

GMAT Psychometrics

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Topics

- Test Scores and Test Equating
- GMAT Percentile Rankings
- Computer Adaptive Tests and Test Preparation
- Scoring Computer Adaptive Tests (Q and V)
- GMAT Validity
- Common GMAT Myths

Test Scores and Test Equating

How do we make test scores from different test questions(CAT) comparable?

- GMAT Q and V are adaptive tests
 - Tests are tailored to the ability of examinees
 - Some receive harder tests than others
 - Score comparable?

 Normalize the scores by day, week, month.

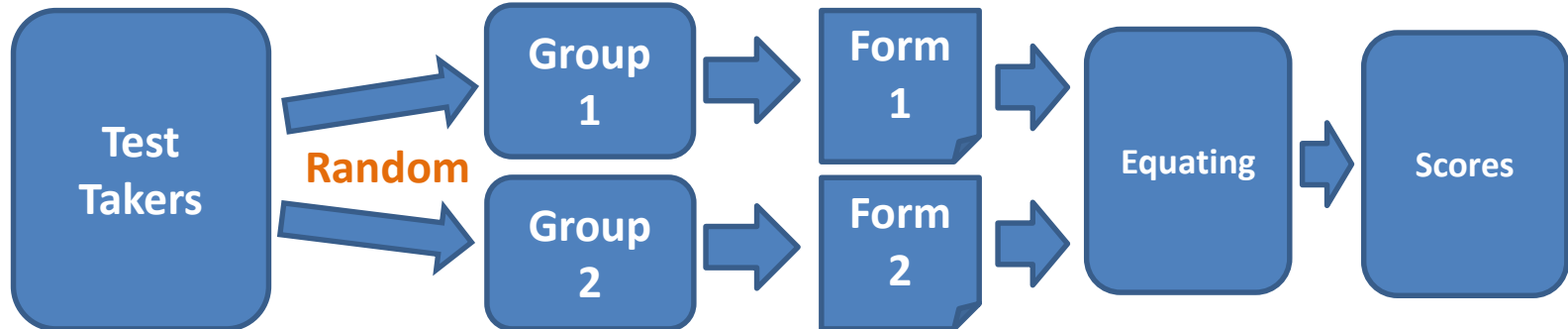
- Test equating

One fixed form in one administration

- Everyone takes the same set of questions
- Scores could be
 - number of right answers
 - % right of right answers
 - Formula scoring with penalty for wrong answers
 - ...
- All scores are all on the same scale
 - e.g. number right is on a scale of 0 to # of questions

Two fixed forms in one administration

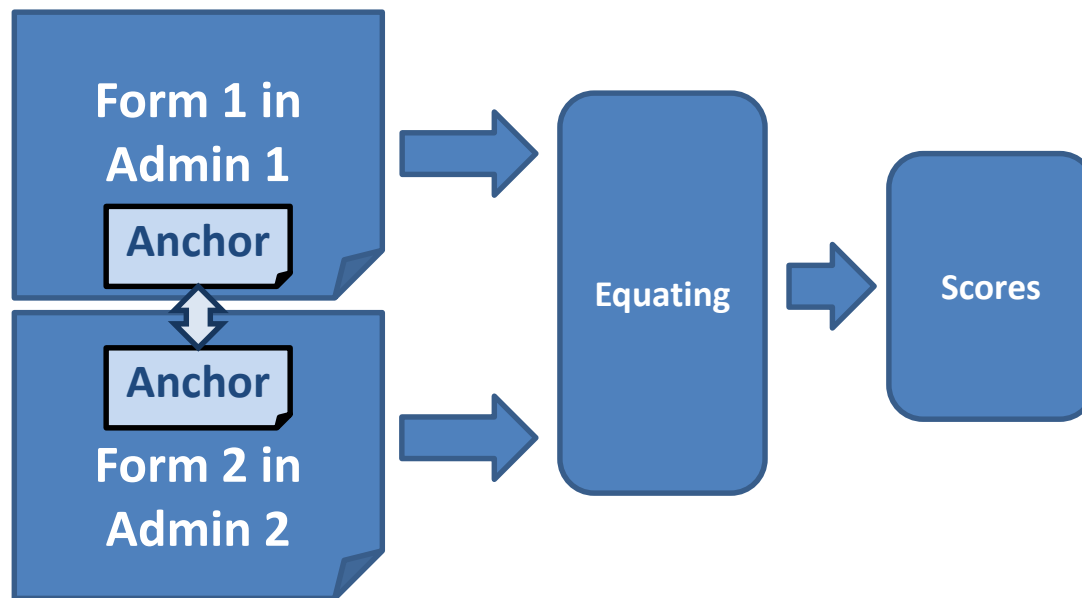
- Random equivalent groups



- Statistically adjust the difference in scores of the two groups (mean, standard deviation...)

