Classification Accuracy and Consistency Under Different Maximum Information Locations

Abstract: When the purpose of a test is to classify examinees into different performance categories, it is important for researchers to choose the location of maximum information for high classification accuracy and consistency. The study investigated the classification accuracy and consistency estimated based on the Rudner approach and the Lee approach at different locations of maximum information with 3PL, and tested the role of discrimination parameter and other possible factors. Results show that the classification accuracy and consistency based on the Rudner approach are more likely to be influenced by the location of maximum information with relatively high level of discrimination parameter. Concretely, one should maximize information close to the group mean rather than cut score when a test is short (e.g., 20 items or 50 items) and the group mean is far from the cut score. And the differences between different locations of maximum information decrease as the test lengths increase. In contrast, the classification accuracy and consistency based on the Lee approach show less differences at different locations of maximum information.

Key words: item information, classification accuracy, classification consistency, discrimination parameter, item response theory

不同最大化信息量位置下的分类准确性与一致性

黄颖诗 [1]　陈平 [2]　张敏强 [3]
[1]北京师范大学中国基础教育质量监测协同创新中心/硕士生
[2]北京师范大学中国基础教育质量监测协同创新中心/副教授
[3]华南师范大学心理学院/教授

摘 要

当考试目的在于将考生分类时，如何选择最大信息量位置以获得高的分类准确性与一致性是降低决策风险的重要保障。然而，不同的指标计算方法对各类误差的敏感性存在差异，其估计结果受最大化信息量位置影响的效果尚未明晰。本研究通过蒙特卡洛模拟探讨 Rudner 方法与 Lee 方法在不同最大信息量位置下估计结果的变化，并考虑区分度以及其他可能因素的作用。结果表明：Rudner 方法在"相对高的区分度"条件下更容易受到最大信息量位置的影响，在"能力均值远高于或低于分界分数且题目量少"的条件下，偏向能力均值处最大信息量位置获得的分类准确性与一致性更高，不同位置的差异随题目数的增多而减少；而 Lee 方法在各条件组合下受最大信息量位置的影响均较小。

关键词：信息量、分类准确性、分类一致性、题目区分度、项目反应理论

[1]黄颖诗，北京师范大学中国基础教育质量监测协同创新中心硕士生
电子邮件：h_yingshi@163.com
[2]陈平，北京师范大学中国基础教育质量监测协同创新中心副教授
电子邮件：pchen@bnu.edu.cn
[3]张敏强，华南师范大学心理学院教授
电子邮件：2640726401@qq.com