

# Effectively Communicating Survey Data: Beyond Text Tables and Pie Charts

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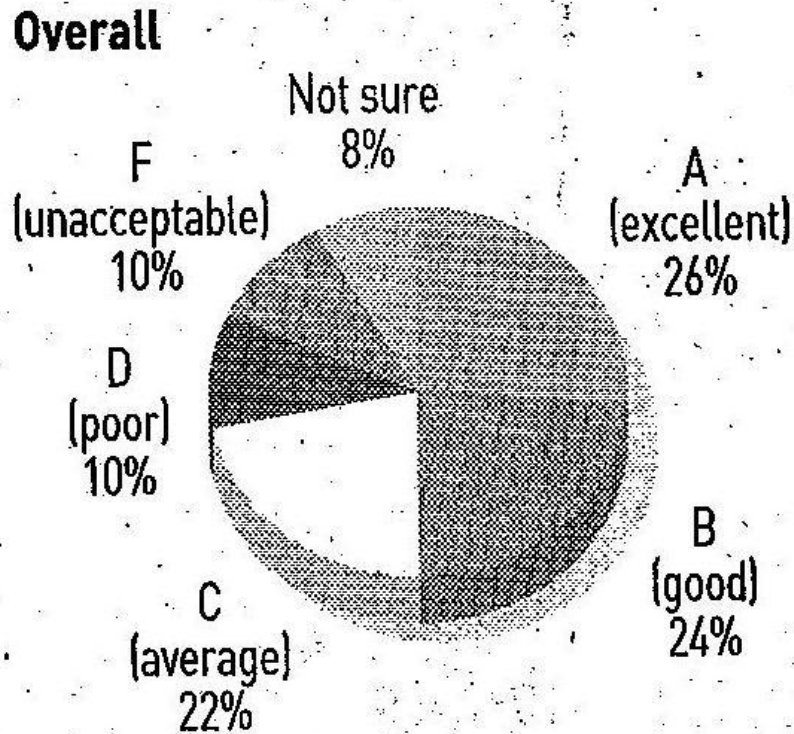
# Effectively Communicating Survey Data: Beyond Text Tables and Pie Charts

- Topic: Obama Terrorism Grade Poll
  - Original Research by: Technometrica Market Intelligence
  - 926 adults surveyed, March 31<sup>st</sup> – April 5<sup>th</sup>
  - Source: [Investors Business Daily](#)
    - April 27th, 2009
    - Page A15 (unable to locate on web)
  - IBD is one of my favorite investment resources
  - Of the many national newspapers, I would consider IBD in the “conservative” newspaper category

# Obama Terrorism Grade Survey

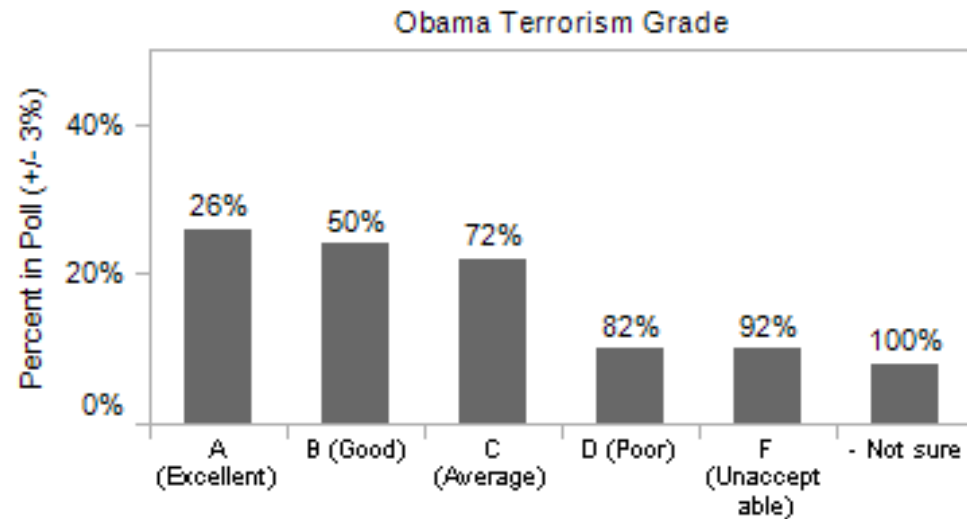
- Results are summarized three ways in the article
  - Overall for all respondents
  - By political party
  - By ideology
- Two presentation methods are used
  - Pie chart
  - Two text tables
- Cited margin of error for sample is +/- 3.3%

# Overall Terrorism Grade Pie Chart- Original



- IBD overall grade pie chart
  - The pie chart is quite busy
  - It is easy to see that A and B grades are approximately half the respondents
  - It's difficult to contrast this data with the text tables that follow
    - By party and ideology

