

Effectively Communicating Survey Data: Beyond Text Tables and Pie Charts

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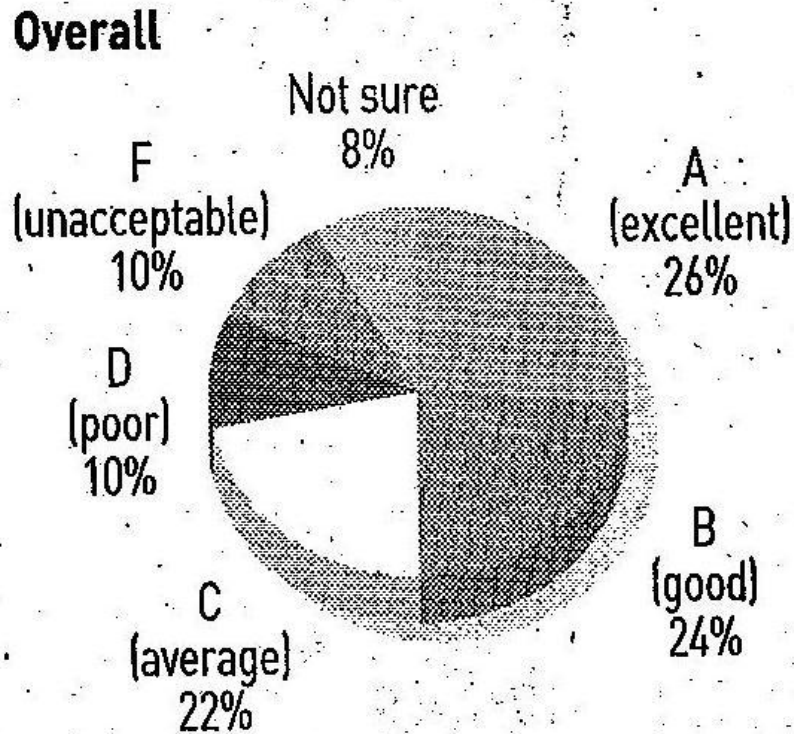
Effectively Communicating Survey Data: Beyond Text Tables and Pie Charts

- Topic: Obama Terrorism Grade Poll
 - Original Research by: Technometrica Market Intelligence
 - 926 adults surveyed, March 31st – April 5th
 - 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

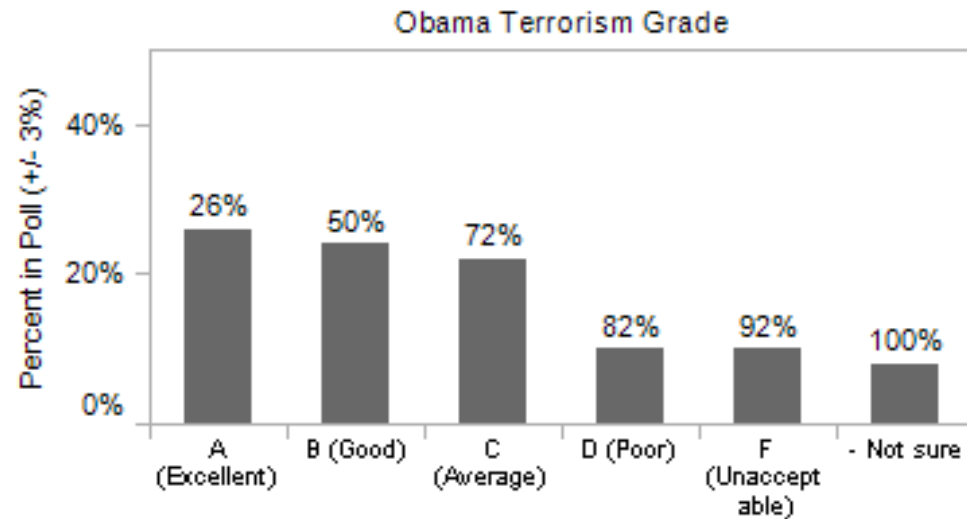
- Results are summarized three ways in the article
 - Overall for all respondents
 - By political party
 - By ideology
- Two presentation methods are used
 - Pie chart
 - Two text tables
- Cited margin of error for sample is +/- 3.3%

