI = 0.042, 0.061].

Loadings (see Table 1) were all above 0.30 and the correlation between the two factors was 0.14 indicating two distinct factors.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | MR2 | MR1 | h2 | u2 | com |
| MLQ 1 | 0.01 | 0.81 | 0.66 | 0.34 | 1.00 |
| MLQ 4 | 0.05 | 0.78 | 0.62 | 0.38 | 1.01 |
| MLQ 5 | 0.05 | 0.77 | 0.61 | 0.39 | 1.01 |
| MLQ 6 | 0.02 | 0.79 | 0.62 | 0.38 | 1.00 |
| MLQ 9 | -0.24 | 0.45 | 0.23 | 0.77 | 1.53 |
| MLQ 2 | 0.81 | -0.08 | 0.64 | 0.36 | 1.02 |
| MLQ 3 | 0.74 | 0.08 | 0.57 | 0.43 | 1.02 |
| MLQ 7 | 0.72 | 0.07 | 0.54 | 0.46 | 1.02 |
| MLQ 8 | 0.72 | 0.09 | 0.55 | 0.45 | 1.03 |
| MLQ 10 | 0.83 | -0.12 | 0.68 | 0.32 | 1.04 |
| SS loadings | 3 | 2.72 |  |  |  |
| MR2 | 1.00 | 0.14 |  |  |  |
| MR1 | 0.14 | 1.00 |  |  |  |

Table 1: Factor Loadings for ESOM of MLQ, Two Factors MLQ-P and MLQ-S

Parallel Analysis using Maximum Likelihood also suggested that there are two factors in the measure. Eigenvalues also analysis suggested that there was two factors factor. The first factor had and eigenvalue of 3.15 wits SD of 1.92 and explained 37% of the variance, the second factor had an eigenvalue of 2 and SD of 1.68 and explained 28% of the variance, the third factor had an eigenvalue of .05 and SD of .7 and explained 7% of the variance. This underscored the two factor model.

An analysis with two factors was conducted using EFA. The fit was identical to the CFA. Loadings (see Table 2) were good and items loaded well on their respective factors (see table 2) and the correlation between the two was low. Thus, I conclude that there are two clear factors here, one presence of purpose and the second searching for purpose and they both work well on a youth population.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | ML1 | ML2 | h2 | u2 | com |
| MLQ 1 | -0.01 | 0.81 | 0.66 | 0.34 | 1.00 |
| MLQ 2 | 0.81 | -0.06 | 0.64 | 0.36 | 1.01 |
| MLQ 3 | 0.74 | 0.09 | 0.57 | 0.43 | 1.03 |
| MLQ 4 | 0.03 | 0.78 | 0.62 | 0.38 | 1.00 |
| MLQ 5 | 0.03 | 0.78 | 0.61 | 0.39 | 1.00 |
| MLQ 6 | 0.00 | 0.79 | 0.62 | 0.38 | 1.00 |
| MLQ 7 | 0.72 | 0.09 | 0.54 | 0.46 | 1.03 |
| MLQ 8 | 0.72 | 0.11 | 0.55 | 0.45 | 1.04 |
| MLQ 9 | -0.25 | 0.44 | 0.23 | 0.77 | 1.58 |
| MLQ 10 | 0.83 | -0.11 | 0.68 | 0.32 | 1.03 |
| SS loadings | 2.98 | 2.74 |  |  |  |
| ML1 | 1.00 | 0.15 |  |  |  |
| ML2 | 0.15 | 1.00 |  |  |  |

Table 2: Factor Loadings for Exploratory Factor Analysis with Oblimin Rotation of APSI

Within these two factors I then attempted to look for evidence of there being two factors, meaning and purpose. This is based on the view of some in the literature that meaning and purpose are tow distinct, albeit related, factors (Damon, 2008, Bronk, 2009.