Two administrations with one fixed form each

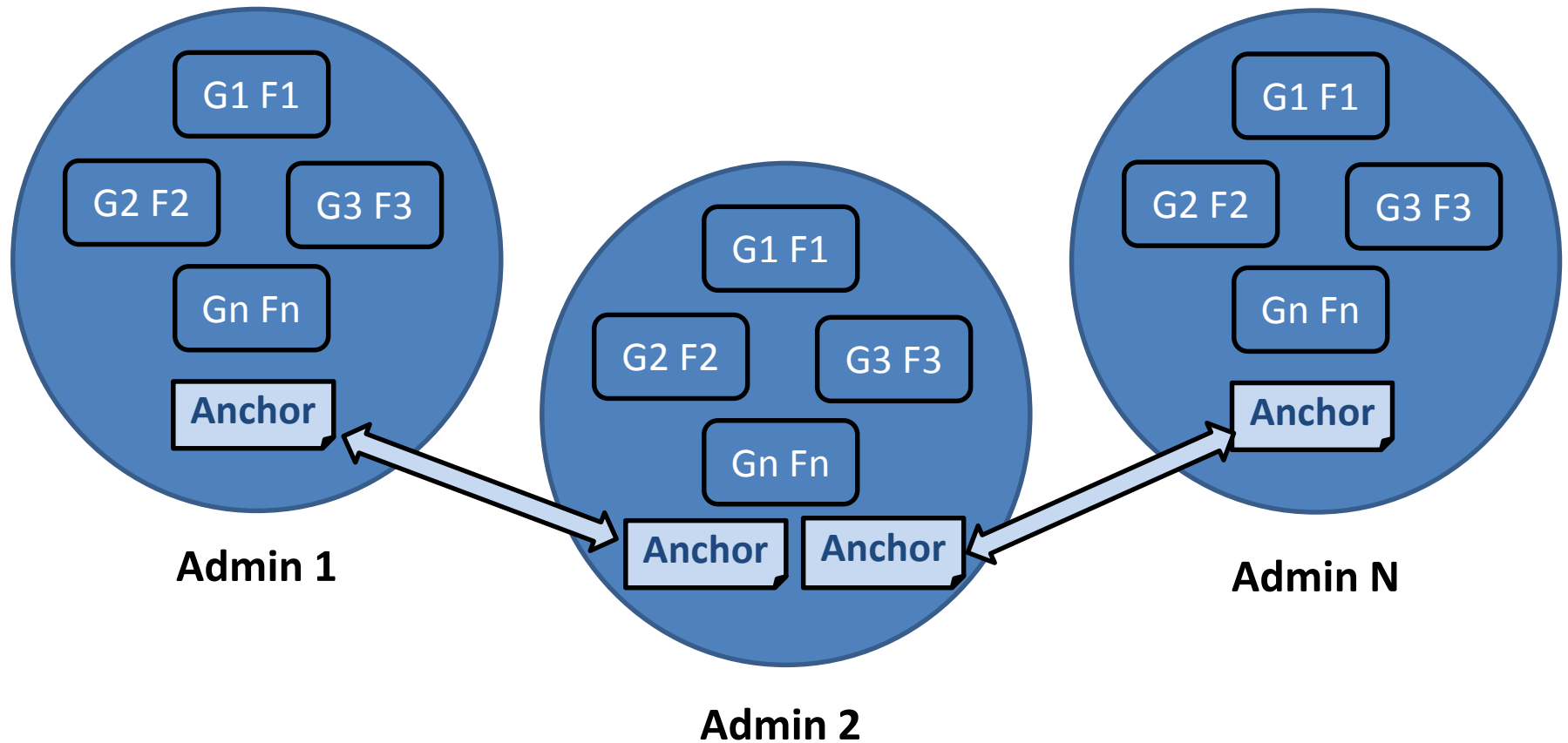
- Many equating methods (Anchor test design as an example)



- Statistically adjust the score differences of the main forms based on the anchor test.

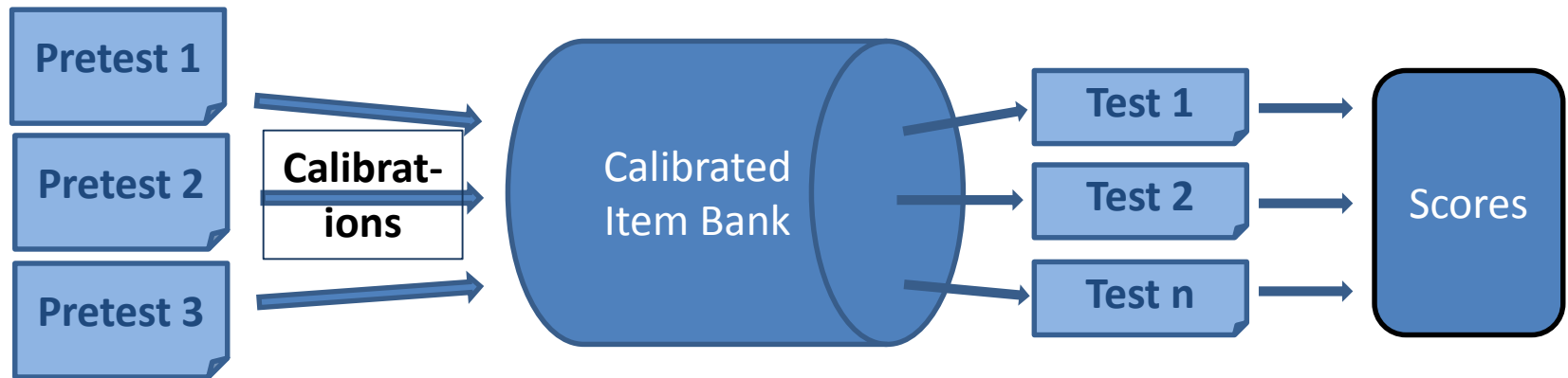
Multiple administrations each with multiple fixed forms

- Random equivalent groups and anchor tests



Computer adaptive test (GMAT Q and V)

- Item banks with known item statistics (calibrated)



- Item response theory and scoring tests

Computer adaptive test (GMAT Q and V)

- Item response theory (IRT)
 - Known item statistics -> scores
 - Examinees' responses to new items -> item statistics of new items
- That is why we are ready to have your scores as soon as you finished the test.

GMAT Percentile Rankings

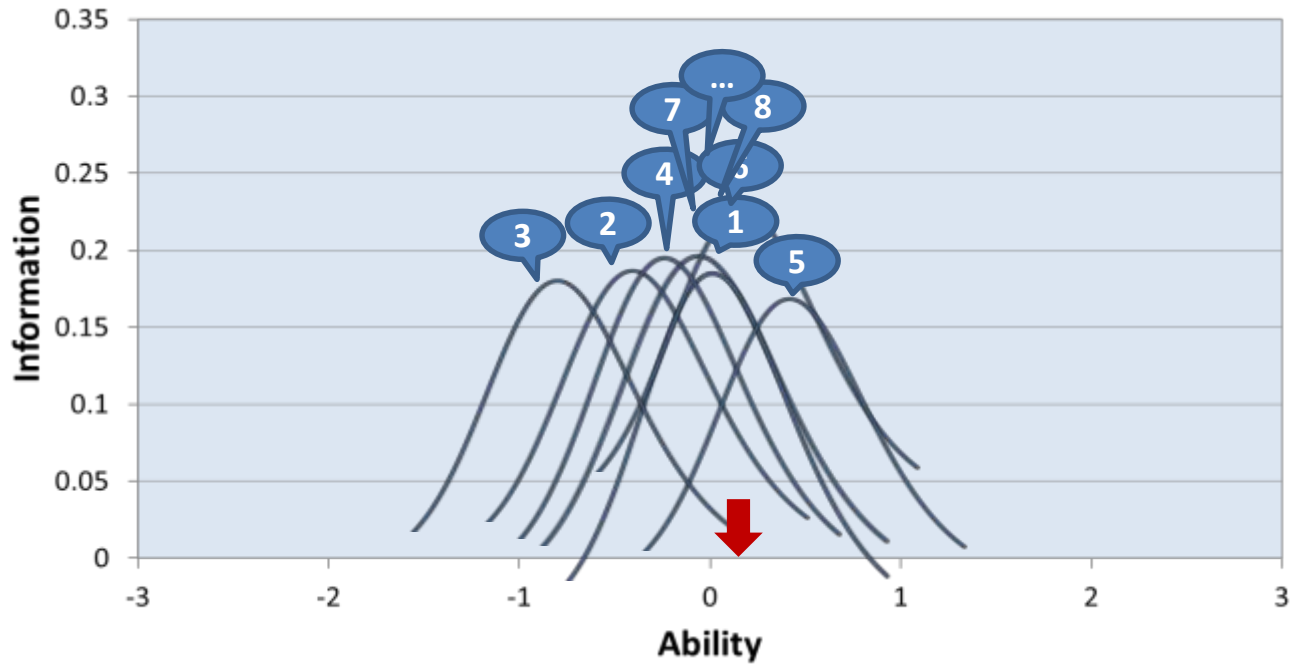
Calculation of GMAT “percentile ranking”

