# Examining Distractor Effectiveness In Modified Items for Students with Disabilities

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# Taking Distractors Lightly

- Distractors tend to be fillers, to occupy the other three or four options.
- Distractors are sometimes absurd or even humorous.
- “It’s hard to write 3 or 4 good distractors!”

# From Distractors to Attractors

- Attractors contribute to the overall quality of the item and test.
- Attractors play a central role in determining the difficulty of an item.
- Attractors are explicitly designed to inform us about prevailing misconceptions and errors.

# To be Consistent

We are compiling evidence from our own work and the work of others regarding the utility of being direct and explicit in our item writing, relying on good item writing guidelines, elements of Universal Design, concepts from Cognitive Load Theory, and research based on language complexity and accessibility for diverse students.

**TAMI** provides a systematic guide.

# Effects of Item Modification

- Item Difficulty
- Item Discrimination
- IRT Item location and Item Fit
- Distractor (Attractor) Functioning
  - Proportion selecting the distractor
  - Point-biserial correlation (distractor-total *r*)
  - DDF
  - Qualitative Evidence

**2.** Which stem-and-leaf best represents the data listed below?

12, 15, 17, 17, 22, 22, 23, 24, 25, 27, 28, 28, 31, 31, 38, 43, 44, 44, 47, 49

○ A.

| | |
|---|---|
| 1 | 2 |
| 2 | 2 |
| 3 | 1 |
| 4 | 3 |

○ B.

| | |
|---|---|
| 1 | 2, 5, 7, 7 |
| 2 | 2, 2, 3, 4, 5, 7, 8, 8 |
| 3 | 1, 1, 8 |
| 4 | 3, 4, 4, 7, 9 |

○ C.

| | |
|---|---|
| 1 | 2, 5, 7 |
| 2 | 2, 3, 4, 5, 7, 8 |
| 3 | 1, 8 |
| 4 | 3, 4, 7, 9 |

○ D.

| | |
|---|---|
| 1 | 12 |
| 2 | 22 |
| 3 | 31 |
| 4 | 43 |

**2.** Consider the following data:

12, 15, 17, 17, 22, 22, 23, 24, 25, 27, 28, 28, 31, 31, 38

Which stem-and-leaf best represents the data?

A.

| | |
|---|---|
| 1 | 2, 5, 7, 7 |
| 2 | 2, 2, 3, 4, 5, 7, 8, 8 |
| 3 | 1, 1, 8 |

B.

| | |
|---|---|
| 1 | 2, 5, 7 |
| 2 | 2, 3, 4, 5, 7, 8 |
| 3 | 1, 8 |

C.

| | |
|---|---|
| 1 | 12 |
| 2 | 22 |
| 3 | 31 |

**2.** Which stem-and-leaf best represents the data listed below?

12, 15, 17, 17, 22, 22, 23, 24, 25, 27, 28, 28, 31, 31, 38, 43, 44, 44, 47, 49

○ A.

| | |
|---|---|
| 1 | 2 |
| 2 | 2 |
| 3 | 1 |
| 4 | 3 |

○ B.

| | |
|---|---|
| 1 | 2, 5, 7, 7 |
| 2 | 2, 2, 3, 4, 5, 7, 8, 8 |
| 3 | 1, 1, 8 |
| 4 | 3, 4, 4, 7, 9 |

○ C.

| | |
|---|---|
| 1 | 2, 5, 7 |
| 2 | 2, 3, 4, 5, 7, 8 |
| 3 | 1, 8 |
| 4 | 3, 4, 7, 9 |

○ D.

| | |
|---|---|
| 1 | 12 |
| 2 | 22 |
| 3 | 31 |
| 4 | 43 |

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 10 | 4 | -0.17 |
| **B** | **161** | **69** | **0.38** |
| C | 36 | 16 | -0.23 |
| D | 25 | 11 | -0.18 |

**2.** Consider the following data:

12, 15, 17, 17, 22, 22, 23, 24, 25, 27, 28, 28, 31, 31, 38

Which stem-and-leaf best represents the data?