I first tried to separate out the meaning and purpose questions from the entire MLQ instrument both searching for and presence of purpose using target rotation. However, all the items just loaded on their presence of purpose and searching for purpose factors and did not load on the meaning and purpose questions (see table 3). I then tried a structural equation modelling solution where I set correlations between the factors at zero. The fit ended up being extremely poor,  for the model was 27 with a  = 2609.119, *p* < 0.00; CFI =0.331, TLI = 0.108, RMSEA = 0.314 [90% CI = 0.304, 0.324] and the items did not load on the factors (see table 4 and plot 1).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | MR2 | MR1 | h2 | u2 | com |
| MLQ-P1 Meaning | 0.78 | -0.24 | 0.65 | 0.35 | 1.19 |
| MLQ-S2 Meaning | 0.25 | 0.74 | 0.62 | 0.38 | 1.23 |
| MLQ-P5 Meaning | 0.76 | -0.19 | 0.61 | 0.39 | 1.12 |
| MLQ-S10 Meaning | 0.22 | 0.80 | 0.70 | 0.30 | 1.16 |
| MLQ-S3 Purpose | 0.38 | 0.65 | 0.58 | 0.42 | 1.61 |
| MLQ-P4 Purpose | 0.77 | -0.19 | 0.62 | 0.38 | 1.12 |
| MLQP-6 Purpose | 0.77 | -0.22 | 0.62 | 0.38 | 1.16 |
| MLQ-S8 Purpose | 0.38 | 0.61 | 0.54 | 0.46 | 1.67 |
| MLQ-P9 Purpose | 0.33 | -0.35 | 0.23 | 0.77 | 1.99 |
| SS loadings | 2.89 | 2.28 |  |  |  |
| MR2 | 1.00 | 0.03 |  |  |  |
| MR1 | 0.03 | 1.00 |  |  |  |

Table 3: Factor Loadings for Confirmatory Factor Analysis of MLQ with Target Rotation, Two Factors Meaning and Purpose

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor | op | Veriable | Loadings |
| 1 | Purpose | =˜ | MLQ 1 | 0.69 |
| 2 | Purpose | =˜ | MLQ 2 | 0.08 |
| 3 | Purpose | =˜ | MLQ 5 | 0.95 |
| 4 | Purpose | =˜ | MLQ 10 | 0.06 |
| 5 | Meaning | =˜ | MLQ 3 | 0.25 |
| 6 | Meaning | =˜ | MLQ 4 | 0.88 |
| 7 | Meaning | =˜ | MLQ 6 | 0.75 |
| 8 | Meaning | =˜ | MLQ 8 | 0.24 |
| 9 | Meaning | =˜ | MLQ 9 | 0.33 |

Table 4: Factor Loadings for Confirmatory Factor Analysis with SEM (Lavaan) of MLQ, Two Factors: Meaning and Purpose



Plot 1

This underscored that the presence of purpose and searching for purpose factors were dominant and distinct. I then tested whether the purpose and meaning items in MLQ-S were separate factors. Item seven of the MLQ uses the word “significant” instead of meaning or purpose and therefore that was left out. Using a SEM model this resulted in a matrix that was not a positive definite and the second eigenvalue are was less than zero (-0.01) suggesting that the correlation between the two factors was larger than 1 (in this case 1.01). I therefore constrained the coloration between the two latent factors to 1 and ran the model again. This resulted in two eigenvalues of 2.02 and 0.02 and a correlation between the factors of 0.98 and the fit was terrible. The one factor model conversely had excellent fit measurements (see table 5 for a comparison of the one factor fit to the two factor fit). This clearly indicated that a one factor solution was a far better fit of the data than a two factor model and that in the searching for purpose scale meaning and purpose did not represent two distinct factors, on the contrary they were seen by respondents as being identical in content to each other.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Fit Measure | One Factor Model | Meaning/Purpose Model |
| 1 | Chisq | 7.95 | 56.67 |
| 2 | DF | 2.00 | 2.00 |
| 3 | P-Value | 0.02 | 0.00 |
| 4 | CFI | 1.00 | 0.97 |
| 5 | TLI | 0.99 | 0.90 |
| 6 | RMSEA | 0.06 | 0.17 |
| 7 | RMSEA ci upper | 0.02 | 0.13 |
| 8 | RMSEA ci lower | 0.10 | 0.21 |
| 9 | SRMR | 0.01 | 0.13 |

Table 5: Comparison of the one factor fit to the two factor fit

Yet, perhaps in the search for purpose and meaning questions people do not differentiate between the two because they have not yet experienced either. In addition, given that in the five item searching for purpose scale there was three terms, purpose, meaning and significance, it was possible that the addition of significance muddied the waters. Furthermore, searching for meaning and presence of meaning was only marginally correlated (0.14, see table 1) and thus meaning and purpose might be interpreted differently in the presence of purpose scale compared to the searching for purpose scale. It was therefore worth checking whether a meaning and purpose difference existed in the presence of purpose scale.