Score	n	Cumulative n	Cumulative %	Percent below
8	22	344	100.0%	93.6%
7	34	322	93.6%	83.7%
6	52	288	83.7%	68.6%
5	65	236	68.6%	49.7%
4	69	171	49.7%	29.7%
3	50	102	29.7%	15.1%
2	31	52	15.1%	6.1%
1	21	21	6.1%	0.0%
Total=	344			

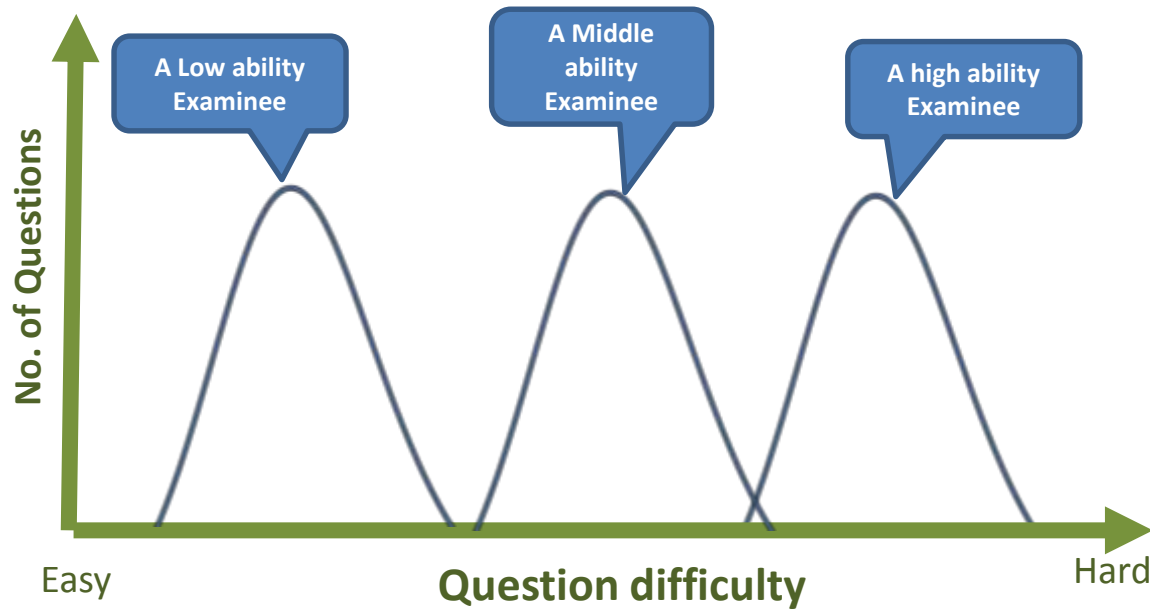


Computer Adaptive Tests and Test Preparation

Adaptive Testing



Implications to test preparations



Practice questions with difficulties appropriate for you !!!

Assemble Your Own Practice Exams



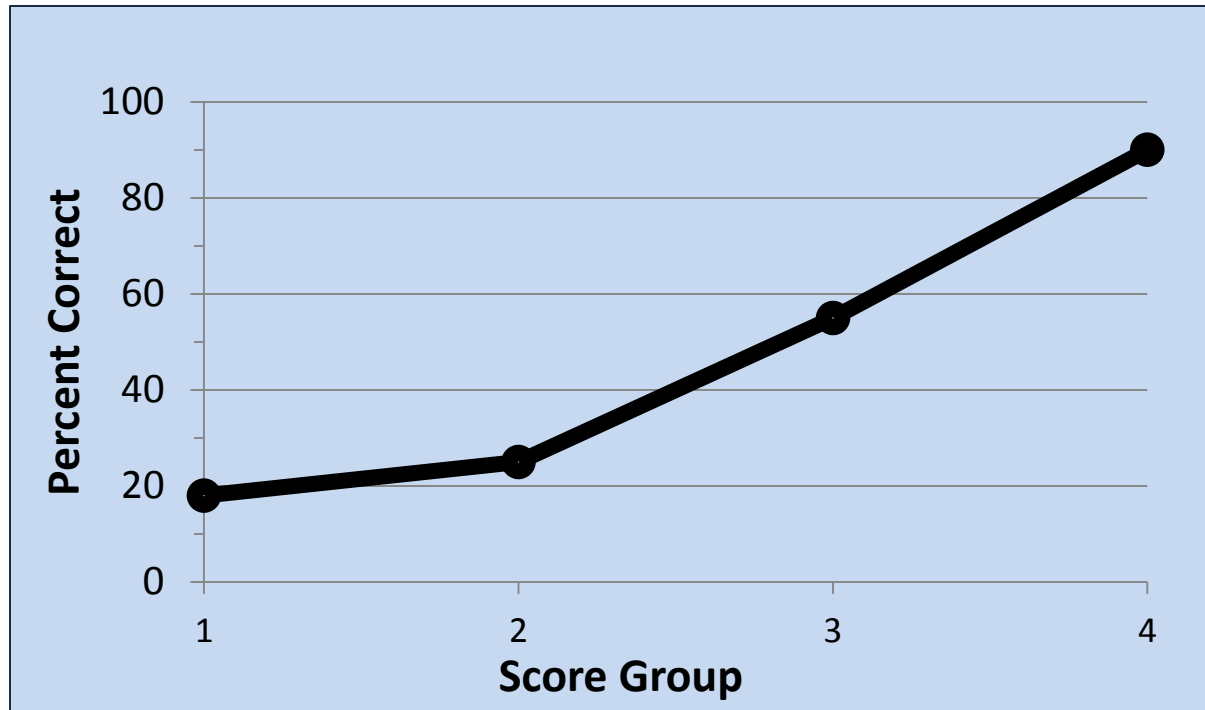
- Know your ability
- Practice with questions most appropriate for you
- Add some questions more difficult than your ability
- Do NOT practice on the most difficult questions only

Scoring Computer Adaptive Tests (GMAT Q and V)

