INFORMATION BRIEF

MAP
MOTIVATOR ASSESSMENT PROFILE

A statistical analysis called “exploratory factor analysis” was performed on the MAP questionnaire to uncover relevant patterns in the data. This initial step yielded 12 distinct factors that point to the importance of multiple motivational factors in employees' career pursuits. These factors demonstrate an overall good reliability and suggest potential avenues for further investigation into what motivates people at work.

Purpose of this study

The goal of the MAP questionnaire is to examine and reveal the top career motivators of people at work.

As a preliminary step to establish the validity and reliability of the questionnaire, we conducted an exploratory factor analysis (EFA) on the questionnaire items using established statistical methods.

Our goal was to examine the data we collected from 322 participants to understand the relationships among the 72 items of the questionnaire.

We did this by looking at the most important factors that influence the answers we received. This helped us figure out which items were related to each other and how many different groups of related items there were.

We then analysed these groups to understand how they were connected.

Participants

We collected data using an online version of the MAP questionnaire, administered through a reputable provider of paid online surveys, from 322 individuals residing in the United States aged between 18 and 65 years.

The sample comprised of 44% male, 52% female, 3% non-binary, and 1% transgender participants, from various job functions, including entry-level staff (33%), mid-level (28%), senior (11%), and management (28%) personnel, with 51% possessing a college degree or university diploma.

The sample also included individuals from 31 different industries and 25 job functions, with 14% working in the information technology sector, 11% in sales, 10% in education, and the remaining 65% in other sectors.

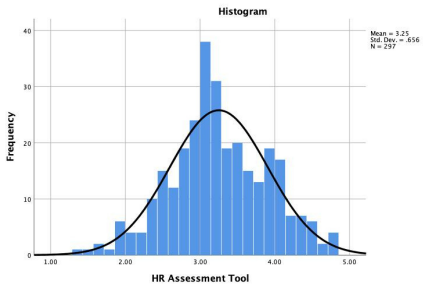
Outlier analysis

Following data collection, our initial priority was to prepare the data for EFA analysis. To achieve this, we used a series of data analysis techniques, including the Histogram, Boxplot, and Mahalanobis Distance Analysis.

These methods, which were carried out using both SPSS and JASP statistical software, were used to identify potential outliers within the data set. As a result of this screening process, data from 25 participants were deemed unsuitable and were excluded from further consideration.

Normality distribution

The revised dataset now consists of responses from 297 participants with a mean score of 3.25 and a standard deviation of 0.656. The distribution of scores is slightly spread out, not perfectly symmetrical, but it is still sufficiently balanced for us to obtain meaningful results from our analysis.



To confirm that our sample comes from a normal distribution, which is essential for many statistical analyses, we ran two tests called the Shapiro-Wilk and Kolmogorov-Smirnov tests.

The test results showed that the majority of our data closely follows a normal pattern. While there are some parts that deviate from normality, we adopted a more rigorous approach as well as a stricter model to ensure the accuracy of our factor analysis.

Adequacy for EFA

To ensure the quality of our dataset and determine whether it is suitable for factor analysis, we employed two well-known data inspection methods: the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and the Bartlett's test of sphericity.

The KMO measures how much the variables in a dataset are alike, and it can have a score between 0 and 1. Scores above 0.6 are considered good, while scores above 0.8 are excellent.

The Bartlett's test is used to determine whether the items are unrelated. If the test shows that the items are actually connected (i.e., have a significant p-value less than 0.05), then the dataset is suitable for factor analysis.

With an excellent overall KMO score of 0.941 and a p-value less than 0.05, our dataset is suitable for factor analysis.

Main highlights

- The MAP questionnaire with 72 items was administered to 297 participants in the USA, yielding a mean score of 3.25 (SD = 0.656).
- While the overall data follows a normal distribution, parts of the data showed deviations that required us to adopt a more strict analytical approach.
- The Shapiro-Wilk and Kolmogorov-Smirnov tests confirmed the data's normal distribution at the instrument level, but not entirely at the factor and item levels.
- The KMO score of 0.941 shows that the dataset is excellently suited for analysis, while Bartlett's test revealed a significant p-value of less than 0.05, confirming the dataset's readiness for factor analysis.

Factor extraction

In exploratory factor analysis, the extraction method helps us to reduce the many items of our questionnaire to a smaller set of factors that explain most of the variation in the dataset.

To find the set of factors that best capture the underlying structure of the data, we used an extraction method called Principal Axis Factoring (PAF). We decided to use it because the dataset as a whole met the normality assumptions, but certain variables within it did not, and because we believed that the factors underlying the data are correlated.

Factor retention

To retain the most meaningful factors, we used several criteria. One was the cumulative percentage of variance, where we set a threshold of 50% to determine the number of factors to retain. We also used the scree test and visually examined the eigenvalues for breaks and retained the number of factors corresponding to the number of datapoints above the break. Finally, we used the Kaiser's criteria, and retained for interpretation only factors with eigenvalues greater than 1.

