METHODOLOGY AND STATISTICAL ANALYSIS REPORT

RIASEC-Goal Orientation Cross-Analysis

RESEARCH DESIGN
Cross-sectional correlational study examining relationships between career interests and achievement goal orientation using validated psychological instruments. **SAMPLE CHARACTERISTICS**
• Sample size: N = 14 participants • Data collection: Online survey format • Inclusion criteria: Completion of both RIASEC and goal orientation measures • Missing data handling: Complete case analysis (listwise deletion) **INSTRUMENTATION**
Holland's RIASEC Career Interest Inventory:
• 42 items measuring six career interest types • Response format: Yes (2), Maybe (1), No (0) • Dimensions: Realistic, Investigative, Artistic, Social, Enterprising, Conventional • Scoring: Mean scores calculated for each dimension • Reliability: Established in numerous validation studies
Achievement Goal Orientation Questionnaire:
• 21 items measuring four goal orientation types • Response format: 5-point Likert scale (-2 to +2, converted to 0-4) • Dimensions: Performance Approach, Mastery Approach, Performance Avoidance, Mastery Avoidance • Scoring: Mean scores calculated for each dimension • Theoretical basis: 2x2 achievement goal framework **DATA ANALYSIS PROCEDURES**
Descriptive Statistics:
• Central tendency and variability measures • Distribution assessment using Shapiro-Wilk tests • Outlier detection and handling *Correlational Analysis:*
• Pearson product-moment correlations for parametric data • Spearman rank correlations for non-parametric alternatives • Bonferroni correction considered but not applied due to exploratory nature • Effect size interpretation using Cohen's conventions *Multivariate Analysis:*
• K-means clustering for participant grouping • Principal Component Analysis for dimensionality reduction • Standardization applied before clustering • Optimal cluster number determined using elbow method *Individual Analysis:*
• Profile consistency measures (inverse of standard deviation) • Dominant type identification (highest scoring dimension) • Approach vs. avoidance tendency calculation • Performance vs. mastery orientation assessment **STATISTICAL ASSUMPTIONS**
• Independence: Participants responded independently • Normality: Assessed via Shapiro-Wilk tests; mixed results observed • Linearity: Examined through scatterplot inspection • Homoscedasticity: Visual inspection of residual plots • Missing data: Minimal due to complete case analysis **SOFTWARE AND TOOLS**
• Python 3.11 for data analysis • pandas for data manipulation • scipy.stats for statistical testing • scikit-learn for clustering and PCA • matplotlib/seaborn for visualization • reportlab for PDF generation **QUALITY ASSURANCE**
• Data validation and cleaning procedures implemented • Statistical assumptions checked and documented • Alternative non-parametric tests conducted where appropriate • Results replicated using different random seeds for clustering • Visualization quality assessment and standardization

DETAILED STATISTICAL RESULTS

Normality Assessment:

Shapiro-Wilk tests revealed mixed normality patterns: • Normal distributions: Realistic, Artistic, Enterprising, Conventional (RIASEC); Performance Approach, Mastery Approach, Performance Avoidance (Goal) • Non-normal distributions: Investigative, Social (RIASEC); Mastery Avoidance (Goal) • Implication: Both parametric and non-parametric analyses conducted *Correlation Analysis Results:*

24 correlations examined (6 RIASEC × 4 Goal dimensions): • Significant correlations: 2 (8.3%) • Medium to large effect sizes: 6 (25.0%) • Strongest correlation: Conventional ↔ Mastery Approach ($r = 0.675$, $p = 0.008$) • Weakest correlation: Enterprising ↔ Mastery Avoidance ($r = -0.003$, $p = 0.993$) *Effect Size Distribution:*

• Large effects ($|r| > 0.5$): 1 correlation • Medium effects ($0.3 < |r| < 0.5$): 5 correlations • Small effects ($0.1 < |r| < 0.3$): 11 correlations • Negligible effects ($|r| < 0.1$): 7 correlations *Clustering Analysis:*

K-means with k=3 selected based on: • Elbow method results • Interpretability of clusters • Sample size considerations • Silhouette analysis Cluster characteristics: • Cluster 0: 6 participants - Investigative/Performance Approach dominant • Cluster 1: 4 participants - Balanced profile group • Cluster 2: 4 participants - Mastery-oriented group *Individual Differences:*

• RIASEC consistency range: 1.63 to 4.55 • Goal consistency range: 1.25 to 3.85 • Approach-Avoidance range: -0.83 to 1.17 • Performance-Mastery range: -0.75 to 0.42

STATISTICAL POWER AND PRECISION

• Sample size (n=14) provides 80% power to detect large effects ($r > 0.68$) • Medium effects ($r = 0.50$) have approximately 45% power • Small effects ($r = 0.30$) have approximately 15% power • Confidence intervals wide due to small sample size • Results should be interpreted as exploratory and hypothesis-generating **RELIABILITY AND VALIDITY CONSIDERATIONS**

• RIASEC instrument has established psychometric properties • Goal orientation scale based on validated theoretical framework • Internal consistency not calculated due to sample size • Content validity supported by theoretical alignment • Construct validity suggested by expected correlation patterns **POTENTIAL CONFOUNDS AND LIMITATIONS**

• Sample composition bias (convenience sampling) • Temporal stability not assessed (single time point) • Cultural and demographic factors not controlled • Social desirability response bias possible • Range restriction may affect correlation magnitudes