Thus, I wanted to see whether in the presence of purpose scale I could find a trace of two factors meaning and purpose. I therefore tried to fit three models and see how they compared to each other. The was the one factor model, the second was a two factor model—meaning and purpose—and the third was a second order mode (see tables 6, 7 and 8 and plots 2, 3 and 4).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor | op | Veriable | Loadings |
| 1 | Purpose | =˜ | MLQ 1 | 0.81 |
| 2 | Purpose | =˜ | MLQ 5 | 0.78 |
| 3 | Purpose | =˜ | MLQ 4 | 0.79 |
| 4 | Purpose | =˜ | MLQ 6 | 0.79 |
| 5 | Purpose | =˜ | MLQ 9 | 0.40 |
| 6 | MLQ 1 | ˜˜ | MLQ 1 | 0.34 |
| 7 | MLQ 5 | ˜˜ | MLQ 5 | 0.39 |
| 8 | MLQ 4 | ˜˜ | MLQ 4 | 0.38 |
| 16 | MLQ 9 | ˜1 |  | 2.44 |
| 17 | Purpose | ˜1 |  | 0.00 |

Table 6: Factor Loadings for Confirmatory Factor Analysis with Lavaan of MLQ-P, One Purpose Factor



Plot: 2

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | op | Veriable | Loadings |
| Purpose | =˜ | MLQ 1 | 0.83 |
| Purpose | =˜ | MLQ 5 | 0.79 |
| Meaning | =˜ | MLQ 4 | 0.80 |
| Meaning | =˜ | MLQ 6 | 0.80 |
| Meaning | =˜ | MLQ 9 | 0.39 |

Table 7: Factor Loadings for Confirmatory Factor Analysis with Lavaan of MLQ-P, Two Factors of meaning and purpose factors



Plot: 3

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor | op | Veriable | Loadings |
| 1 | Purpose | =˜ | MLQ 1 | 0.83 |
| 2 | Purpose | =˜ | MLQ 5 | 0.79 |
| 3 | Meaning | =˜ | MLQ 4 | 0.80 |
| 4 | Meaning | =˜ | MLQ 6 | 0.80 |
| 5 | Meaning | =˜ | MLQ 9 | 0.39 |
| 6 | Global | =˜ | Meaning | 0.98 |
| 7 | Global | =˜ | Purpose | 0.97 |

Table 8: Factor Loadings for Confirmatory Factor Analysis with Lavaan of MLQ-P Second Order Purpose and Meaning Factors



Plot: 4

Items loaded very well in all three models but slightly better on the two-factor and second order model. The fit for the models were almost identical although the two facto model was marginally better (see table 9). Yet the correlation between the two factors was also very (0.95) high indicating that there is very little difference between these two factors.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Fit Measure | One Factor | Two Factor | Second Order |
| 1 | Chisq | 33.94 | 25.68 | 25.68 |
| 2 | DF | 5.00 | 4.00 | 3.00 |
| 3 | P-value | 0.00 | 0.00 | 0.00 |
| 4 | CFI | 0.99 | 0.99 | 0.99 |
| 5 | TLI | 0.97 | 0.97 | 0.96 |
| 6 | RMSEA | 0.08 | 0.07 | 0.09 |
| 7 | RMSEA ci lower | 0.05 | 0.05 | 0.06 |
| 8 | RMSEA ci upper | 0.10 | 0.10 | 0.12 |
| 9 | SRMR | 0.02 | 0.02 | 0.02 |