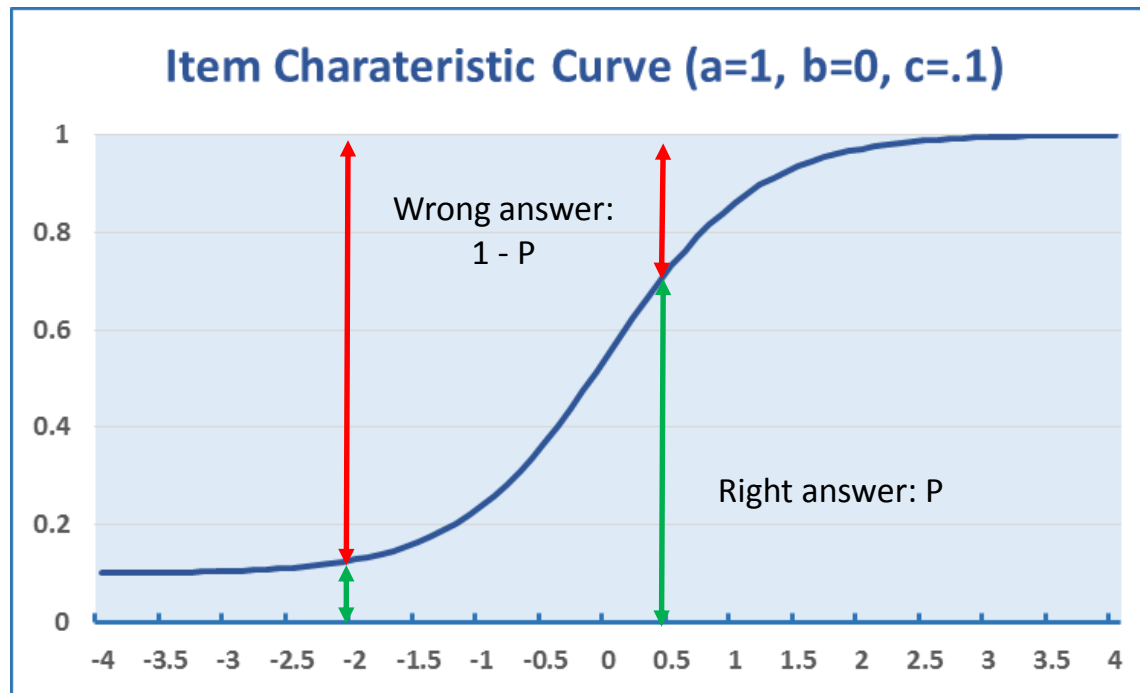
Conditional probability of a right answer