# Recommended View- Overall Terrorism Grade



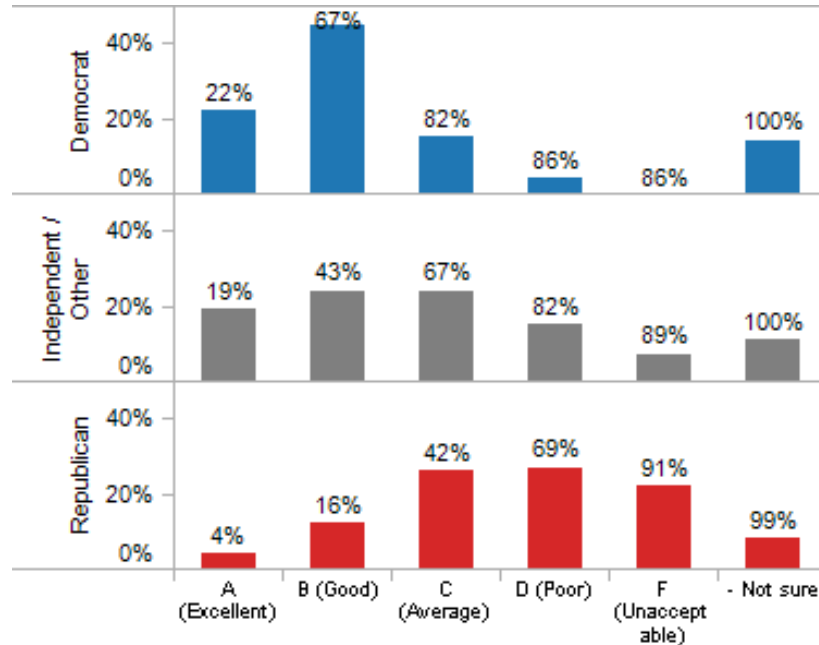
- Replace the pie chart with a bar chart
  - Much cleaner look
  - Added running total percentages from left to right
    - Since the grade encoding has ordinal meaning from left to right, this is a useful addition
- Note that it is much easier to compare the ratio of each grade in the bar chart than in the pie chart
  - A is bigger than B
    - However, the difference isn't bigger than the margin of error
  - It is well documented that humans can interpret bar sizes faster and easier than pie slices

# IBD Party Survey Results Text Table

		A (excellent)	B (good)	C (average)	D (poor)	F (unacceptable)	Not sure
<b>By party</b>	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
	Ind./other	19%	24%	24%	15%	7%	11%
<b>By ideology</b>	Conservative	7%	17%	24%	23%	17%	12%
	Moderate	13%	43%	22%	5%	5%	12%
	Liberal	36%	28%	18%	3%	1%	13%

- Note that the text table masks the shape of grades
  - For example, it is difficult to see that 82%, 67%, and 42% of the three parties give Obama passing grades of C or better
- It is difficult to understand the distribution of grades

# Recommended View- Party Survey Results

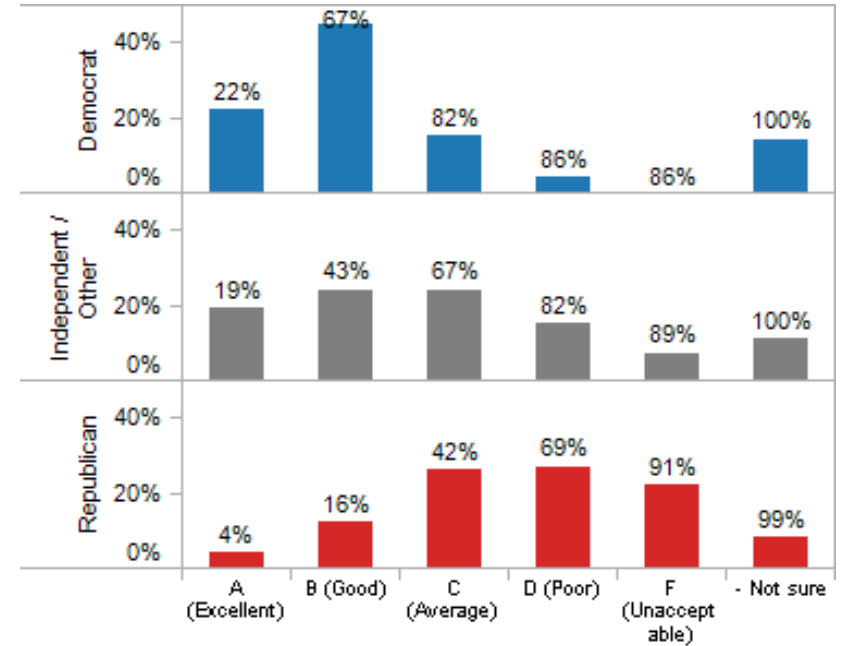


- Recommend revising data presentation as an aligned bar chart
  - Democrats peak at B's, Independents at B/C, and Republicans at D's
  - With aligned bars, it is easy to see that the Independent and Republican distributions are similar in shape, just centered differently
  - Democrats have a higher consensus (peak or mode) than the other two groups
  - It is also easy to see the median for each group- B, C, and D respectively

# Contrast of Party Survey Results Views

		A (excellent)	B (good)	C (average)	D (poor)	F (unacceptable)	Not sure
<b>By party</b>	Democrats	22%	45%	15%	4%	0%	14%
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Original