Table 9: Measure of Fit

**MLQ with Positive instead of Negative Question**

There remained on issue with the MLQ-P and that is that the negatively worded question (MLQ-P 9) was not loading well on the factors at 0.40 and below. I therefore collected data from an additional 748 teenagers using the MLQ-P but replaced the negatively worded item (MLQ 9) with a positively worded item similar to one found in APSI (I have definite purpose in my life). I wanted to see whether this would result in a better fit for the data and whether it would support a two factor model: meaning and purpose. Goodness of fit measures were all excellent but the one factor fit was marginally better (see table 10), on the two factor model the correlation between the two factors was 0.99 both of these indicate a one factor solution as being the most appropriate solution.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Fit Measure | One Factor Fit | Meaning/Purpose Fit |
| 1 | Chisq | 16.30 | 15.56 |
| 2 | DF | 5.00 | 4.00 |
| 3 | P-Value | 0.01 | 0.00 |
| 4 | CFI | 1.00 | 1.00 |
| 5 | TLI | 1.00 | 0.99 |
| 6 | RMSEA | 0.05 | 0.06 |
| 7 | RMSEA ci upper | 0.03 | 0.03 |
| 8 | RMSEA ci lower | 0.09 | 0.10 |
| 9 | SRMR | 0.00 | 0.00 |

Table 10. Goodness of fit measures

Factor loadings for all items were very high (.89 and above see tables 11 and 12), this indicates that a one factor solution is preferable and that there is no discernable difference between items using the term meaning and those using the term purpose.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor | op | Veriable | Loadings |
| 1 | Purpose | =˜ | MLQ 1 1 | 0.94 |
| 2 | Purpose | =˜ | MLQ 5 1 | 0.93 |
| 3 | Purpose | =˜ | MLQ 4 1 | 0.96 |
| 4 | Purpose | =˜ | MLQ 6 1 | 0.95 |
| 5 | Purpose | =˜ | MLQ 11 1 | 0.89 |

Table 11: Factor Loadings for Confirmatory Factor Analysis with Lavaan of MLQ-P, One Purpose Factor

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Factor | op | Veriable | Loadings |
| 1 | Purpose | =˜ | MLQ 1 1 | 0.94 |
| 2 | Purpose | =˜ | MLQ 5 1 | 0.94 |
| 3 | Meaning | =˜ | MLQ 4 1 | 0.96 |
| 4 | Meaning | =˜ | MLQ 6 1 | 0.95 |
| 5 | Meaning | =˜ | MLQ 11 1 | 0.89 |
| 11 | Purpose | ˜˜ | Purpose | 1.00 |
| 12 | Meaning | ˜˜ | Meaning | 1.00 |
| 13 | Purpose | ˜˜ | Meaning | 1.00 |

Table 12: Factor Loadings for Confirmatory Factor Analysis with Lavaan of MLQ-P, One Purpose Factor

**Discriminant and Convergent Validity**

In order to check for validity, I conducted a discriminant and convergent analysis. For discriminant validity I tested MLQ as a two factor model—searching and presence of purpose with APSI second-order two factor model—Feeling Purpose Now and Future Goals—together with ADSQII academic self-concept items testing academic self-concept in four domains: English, Math, Science and general school subjects. Whilst MLQ-P correlated well with the higher order purpose factor of the APSI scale (0.694). As was expected the MLQ-S item did not correlate well with the higher order purpose scale of APSI (0.153). This was similar to how much it correlated with MLQ-P (0.163). This verified that the MLQ-P purpose scale is convergent with other scales that have been show to also measure the construct of purpose.

Besides for English and Math all the other self-concept measures correlated with each other between .40 and .70 but none of the self-concept items correlated with the MLQ-P items beyond 0.26. This showed that the MLQ-P and MLQ-S were distinct from the self-concept scale and was tapping a completely different construct (see table 13).