	G1	G2	G3	G4
N	50	80	91	40
Right	9	20	50	36
Percent	18%	25%	55%	90%

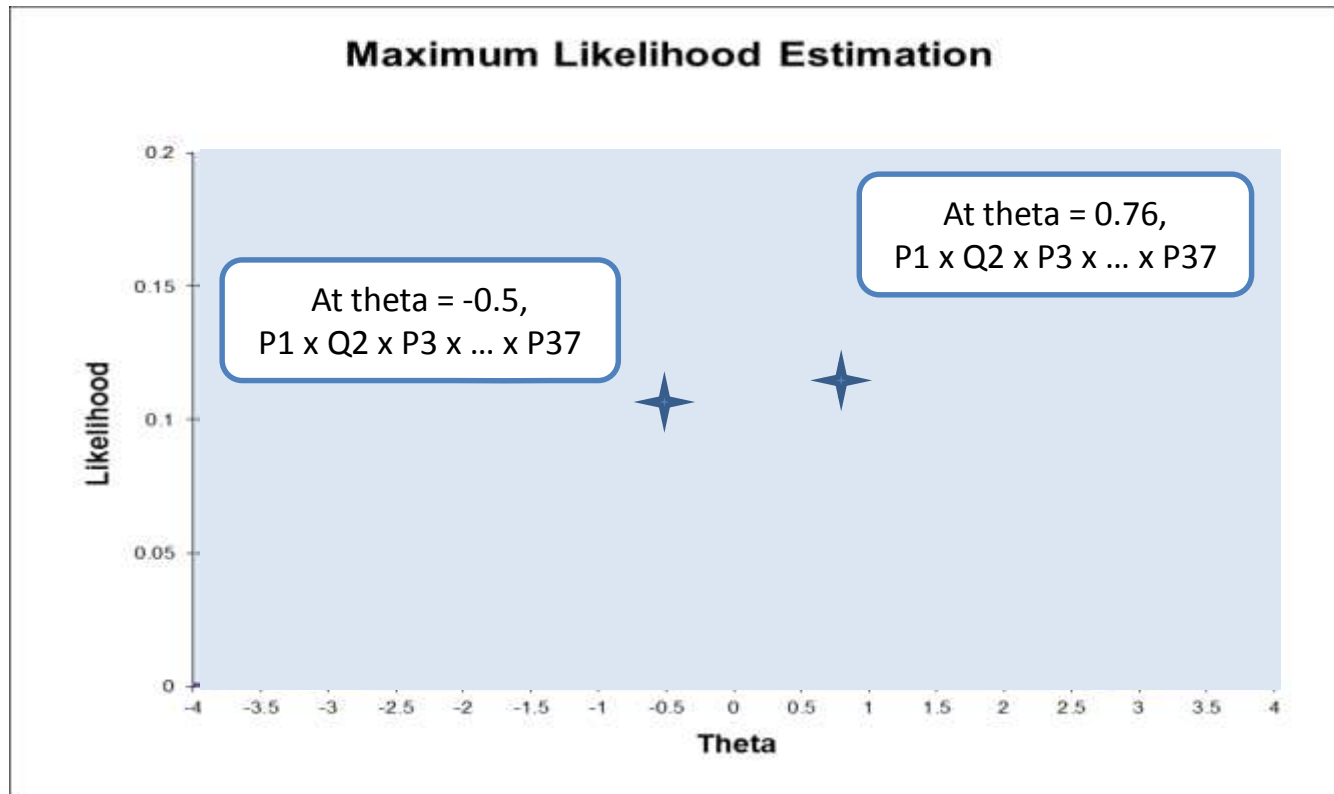
Response function



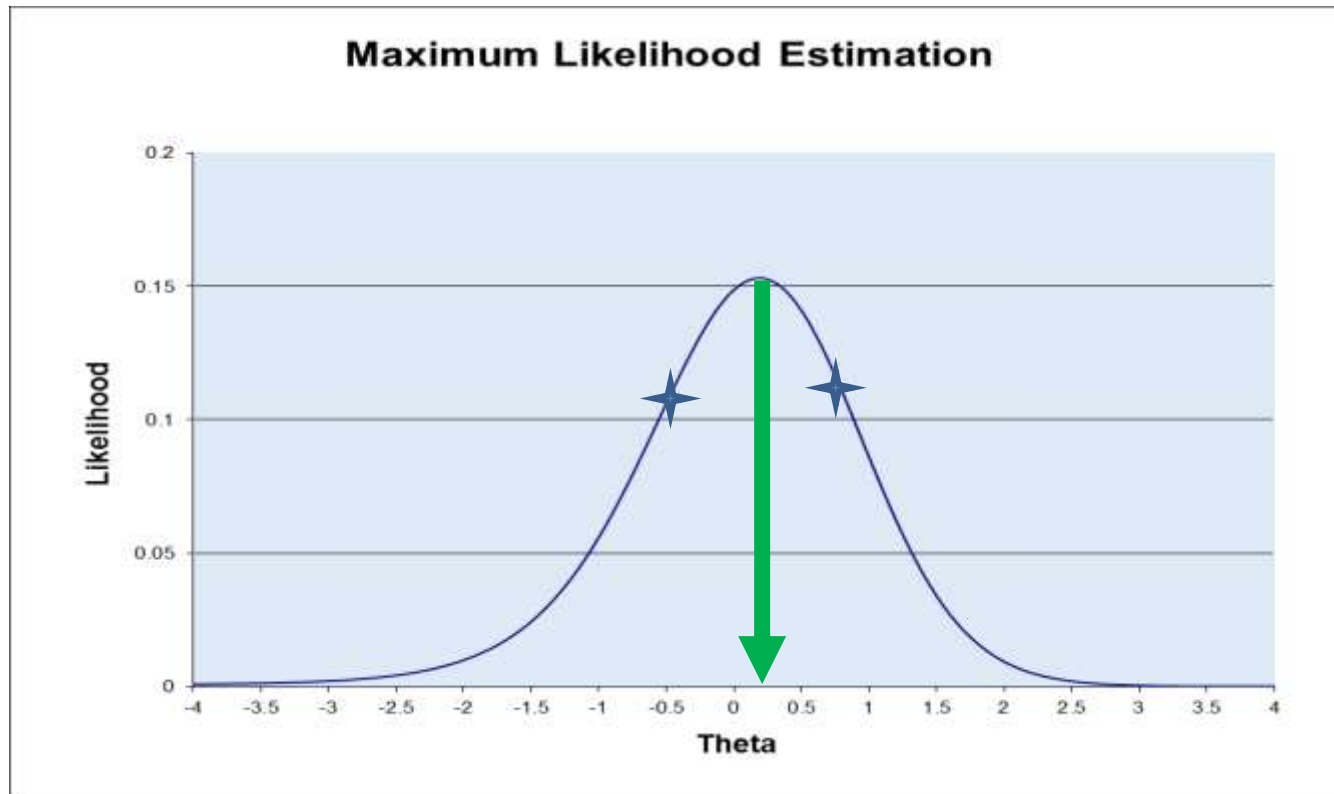
Scoring a CAT test



Scoring a CAT test



Scoring a CAT test



From theta to scaled score

- Quantitative and Verbal
 - Theta converted to the old paper-and-pencil equated raw score
 - Raw to scaled score
- Total
 - Sum of Q and V equated raw scores to scaled Total (200 – 800)

What if you do not finish the test?

You will not get the points for the questions you did not answer



- You answered 2/3 of the questions all correctly
- You did not answer the other 1/3
- The highest score you could get is
2/3 of the perfect score