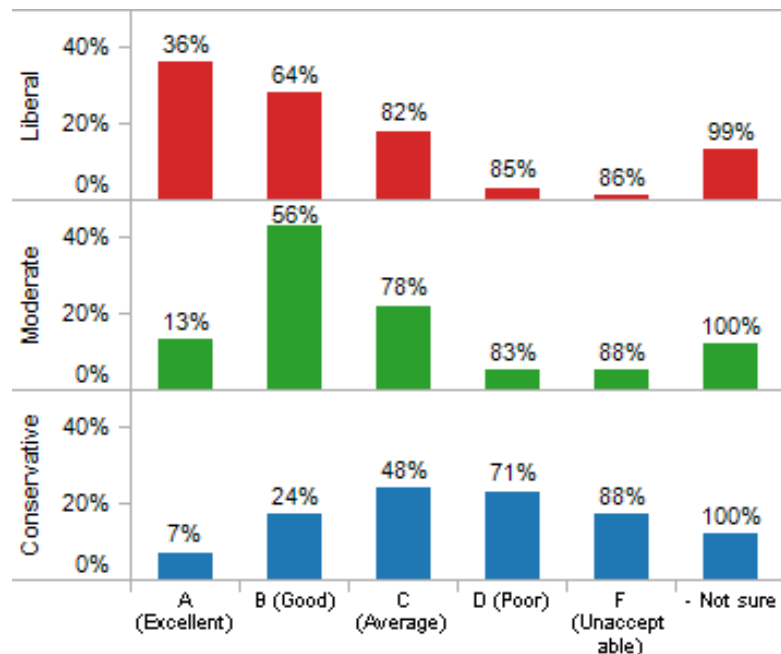
Recommended

# IBD Ideology Survey Results Text Table

		A (excellent)	B (good)	C (average)	D (poor)	F (unacceptable)	Not sure
<b>By party</b>	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
	Ind./other	19%	24%	24%	15%	7%	11%
<b>By ideology</b>	Conservative	7%	17%	24%	23%	17%	12%
	Moderate	13%	43%	22%	5%	5%	12%
	Liberal	36%	28%	18%	3%	1%	13%

- Note that the text table masks the shape of grades
  - For example, it is difficult to see that 82%, 78%, and 48% of the three ideological groups give Obama passing grades of C or better
  - Conservatives fail Obama on Terrorism at 17 times the rate of liberals and 5 times the rate of moderates, but this doesn't jump out, you must look for this

# Recommended View- Ideology Survey Results

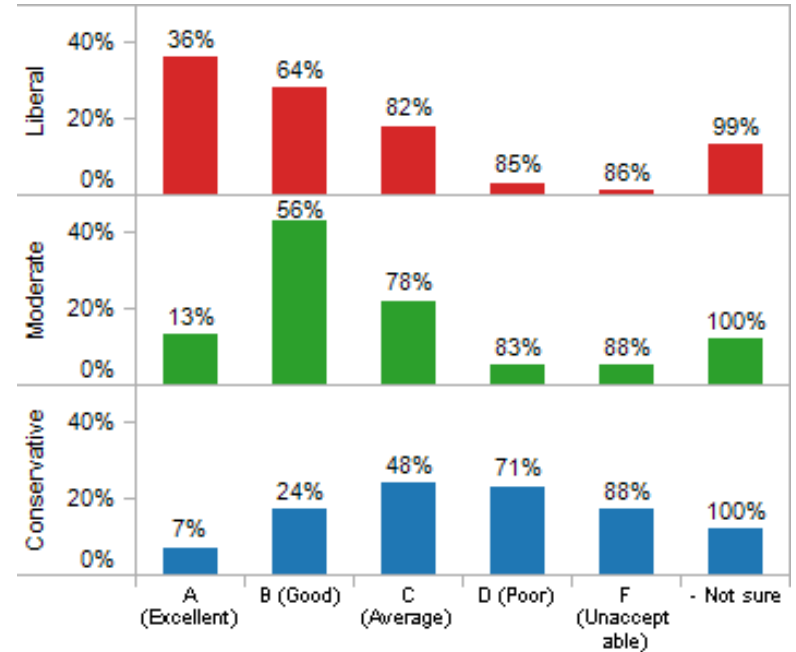


- Recommended view as an aligned bar chart
  - Liberals peak at A's, Moderates at B, and Conservatives at C's
  - All three distributions have different shapes with moderates having the largest peak
  - Easy to see the median with the running totals- B, B and D respectively

# Contrast of Ideology Survey Results Views

		A (excellent)	B (good)	C (average)	D (poor)	F (unacceptable)	Not sure
<b>By party</b>	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
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Original



Recommended

# Conclusion

- Avoid the use of pie charts
- Use text tables when individual data point values are important on their own or for detailed value comparison
  - Avoid them when the distribution of the results is the main information to convey
  - A poor choice for this application
- Bar charts are one of the most flexible charting vehicles
  - Excellent at contrasting categorical data distributions
  - Exactly the main objective for this application

# Acknowledgements

- [Tableau Software](#) – visualization software used for recommendations
- Microsoft Excel- data management
- Visualization principles expounded by
  - Edward Tufte
  - Stephen Few