

Quantity Words without Numbers: Why Students Use “Many”

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Preliminary findings based on student writings at Carleton College¹ indicate that “many” is perhaps the most commonly-used quantity word that doesn’t involve a number. To better understand why students prefer using ‘many’, this paper first reviews those words and phrases that indicate quantity non-numerically, classifies these terms into groups and examines which groups might be most readily misunderstood. Having done so this paper examines four different kinds of explanations for why students may prefer to use ‘many’. It is argued that students use ‘many’ because they lack training in using ordinary English to describe and compare rates and percentages as presented in tables and graphs.

This extensive use of ‘many’ indicates the need students have for statistical literacy. Statistical literacy is critical thinking about everyday arguments that use statistics as evidence. Appendix A contains a list of the top 25 books on Statistical literacy as of 2004. Statistical literacy is closely related to quantitative literacy and to statistical reasoning. See Schield, 2004a and b. Teachers who want to quickly assess the statistical literacy of their students are invited to administer a short Five Percentage Table survey.

BACKGROUND:

Appendix B contains a list of 545 words and phrases that have quantitative meaning but do not involve a specific numeric value. As words were added, additional words were obtained by using a Thesaurus. Since there is no way to prove that this grouping is representative this list must be regarded as provisional. In building this list, some words involving quantity were excluded. Words indicating relative value (e.g., ‘good deal,’ ‘bad deal’) were omitted. ‘Top’ was omitted as overly equivocal. Some words indicating a quantitative relation were excluded (percentage, rate, chance) while others were included (relation, association, correlation). Some borderline words were included. Words indicating the extremes in rank (e.g., first, last) were included. Words indicating quantity in a more extreme or expressive manner were included whether emotive (e.g., huge, significant, considerable, sizable, vast and enormous) or psychological (e.g., impressive, incredible, amazing, and dizzying).

While many of these words are equivocal, some are highly equivocal. “Most” can indicate the maximum (most popular) or the majority (most people).^{2,3} “First” can be based on a social ordering of people or events (first-place winner in a golf tournament) or on a temporal ordering of events within a

¹ Based on a verbal presentation by Dr. Neil Lutsky and Dr. Scott Bierman at the National Numeracy Network conference at Macalester College in June, 2005.

² MOST (adj): **1** : greatest in quantity, extent, or degree <the *most* ability> **2**: the majority of <*most* people>. MOST (adverb): **1** : to the greatest or highest degree -- often used with an adjective or adverb to form the superlative <the *most* challenging job he ever had> **2** : to a very great degree <was *most* persuasive>. Merriam-Webster.

³ If the appositive ‘the’ can be placed ahead of “most”, then the usage is as a superlative. When ‘the’ precedes BEST, it is superlative, but when ‘a’ precedes BEST it indicates the item is one of many in the BEST class.

given person's life (first auto accident). "Best" can indicate either "the best" (superlative) or "a best" (one of many in the top category). "Lot" can indicate either quantity ("a lot of people") or a piece of land for a house or building. "Top" can indicate either highest quantity or top-side (physical orientation). "Tremendous" can indicate either huge (in amount or size) or marvelous (an evaluative or aesthetic judgment). "Significant" can mean either considerable (in amount or size) or important (an evaluation).

CLASSIFICATION:

Twenty-six groups (17 primary and 9 auxiliary) were formed from the 545 terms in Appendix B by looking for those terms having the closest internal similarity and the greatest external difference. Appendix C shows the contents of each of these groups using this classification. The auxiliary groups are those that involve a word that modifies another word from more than one of the primary groups. Auxiliary groups involve auxiliary words such as "not", "at least," "too," "almost, quite & nearly" and adverbs such as "very, especially & extremely".

As mentioned previously, MOST is equivocal. The first meaning (the most) is already contained in the superlative so a second group (MAJORITY/MINORITY) is created for the second meaning (most people). There are many ways to classify these words such as time vs. things and discrete vs continuous things. Note the difference between BIG/LITTLE⁴, and MANY/FEW.⁵

This classification involves 17 primary groups. A confirmation that these groups may be foundational is that words from 9 of these groups are found in the top 14 terms⁶ in Appendix B.

Whether these categories are optimal or even meaningful may be interesting, but it is not central. The central question is why students use these fuzzy, non-numeric quantity words when they have data that allows them to use more exact numeric terms to form descriptions and comparisons.