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



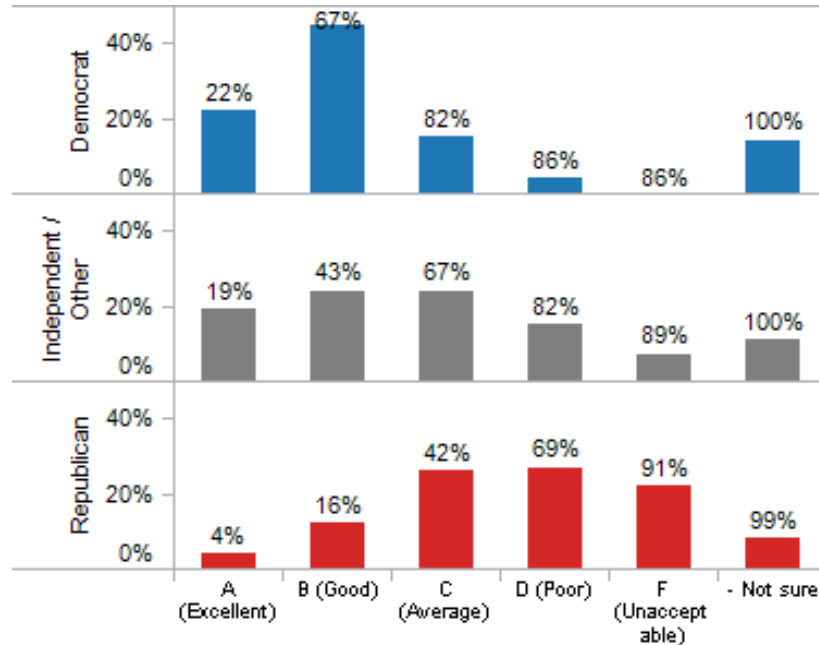
- Replace the pie chart with a bar chart
 - Much cleaner look
 - Added running total percentages from left to right
 - Since the grade encoding has ordinal meaning from left to right, this is a useful addition
- Note that it is much easier to compare the ratio of each grade in the bar chart than in the 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
By party	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
	Ind./other	19%	24%	24%	15%	7%	11%
By ideology	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

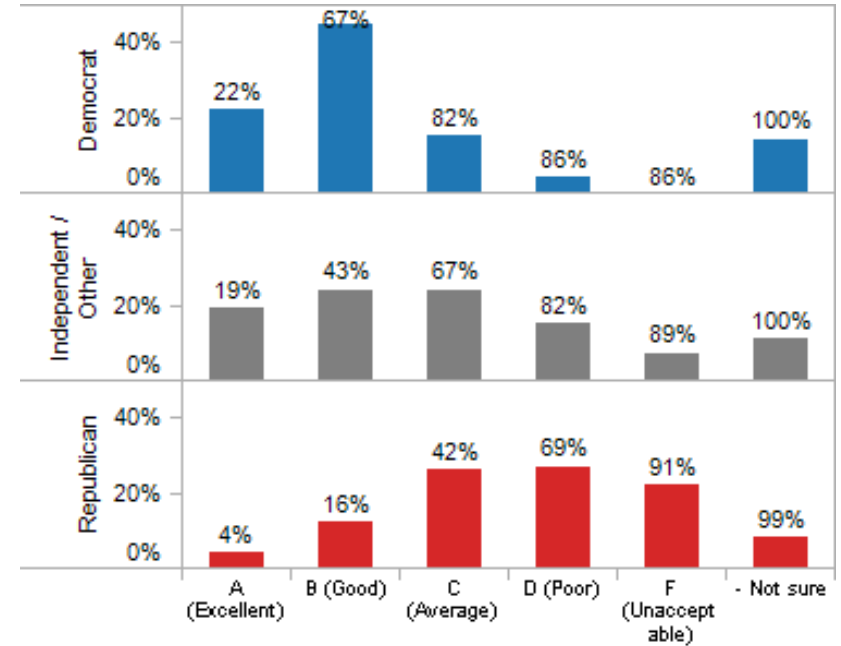


- Recommend revising data presentation as an aligned bar chart
 - Democrats peak at B's, Independents at B/C, and Republicans at D's
 - With aligned bars, it is easy to see that the Independent and Republican distributions are similar in shape, just centered differently
 - Democrats have a higher consensus (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
By party	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
	Ind./other	19%	24%	24%	15%	7%	11%
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Original