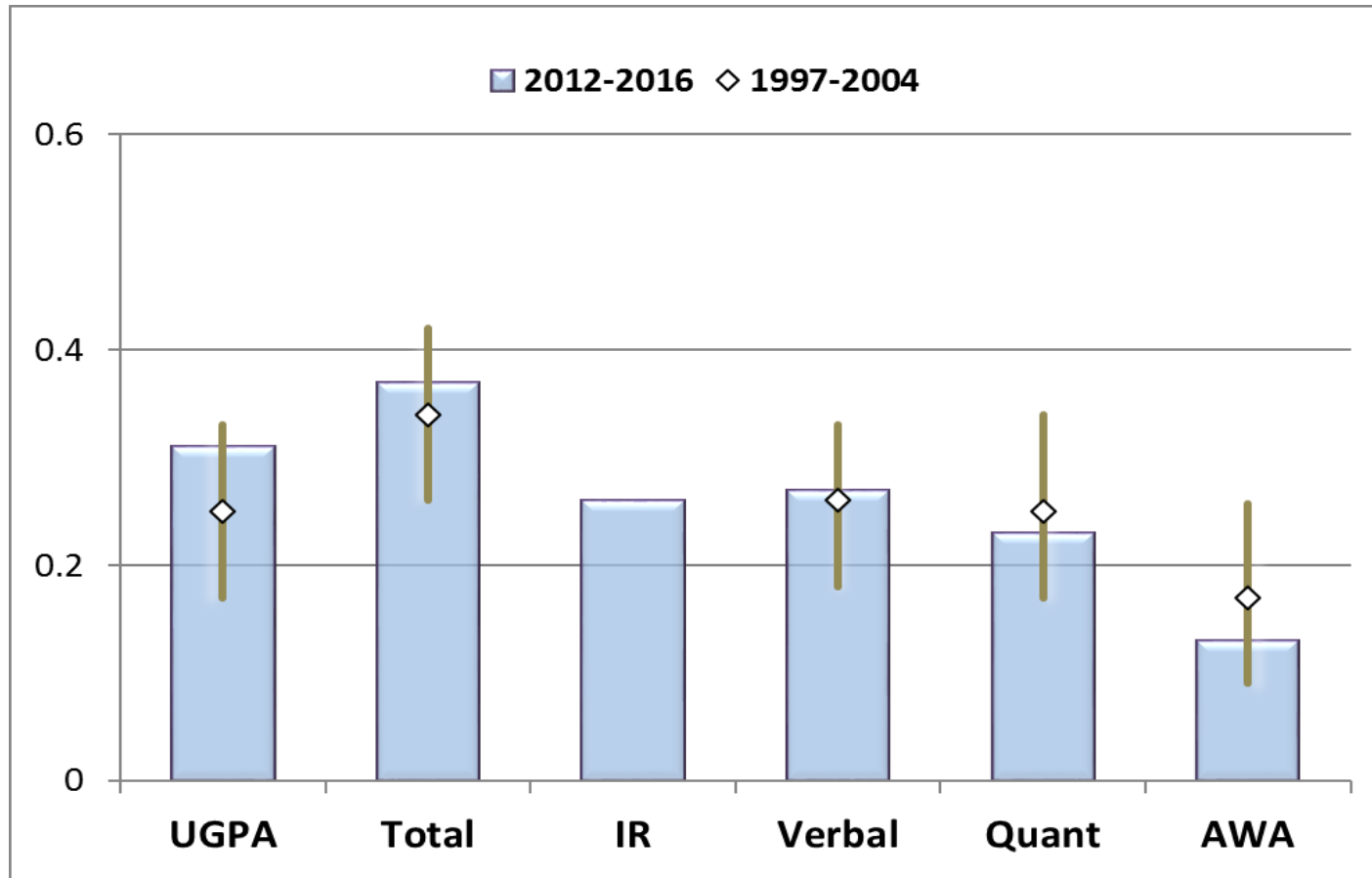
Critical Facts



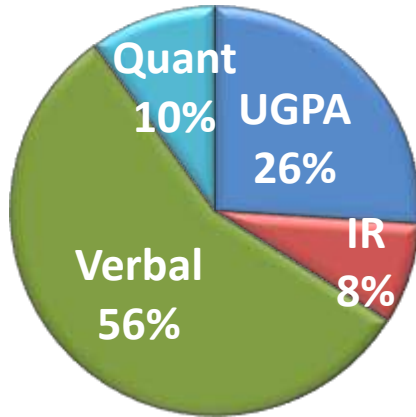
- Percent or number correct do not apply here
- Your test is tailored to your ability
- Every item counts in scoring
- Adaptive testing is self correcting
- Pre-knowing item answers might NOT increase your scores