Rotational method

Rotational methods are used to simplify and clarify the relationships between the factors. Orthogonal rotations, such as varimax, produce uncorrelated factors, whereas oblique rotations, such as direct oblimin, produce correlated factors. Given our expectation of correlated structures in the data, we opted for oblique rotations with direct oblimin.

Factor loading cut-off

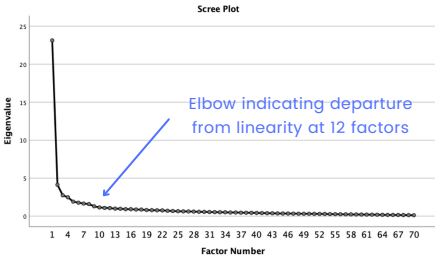
Factor loadings are numerical values that show how much each item contributes to a particular factor. Higher loadings indicate a stronger association between an item and the factor and are usually kept in the analysis, while items with lower factor loadings may be excluded. Typically, a loading cut-off of 0.35 or greater is used to retain items that have a significant relationship with the factor.

In our case, we used a combination of three criteria for retaining an item on its factor: (1) a primary factor loading of more than .35, (2) an alternative factor loading of less than .30, and (3) a difference of .20 between primary and alternative factor loadings.

EFA Results

Based on the statistical analysis of the scree plot, Kaiser's criteria, and the cumulative variance, we found that 12 factors explain a significant portion (55.20%) of the variance in the data.

While there is no specific threshold for the percentage of variance explained by the factors in the BPS and APA guidelines, as a general rule of thumb, it is generally advised that the factors should explain at least 50% or more of the total variance in the data to be deemed meaningful and interpretable.



We performed the EFA analysis multiple times to find and remove problematic items, checking to see if the data was grouped together in a way that made sense and if there were any issues with how different parts of the data were connected. After deleting five items, the 12-factor solution explained 56.70% of the data's variation, which is a 1.50% improvement towards the factors' meaningfulness and interpretability.

Validity

The main goal of assessing validity is to determine whether the MAP questionnaire is actually measuring the constructs that it claims to measure. To achieve this goal, we examined two crucial types of validity: convergent and divergent validity, which assess whether factors and items that are expected to be related are indeed related, and those that should not be related are not.

To check for these validity types, we examined the degree of association among the items, the proportion of variance that is accounted for by the items within each factor, the level of correlation between each item and its corresponding factor, and the intercorrelations among the factors.

The correlations between the factors range from low (r = -.011) to moderate (r =.463), indicating that the factors do, in fact, measure different constructs, providing evidence for discriminant validity. The average variance extracted (AVE) values for all 12 factors were close to the suggested threshold of 0.50, with 7 of the 12 factors having average loadings of 0.50 or higher, indicating that convergent validity is satisfactory with potential for further improvement in the confirmatory factor analysis stage.

Additional fit indices

Fit indices are used to assess the goodness of fit between the observed data and the factor model. In other words, they provide information about the dataset and indicate if the 12 factor solution is a good fit to the data.

In addition to KMO and Bartlett's Test of Sphericity, we can check the Root Mean Square Error of Approximation (RMSEA) and Tucker-Lewis Index (TLI).

An RMSEA value less than .05 indicates a good fit of the factor solution to the data, while a value greater than .05 suggests a poor fit. Alternatively, a TLI value near 1.0 implies an excellent fit, a value close to 0.5 is an adequate fit, and a value near 0 indicates a poor fit.

The 12 factor solution yielded a RMSEA of .03, indicating a good fit between the model and the data, which is further confirmed by the TLI of .93.

Reliability

To measure the MAP's reliability we used Cronbach's alpha (α) as a measure of internal consistency, with values of α =.70 and above being good, α =.80 and above being better, and α =.90 and above being excellent.

MAP Questionnaire - Unidimensional Reliability

Frequentist Scale Reliability Statistics

Estimate	Cronbach's α	Average interitem correlation
Point estimate	0.959	0.294
95% CI lower bound	0.952	0.256
95% CI upper bound	0.965	0.332

The internal consistency of the overall MAP Questionnaire was 0.96 ($p<.05$) which indicates that the items of the questionnaire represent a coherent set that reliably assess 12 different factors that may influence employee decisions to join, stay with, or leave a company.

Preparation for Confirmatory Factor Analysis (CFA)

In order to uphold the quality of our data for Confirmatory Factor Analysis (CFA), which is a statistical procedure used in the second validation phase to verify the structure of the model and further confirm the reliability and validity of the MAP Questionnaire, we revised several items to enhance their conciseness, clarity, and avoid double-barreled constructions.

Research principles

This research process adhered to the style guides for psychometric assessment and evaluation set forth by the British Psychological Society (BPS) and the American Psychological Association (APA), ensuring that the assessment tool conforms to rigorous scientific standards and principles.