A.

| | |
|---|---|
| 1 | 2, 5, 7, 7 |
| 2 | 2, 2, 3, 4, 5, 7, 8, 8 |
| 3 | 1, 1, 8 |

B.

| | |
|---|---|
| 1 | 2, 5, 7 |
| 2 | 2, 3, 4, 5, 7, 8 |
| 3 | 1, 8 |

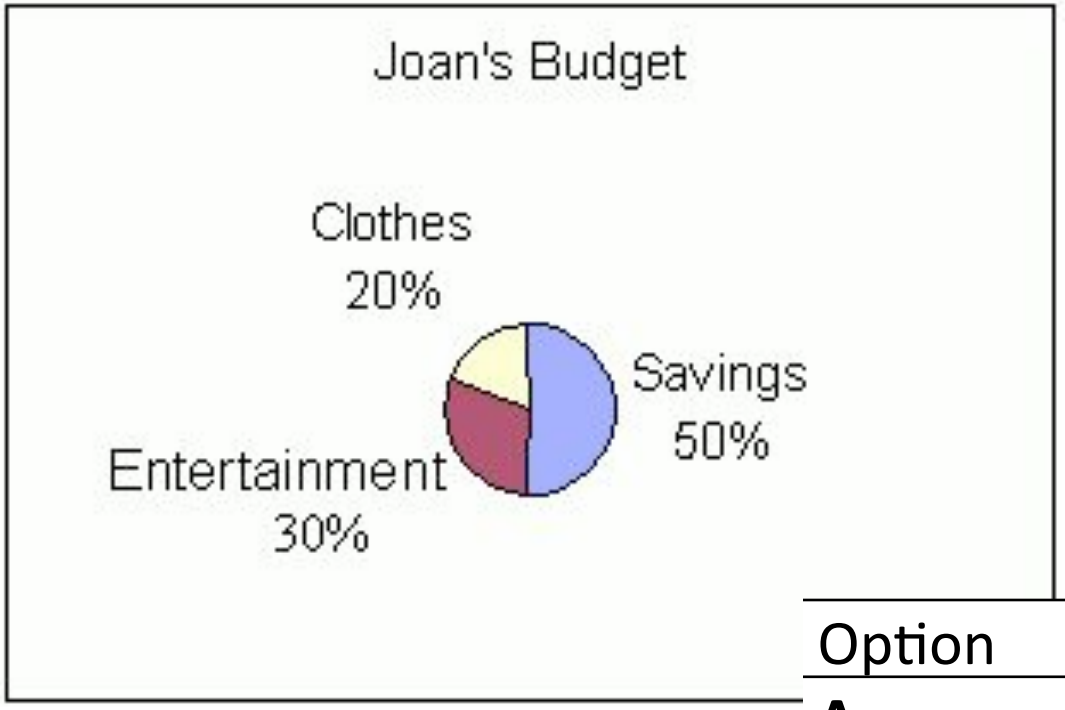
C.

| | |
|---|---|
| 1 | 12 |
| 2 | 22 |
| 3 | 31 |

| Option | N | % | Ptbs |
|---|---|---|---|
| **A [B]** | **323** | **68** | **0.40** |
| B [C] | 99 | 21 | -0.25 |
| C [D] | 53 | 11 | -0.27 |

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 10 | 4 | -0.17 |
| **B** | **161** | **69** | **0.38** |
| C | 36 | 16 | -0.23 |
| D | 25 | 11 | -0.18 |