|  |  |  |  |
| --- | --- | --- | --- |
| Factor | op | Veriable | Loadings |
| MLQP | =˜ | MLQ 1 | 0.79 |
| MLQP | =˜ | MLQ 4 | 0.8 |
| MLQP | =˜ | MLQ 5 | 0.77 |
| MLQP | =˜ | MLQ 6 | 0.81 |
| MLQP | =˜ | MLQ 9 | 0.38 |
| MLQS | =˜ | MLQ 2 | 0.8 |
| MLQS | =˜ | MLQ 3 | 0.75 |
| MLQS | =˜ | MLQ 7 | 0.74 |
| MLQS | =˜ | MLQ 8 | 0.74 |
| MLQS | =˜ | MLQ 10 | 0.8 |
| Feeling Purpose Now | =˜ | APSI 1 | 0.87 |
| Feeling Purpose Now | =˜ | APSI 2 | 0.8 |
| Feeling Purpose Now | =˜ | APSI 5 | 0.69 |
| Future Goals | =˜ | APSI 4 | 0.84 |
| Future Goals | =˜ | APSI 7 | 0.79 |
| Future Goals | =˜ | APSI 8 | 0.82 |
| Purpose | =˜ | Feeling Purpose Now | 0.99 |
| Purpose | =˜ | Future Goals | 0.92 |
| English | =˜ | ASDQII 1 | 0.88 |
| English | =˜ | ASDQII 2 | 0.86 |
| English | =˜ | ASDQII 3 | 0.87 |
| English | =˜ | ASDQII 4 | 0.83 |
| English | =˜ | ASDQII 5 | 0.85 |
| Math | =˜ | ASDQII 6 | 0.9 |
| Math | =˜ | ASDQII 7 | 0.91 |
| Math | =˜ | ASDQII 8 | 0.92 |
| Math | =˜ | ASDQII 9 | 0.9 |
| Math | =˜ | ASDQII 10 | 0.91 |
| Science | =˜ | ASDQII 11 | 0.91 |
| Science | =˜ | ASDQII 12 | 0.9 |
| Science | =˜ | ASDQII 13 | 0.9 |
| Science | =˜ | ASDQII 14 | 0.9 |
| Science | =˜ | ASDQII 15 | 0.89 |
| Subjects | =˜ | ASDQII 16 | 0.83 |
| Subjects | =˜ | ASDQII 17 | 0.86 |
| Subjects | =˜ | ASDQII 18 | 0.85 |
| Subjects | =˜ | ASDQII 19 | 0.83 |
| Subjects | =˜ | ASDQII 20 | 0.84 |
| MLQP | ˜˜ | MLQP | 1 |
| MLQS | ˜˜ | MLQS | 1 |
| Feeling Purpose Now | ˜˜ | Feeling Purpose Now | 0.02 |
| Future Goals | ˜˜ | Future Goals | 0.16 |
| Purpose | ˜˜ | Purpose | 1 |
| English | ˜˜ | English | 1 |
| Math | ˜˜ | Math | 1 |
| Science | ˜˜ | Science | 1 |
| Subjects | ˜˜ | Subjects | 1 |
| MLQP | ˜˜ | MLQS | 0.16 |
| MLQP | ˜˜ | Purpose | 0.69 |
| MLQP | ˜˜ | English | 0.29 |
| MLQP | ˜˜ | Math | 0.17 |
| MLQP | ˜˜ | Science | 0.16 |
| MLQP | ˜˜ | Subjects | 0.26 |
| MLQS | ˜˜ | Purpose | 0.15 |
| MLQS | ˜˜ | English | 0.11 |
| MLQS | ˜˜ | Math | 0 |
| MLQS | ˜˜ | Science | 0.08 |
| MLQS | ˜˜ | Subjects | 0.05 |
| Purpose | ˜˜ | English | 0.17 |
| Purpose | ˜˜ | Math | 0.15 |
| Purpose | ˜˜ | Science | 0.12 |
| Purpose | ˜˜ | Subjects | 0.16 |
| English | ˜˜ | Math | 0.24 |
| English | ˜˜ | Science | 0.4 |
| English | ˜˜ | Subjects | 0.68 |
| Math | ˜˜ | Science | 0.52 |
| Math | ˜˜ | Subjects | 0.69 |
| Science | ˜˜ | Subjects | 0.7 |

Table 13: Factor Loadings for Discriminant and Convergent Validity

of MLQ-Present and MLQ Searching with APSI and Academic Self Concept using Lavaan

**Conclusion**

The point of this study was threefold. First I wanted to discover whether the meaning in Life Questionnaire (MLQ) would work with a teenage population. The results indicated that both searching for purpose and presence of purpose were two distinct and uncorrelated factors and were present for this population. Second I wanted to see whether there is a meaningful difference of factors between meaning and purpose as some have suggested (Bronk, 2009). There was little support in this data for meaning and purpose being two distinct factors. It seems that respondents see these two terms as interchangeable. This might indicate, as some in the literature have suggested, and I have maintained in the literature review section of this thesis, that meaning is a salient part of purpose and cannot be separated out it. This study supports the idea that a unified concept of purpose is made up of both a meaning aspect and a purpose aspect that most people see as both interchangeable and inseparable from each other. Finally the MLQ-P correlated with other purpose scales and did not correlate with self-concept scales indicating that it properly tapped the factor of purpose in life.