GMAT Validity

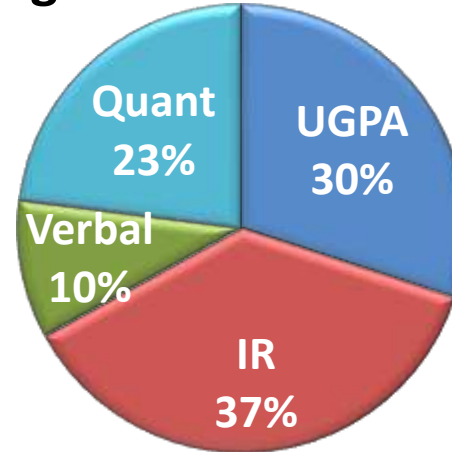
GMAT validity Coefficients



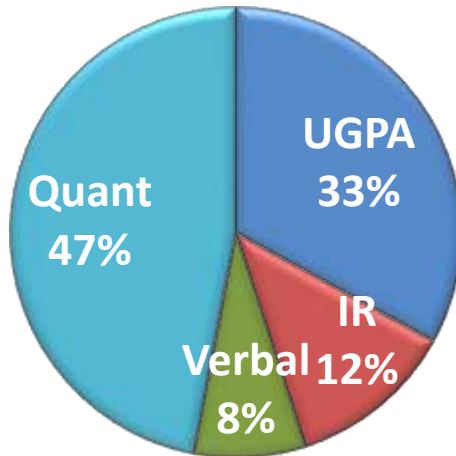
Program A



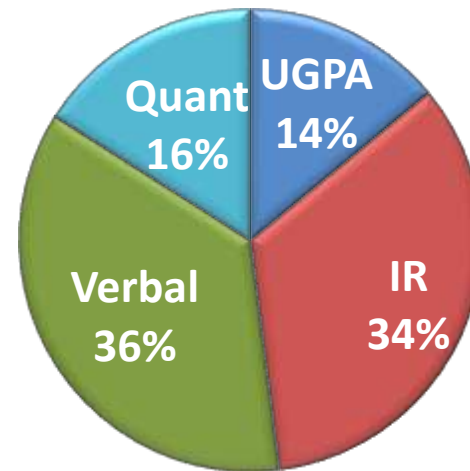
Program B



Program C



Program D

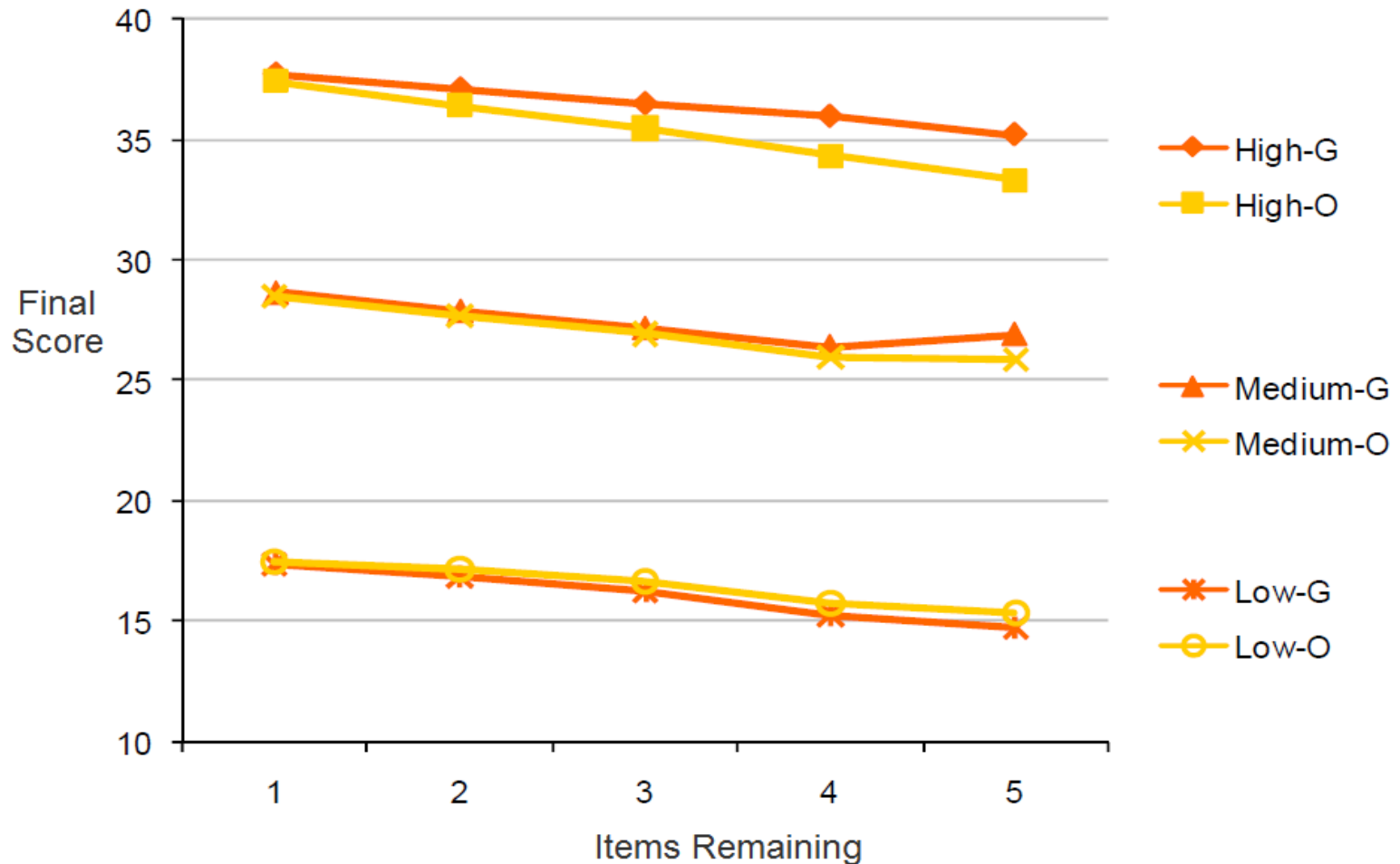


Common GMAT Myths

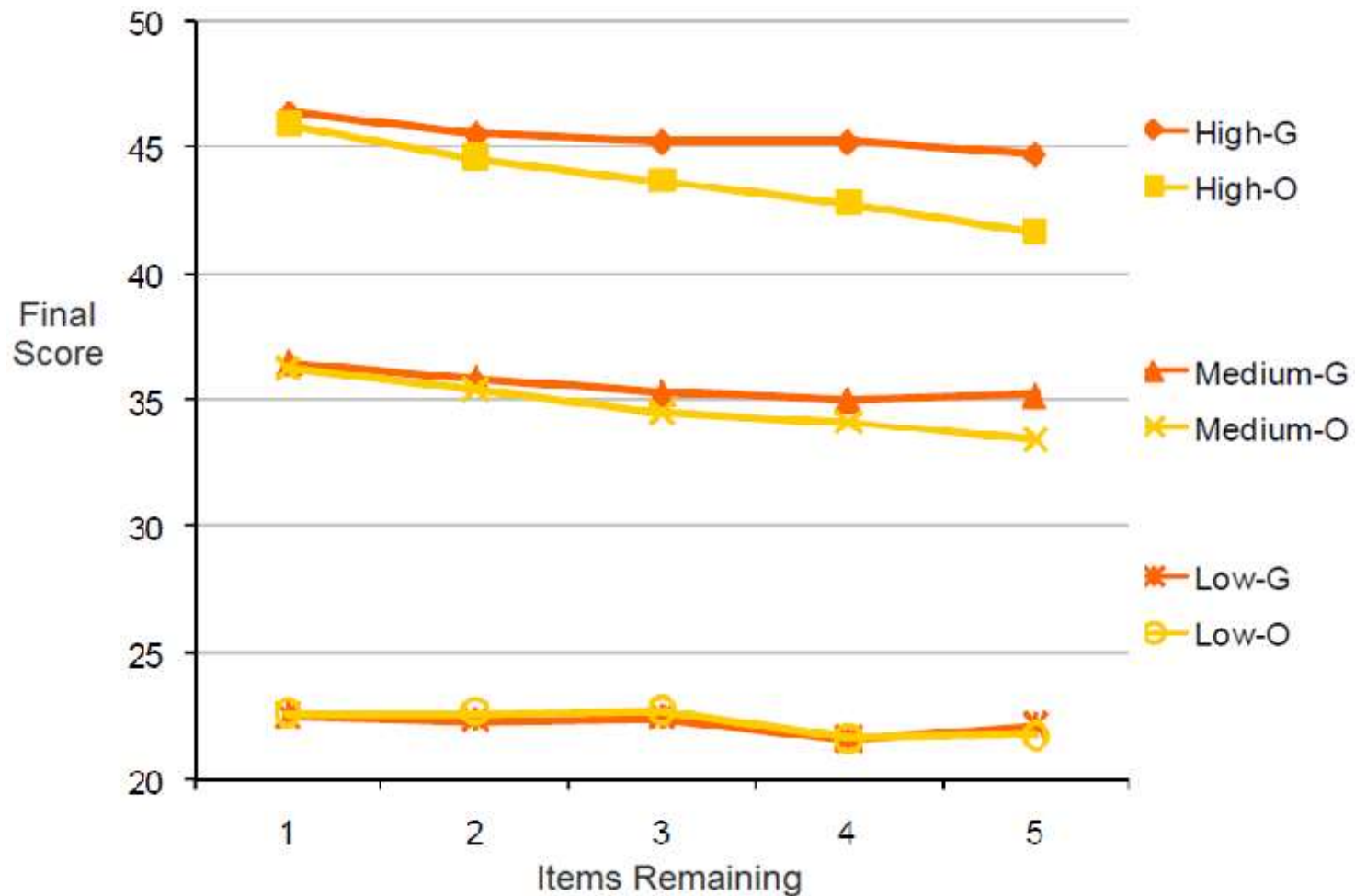
What do I do if I am running out of time?

Guess Blindly or Omit?