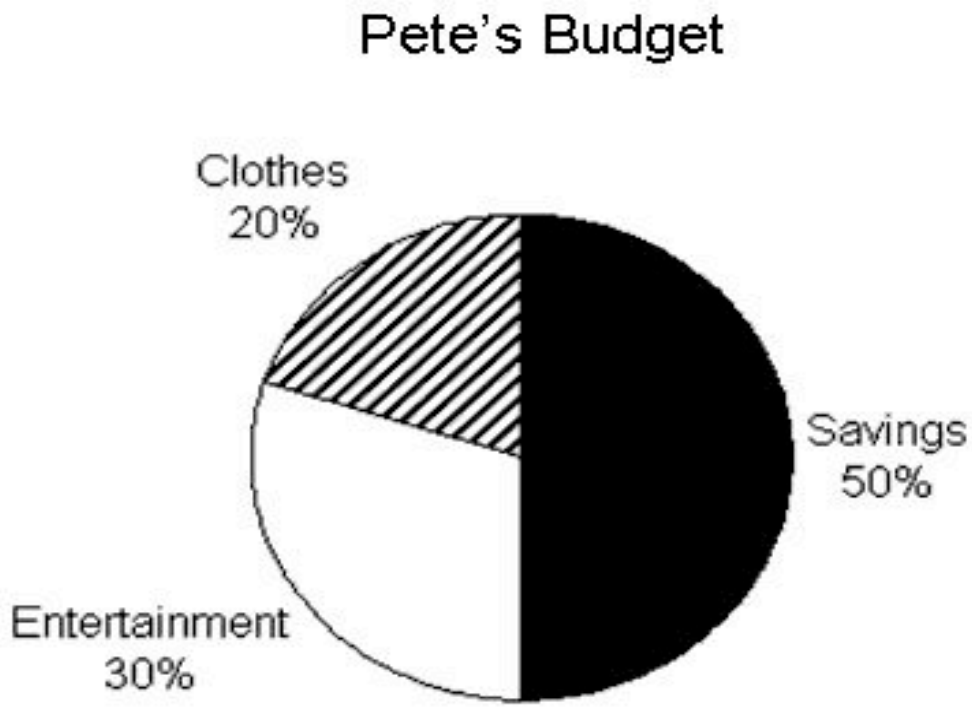
**4.** Joan earns $100 per month working part-time in a music store. Look at the pie chart that shows how Joan budgets her money each month. If Joan sticks to her budget, how much can she spend on clothes and entertainment each month?




- A. $50.00
- B. $40.00
- C. $30.00
- D. $20.00

| Option | N | % | Ptbs |
|---|---|---|---|
| **A** | **139** | **60** | **0.37** |
| B | 24 | 10 | -0.25 |
| C | 39 | 17 | -0.21 |
| D | 31 | 13 | -0.08 |

**4.** Pete earns $100 per month. Based on the graph, how much can he spend on clothes and entertainment each month?




- A. $50.00
- B. $30.00
- C. $20.00

| Option | N | % | Ptbs |
|---|---|---|---|
| **A** | **323** | **68** | **0.35** |
| B [C] | 88 | 19 | -0.34 |
| C [D] | 67 | 14 | -0.10 |

**17.** A bookstore sold some of its books for $3 per bag. If each bag contained 16 books and the bookstore made $453 from the sale, how would you determine the number of books that were sold?

- A. Divide 453 by 3 and then multiply by 16.
- B. Multiply 16 by 3 and then add 453.
- C. Multiply 453 by 3 and then divide by 16.
- D. Divide 453 by 16 and then multiply by 3.

| Option | N | % | Ptbs |
|---|---|---|---|
| **A** | **86** | **35** | **0.40** |
| B | 51 | 21 | -0.28 |
| C | 53 | 22 | -0.19 |
| D | 53 | 22 | 0.01 |

**17.**

A store sold books for $3 per bag. Each bag contained 16 books. The store made $453. How would you find the number of books that were sold?