A more extreme question is why students and journalists will omit even these non-numeric quantity words entirely as when they say, "Today's kids." If the property in question is something that each subject has (height or weight), then we focus on which kids. But if the property in question is possessed by only a fraction of the group, then we need to know the size of that fraction. Without a percentage or rate, we don't really know much about the claim.

In order of precision, we have "kids," "some" kids (#2), "many" kids (#11), "most" kids (#4), "almost all" or "nearly all" kids (#22), and "every" kid or "all" kids (#1). But none of these have the precision of saying, "85% of kids ages 11-13..."

⁴ While BIG/LITTLE, LARGE/SMALL, RICH/POOR, TALL/SHORT can describe measurements, only the first two pairs can describe counts (a big or large group, but not a rich or tall group).

⁵ BIG or LITTLE refer to either a measurement or a count whereas MANY or FEW refer only to a count.

⁶ The top 14 terms from Appendix B based on web prevalence: **up** (9.6), **any** (9.5), **first** (9.5), last (9.5), best (9.5), **more** (9.4), **some** (9.4), all (9.4), add* (9.4), **many** (9.3), full (9.3), **change*** (9.3), **high** (9.3) and **related*** (9.3). The bolded terms are headings to different groups.

POSSIBLE EXPLANATIONS:

So why might students prefer the use of MANY/FEW (or HUGE/TINY) or avoid using any quantity related term (e.g., kids, students, journalists, etc.)?

One class of reasons focuses on the data. If students lack the data, then they are justified in avoiding any quantity term by saying “Kids” or in using a safe term like ‘many.’ But this reason would not apply when students have the data in a table or graph.

A second group of reasons focuses on the precision in the various groups. Note that ALL (100%) and MOST (at least 50%) require at least 50% so leaving aside “Almost all” and “almost none” there is no group that is useful for making distinctions involving percentages below or above 50% so using MANY/FEW or SOME/NONE are the only such groups that are useful.

A third group of reasons focuses on the students. Assuming that students had the data, perhaps they are just too lazy to work at understanding the data and forming a conclusion in ordinary English. Or perhaps they are terrified of making a mistake. If students view the emotive category (HUGE/TINY) as overly rhetorical and view the SOME/NONE category as safe but uninspiring, they choose MANY/FEW as the middle road. Since numbers are abstract, students may not see them as being concrete in the sense of being precise and giving evidence for abstract ideas. Or perhaps students are unaccustomed to using language with much precision so they fail to distinguish ‘among,’ ‘of,’ ‘who are’ and ‘between.’

A fourth group of reasons focuses on what students are not being taught. Perhaps students do not know how to read simple tables of rates and percentages. To see if this is the case, have students complete the Five Percentage Table Survey.⁷ Preliminary results indicate that less than 20% of students can answer all 5 questions correctly. If students cannot read the percentages and rates presented in tables correctly, they are most likely to have difficulty writing such descriptions and comparisons. If students need help they can use the on-line drill program developed Burnham and Schield (2005) under the W. M. Keck Statistical Literacy project. This program presents students with tables of rates and percentages, asks them to describe a value or to compare two values in ordinary English, and then gives helpful feedback on student errors and omissions. To use the program, go to www.StatLit.org/RSVP.

CONCLUSION:

If students and journalists⁸ are to be dissuaded from the over-use of “many”, they must be taught how to read and interpret numeric data as presented in tables and graphs and how to communicate descriptions and comparisons of rates and percentages using ordinary English.

⁷ Either print a copy from www.StatLit.org/pdf/2005Schield5PctgTableSurvey.pdf and administer it in class or else have students take the five-question survey online at www.StatLit.org/Survey.

⁸ *Weasel-Words Rip My Flesh! Spotting a bogus trend story on Page One of today's 'New York Times'* by Jack Shafer, Slate's Editor at Large Posted Tuesday, Sept. 20, 2005, at 3:38 PM PT in reference to Louise Story's article, "Many Women at Elite Colleges Set Career Path to Motherhood" on page One of the Sept. 20, 2005 New York

RECOMMENDATIONS:

To be statistically literate, students must know how to evaluate quantity words that are non-numeric.