Effect on Average Verbal Scores by Items Remaining, Ability Group and Strategy

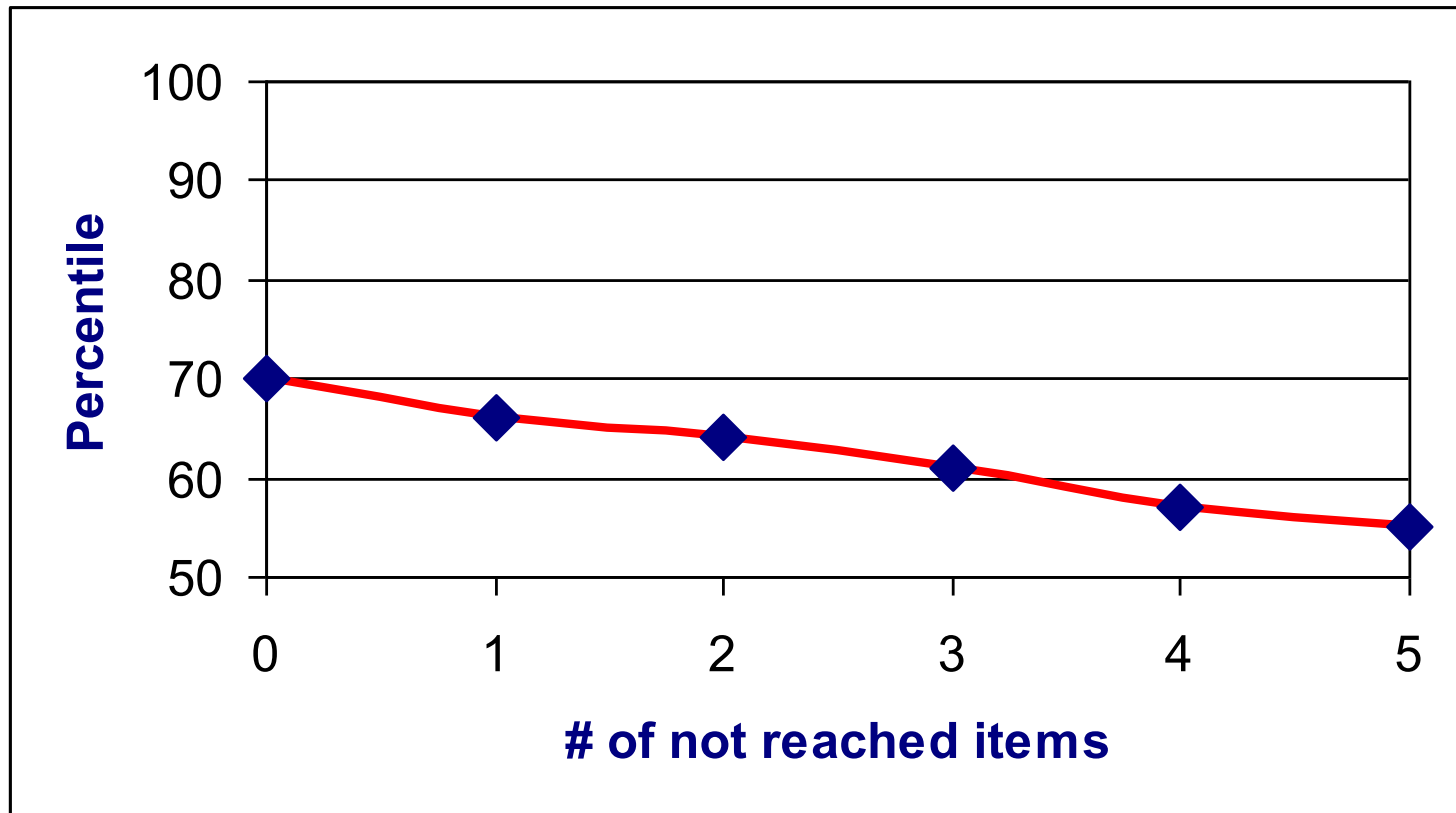


Effect on Average Quantitative Scores by Items Remaining, Ability Group and Strategy



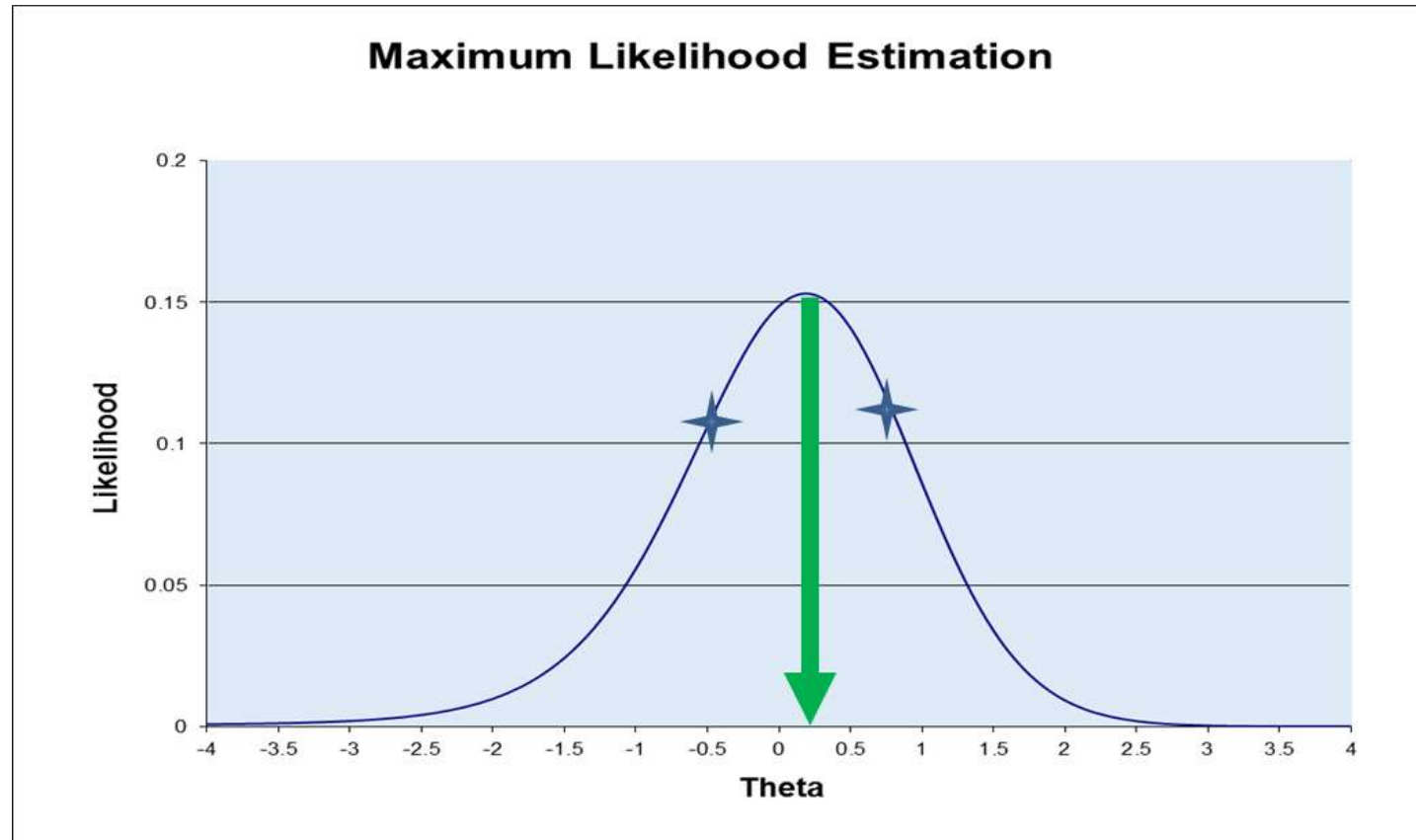
Myth: It is more important to respond correctly than it is to finish

Fact: There is a penalty for not completing all items on the GMAT® test.



Myth: The first 10 questions are critical, you should invest the most time on those items

Fact: All questions count



Other Myths

Myth

- Studying vocabulary lists will help you get a better score
- An easier item means I got the previous item wrong
- You need a super high score to get into a top school
- You need very advanced math skills to do well on the GMAT® exam

Fact

- There are no analogies on the GMAT® exam
- Item difficulty can change with content change
- Schools try to find students who best fit their programs
- The math skills tested are quite basic but require application of skills

Questions?