- A. $(453 \div 3) \times 16$
- B. $(16 \times 3) + 453$
- C. $(453 \times 3) \div 16$

| Option | N | % | Ptbs |
|---|---|---|---|
| **A** | **246** | **53** | **0.47** |
| B | 107 | 23 | -0.41 |
| C | 112 | 24 | -0.14 |

**4.** From whose point of view is this passage written?

- A. Jeff's
- B. the flight attendant's
- C. the pilot's
- D. the nephew's

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 58 | 24 | -0.27 |
| *B* | *24* | *10* | *-0.37* |
| C | 21 | 9 | -0.23 |
| **D** | **136** | **57** | **0.59** |

**4.** From whose point of view is this passage written?

- A. the uncle's
- B. the pilot's
- C. the child's

| Option | N | % | Ptbs |
|---|---|---|---|
| A [A] | 46 | 10 | -0.46 |
| B [C] | 35 | 8 | -0.36 |
| **C [D]** | **377** | **82** | **0.61** |

**19.** Some archaeologists do **not** believe the Egyptians used ramps to build the Great Pyramid because _____.

- A. there was not any material to construct the ramps
- B. no evidence of ramps has been discovered
- C. there was no need to use ramps
- D. they had no knowledge of how to build ramps

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 66 | 30 | -0.22 |
| **B** | **111** | **50** | **0.49** |
| C | 22 | 10 | -0.25 |
| D | 24 | 11 | -0.24 |

**19.** According to the passage, why do some archaeologists **NOT** believe the Egyptians used ramps to build the Great Pyramid?.

- A. No evidence of ramps has been discovered.
- B. There was no need to use ramps.
- C. Egyptians did not know how to build ramps.

| Option | N | % | Ptbs |
|---|---|---|---|
| **A [B]** | **349** | **74** | **0.61** |
| B [C] | 67 | 14 | -0.42 |
| C [D] | 57 | 12 | -0.38 |

**22.** What is the definition of minute when it is pronounced (mī-nōōt)?

- A. a measure of time
- B. larger than most
- C. tiny
- D. energetic

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 131 | 58 | -0.31 |
| B | 30 | 13 | -0.10 |
| **C** | **53** | **24** | **0.48** |
| *D* | *10* | *4* | *-0.07* |

**Read the following sentence and then answer the question about what the word in bold print means.**

**22.** The backyard was **minute**.

What does **minute** mean when it is pronounced (mī-nōōt)?

- A. a measure of time
- B. larger than most
- C. very small

| Option | N | % | Ptbs |
|---|---|---|---|
| A [A] | 123 | 26 | -0.38 |
| B [B] | 85 | 18 | -0.23 |
| **C [C]** | **265** | **56** | **0.51** |

**27.** "Do not desert me in my hour of need."

In the phrase above, the underlined word is stressed on the second syllable. What would the word mean if the stress were on the first syllable instead of the second?

- A. a sweet type of food
- B. to be left alone
- C. a place of little rainfall
- D. undeserving

| Option | N | % | Ptbs |
|---|---|---|---|
| A | 85 | 38 | 0.23 |
| B | 69 | 31 | -0.26 |
| **C** | **40** | **18** | **0.21** |
| D | 30 | 13 | -0.21 |

**Read the following sentence and then answer the question about what the word in bold print means.**

**27.** "Do not **desert** me in my hour of need."

In the sentence above, **desert** is stressed on the second syllable. What does **desert** mean when the stress is on the first syllable instead of the second?

- A. a sweet type of food
- B. to be left alone
- C. a place of little rainfall

| Option | N | % | Ptbs |
|---|---|---|---|
| A [A] | 111 | 24 | -0.03 |
| B [B] | 272 | 58 | -0.03 |
| **C [C]** | 89 | 19 | 0.07 |

# Attractors are Explicitly Intentional

- What makes this option an attractor?
- Is this an effective attractor?
- How many attractors are needed?
- How can we improve the effectiveness of the item attractors?
- Does a focus on attractors rather than distractors matter? Does it help us make items and tests more widely accessible?

# Future Directions