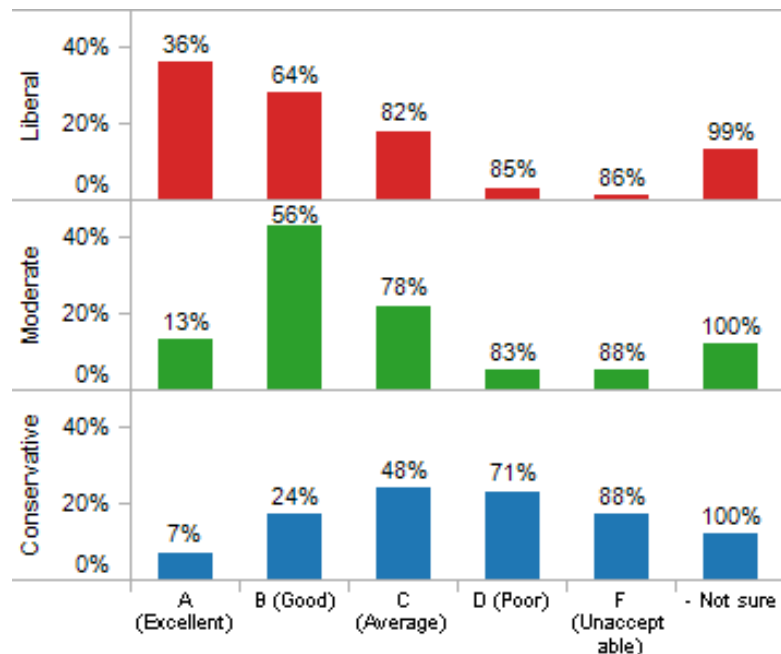
Recommended

IBD Ideology Survey Results Text Table

		A (excellent)	B (good)	C (average)	D (poor)	F (unacceptable)	Not sure
By party	Democrats	22%	45%	15%	4%	0%	14%
	Republicans	4%	12%	26%	27%	22%	8%
	Ind./other	19%	24%	24%	15%	7%	11%
By ideology	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

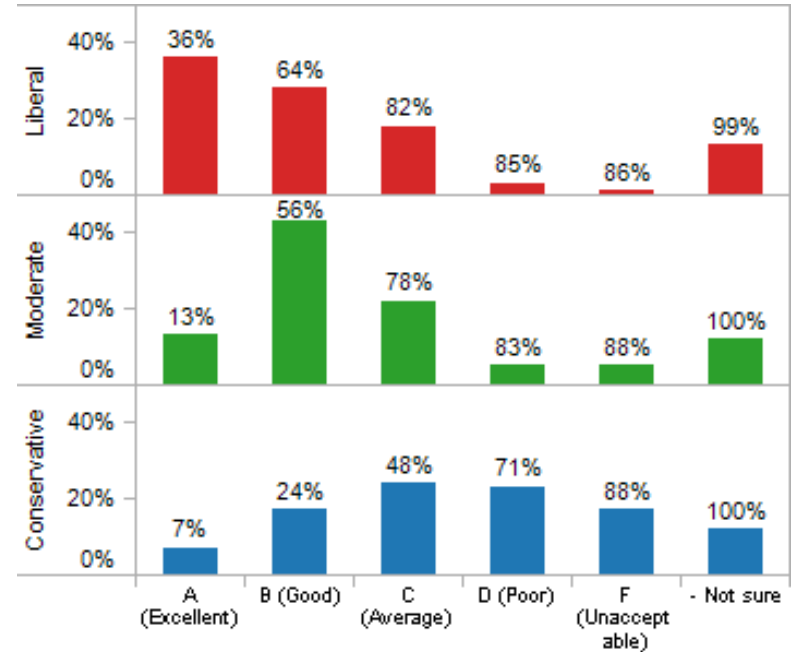


- Recommended view as an aligned bar chart
 - Liberals peak at A's, Moderates at B, and Conservatives at C's
 - All three distributions have different shapes with moderates having the largest peak
 - Easy to see the median with the running totals- B, B and D respectively

Contrast of Ideology Survey Results Views

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

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