EXPLORING LATENT CLASSES OF EXAMINEE RESPONSE TIME: 
AN APPLICATION OF THE GROWTH MIXTURE MODEL ON A 
MEDICAL LICENSURE EXAMINATION

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ABSTRACT

CONTEXT: The COMLEX licensure examinations are balanced with expected response time across item blocks. Nevertheless, there are subsets of examinees (30%) that show a different pattern of speed across item blocks. This paper attempts to model the response pattern of this subset of examinees and offers a possible explanation for this pattern of responses. This research explores the speeded behavior of a special subset of examinees. Identify if subpopulations have different methods of speed (e.g. increase as time goes on; slow down as time goes on). Identify if the membership to a subpopulation has an impact on the total score (i.e validity).

METHODS: Apply latent class analysis methods to longitudinal response data to identify subpopulations of different response behaviors. Medical licensure examinees taking one form of the COMLEX-USA Level 3 examination (n=543) were used to estimate the response time across item blocks. Examinees were served 8 item blocks. This study uses the first 7 blocks of 50 items each for analysis. A subset of examinees (30%) that show a different response pattern than the general population exhibits a different outcome of their final results. This indicates that examinees taking the final licensure examination to practice unsupervised medicine have developed skills and techniques (test savviness) that allows them to approach the examination in ways that are most comfortable to each examinee and attain an equivalent score.

RESULTS: Results indicate that a subset of the population exhibits a different response pattern than the general population. Membership in these latent classes did not impact examination performance.

CONCLUSIONS: Although two interesting classes emerged from the response dataset, the COMLEX examination offered enough time within each block of items for examinees to comfortably respond. The two classes, pacers and speeders, did not show any significant differences in the outcome of their final results. This indicates that examinees taking the final licensure examination to practice unsupervised medicine have developed skills and techniques (test savviness) that allows them to approach the examination in ways that are most comfortable to each examinee and attain an equivalent score.

MEASURES

Data. Data came from 534 resident test takers who are in their third year of residency. Residents have to take this examination in order to be fully licensed and be allowed to safely practice medicine. Eligible test takers were at least 18 years of age, had passed both COMLEX-USA Level-1 and COMLEX-USA Level-2. In addition, they had to be in good standing in their participating resident programs.

Examinees answered 8 blocks of items over the course of 8 hours with a lunch break in between. Within each block, 50 items were randomly delivered; each examinee received the same 50 items in random order. Because items were randomly delivered within each block, the total response time of the block was taken instead of the response time at the item level. On average, examinees took 55 minutes to respond to each block of items with the last block taking 51 minutes. The first four blocks were used for analysis.

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SUMMARY & CONCLUSION

• Two distinct classes of response times emerged.
• Pacers took 55 minutes per block to answer all items.
• Speeders averaged 44 minutes per block.
• Both had a negative regression slope, meaning as examinees progressed through item blocks, they spent significantly less time answering items.
• Difference between pacers and speeders was ~ 4 seconds.
• Group differences did not impact the final raw score.