Influence of Parsimony and Work-related Psychological Constructs in Predicting Turnover Intention when Using Machine Learning VS Regression

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For all of these analyses, the dataset was split into a training dataset of 80,000 and a testing dataset of 20,000. All predictive performance metrics were obtained through cross-validation on the testing dataset. A logistic regression analysis was conducted to predict turnover intention based on the set of 104 FEVS predictors. Overall accuracy across categories was 0.84, as can be seen in table 1. The weighted average precision was 0.84, with a recall of 0.78 and an F1 score of 0.80, suggesting a moderate level of prediction consistency across categories. The performance of a xgboosting model across categories was 0.86, as can be seen in table 2. The weighted average precision was 0.86, with a recall of 0.86 and an F1 score of 0.85, suggesting moderate levels of predictive accuracy. The performance of a neural network model across categories was 0.82, as can be seen in table 3. The weighted average precision was 0.85, with a recall of 0.86 and an F1 score of 0.85, suggesting moderate levels of predictive accuracy. The performance of a SVM model across categories was 0.79, as can be seen in table 4. The weighted average precision was 0.84, with a recall of 0.84 and an F1 score of 0.82, suggesting moderate levels of predictive accuracy. The performance of a random forest model across categories was 0.75, as can be seen in table 5. The weighted average precision was 0.81, with a recall of 0.81 and an F1 score of 0.79, suggesting moderate levels of predictive accuracy.

Table 1

Logistic Regression Predictive Metrics

	Precision	Recall	F1.score	AUC	Accuracy	Support
Class 0	0.85	0.61	0.71	0.87	NA	7,182.00
Class 1	0.83	0.95	0.89	0.87	NA	15,045.00
macro avg	0.84	0.78	0.80	0.87	0.84	NA
weighted avg	0.84	0.84	0.83	0.87	NA	NA

Note. 1= turnover intention, 0= no turnover intention.

Table 2

xgboosting Predictive Metrics

	Precision	Recall	F1.score	AUC	Accuracy	Support
Class 0	0.83	0.70	0.76	0.88	NA	7,182.00
Class 1	0.87	0.93	0.90	0.88	NA	15,045.00
macro avg	0.85	0.82	0.83	0.88	0.86	NA
weighted avg	0.86	0.86	0.85	0.88	NA	NA

Note. 1= turnover intention, 0= no turnover intention.

Table 3

Neural Network Predictive Metrics

	Precision	Recall	F1.score	AUC	Accuracy	Support
Class 0	0.83	0.70	0.76	0.88	NA	7,182.00
Class 1	0.87	0.93	0.90	0.88	NA	15,045.00
macro avg	0.85	0.81	0.82	0.88	0.86	NA
weighted avg	0.85	0.86	0.85	0.88	NA	NA

Note. 1= turnover intention, 0= no turnover intention.

Table 4

SVM Predictive Metrics

	Precision	Recall	F1.score	AUC	Accuracy	Support
Class 0	0.83	0.70	0.76	0.88	NA	7,182.00
Class 1	0.87	0.93	0.90	0.88	NA	15,045.00
macro avg	0.84	0.77	0.79	0.86	0.84	NA
weighted avg	0.84	0.84	0.82	0.86	NA	NA

Note. 1= turnover intention, 0= no turnover intention.

Table 5

Random Forest Predictive Metrics

	Precision	Recall	F1.score	AUC	Accuracy	Support
Class 0	0.83	0.70	0.76	0.88	NA	7,182.00
Class 1	0.87	0.93	0.90	0.88	NA	15,045.00
macro avg	0.81	0.73	0.75	0.86	0.81	NA
weighted avg	0.81	0.81	0.79	0.86	NA	NA

Note. 1= turnover intention, 0= no turnover intention.