1. Students must be educated on the importance of context for any quantity term. Without a clear statement, all claims about that group or characteristic are vague if not meaningless. To say, 'all' or 'none' says nothing about the group involved. Sometimes the full context may not be readily apparent. Consider this: "*TypeReade OCR: the most accurate OCR available from Scanhelp.com.*" The phrase, "most accurate OCR" sounds extremely powerful but the modifier "available from Scanhelp.com" limits the field considerably.
2. Students should be aware that some terms such as 'many' (at least 3) and 'some' (at least 2) are all but vacuous quantitatively.
3. Students should be aware of the different members of the MANY group.
4. Students should be surveyed to see if they know the differences between these groups.
5. Students should use as much precision as is needed for the argument at hand.
6. Students should see that numbers can provide concrete details in essays and strength in arguments.
7. Students must see how these phrases can be used to inflate numbers (A great many kids in the world are starving) or to deflate numbers (Only a minority [40%] of the students were found guilty of cheating on the SAT tests).
8. Students must be taught how to describe and compare numbers in ordinary English in order to add precision and strength to their arguments.

References

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Times. In this 2,200 word article, 'many' was used 12 times: "many women" (3 times), "many of these women," "many others," "many students," "many of her girl friends," "many young women," (2 times) "many of their mothers," "many of the men in her American Family class approved" and "many feminists." The term 'few students' appeared twice.

Appendix A. Schield's 2004 Top-25 List of Statistical Literacy Books. Organized by date

Top Five (As of 2004)

- Darrell Huff (1954), *How To Lie with Statistics*
- John Paulos (1988), *Innumeracy: Mathematical Illiteracy and its Consequences*
- Lynn Steen (2001), *Mathematics and Democracy: The Case for Quantitative Literacy*
- Joel Best (2002), *Damned Lies and Statistics*
- Jane Miller (2004), *The Chicago Guide to Writing About Numbers*

Rest of the Top Ten (As of 2004)

- Edward Tufte (1983), *The Visual Display of Quantitative Information*
- Victor Cohn (1989), *News and Numbers*
- Lynn Steen, Editor (1997), *Why Numbers Count: Quantitative Literacy for Tomorrow's America*
- John Allen Paulos (1995), *A Mathematician Reads the Newspaper*
- Joel Best (2004), *More Damned Lies and Statistics*

The Rest of the Top Twenty-Five (as of 2004).

- Hans Zeisel (1947), *Say It With Figures*
- Stephen K. Campbell (1974), *Flaws and Fallacies in Statistical Thinking*
- Stanley Lieberman (1985), *Making It Count*
- Eleanor Wilson Orr (1987), *Twice as Less: Does Black English stand between black students and success in math and science?*
- J. H. Abramson (1988), *Making Sense of [Epidemiological] Data*
- Phillip Meyer (1991), *The New Precision Journalism*
- A. K. Dewdney (1995), *200% of Nothing: From "Percentage Pumping" to "Irrational Ratios" An Eye-opening Tour through the Twists and Turns of Math Abuse and Innumeracy*
- Edward Tufte (1995), *Visual Explanations*
- Jessica Utts (1999), *Seeing Through Statistics*
- John Brignell (2000), *Sorry Wrong Number*
- Howard Wainer (2000), *Visual Revelations*
- Robyn Dawes (2001), *Everyday Irrationality*
- David Murray, Joel Schwartz and S. Robert Lichter (2001). *It Ain't Necessarily So. How Media Make and Unmake the Scientific Picture of Reality.*
- John Brignell (2004), *The Epidemiologists*
- Lynn Arthur Steen (2004), *Achieving Quantitative Literacy*

Alternates:

- Sarah Cohen (2001), *Numbers in the Newsroom: Using Math and Statistics in the News*
- Lynn Steen, Editor (1990), *On The Shoulder's Of Giants: New Approaches to Numeracy*

Statistical Literacy on the Web

www.StatLit.org is a key site for articles, books and links on statistical literacy.

www.Augsburg.edu/statlit is home for the W. M. Keck Statistical Literacy Project at Augsburg College.

[www.StatLit.org/Survey Percentage Tables Survey](http://www.StatLit.org/Survey_Percentage_Tables_Survey). This is a 5 question multiple-choice survey with immediate feedback on reading five simple tables involving percentages. It includes three percentage tables with 100% margins plus two additional tables of percentages lacking 100% margins.

Appendix B. Quantitative Words and phrases that do not involve Numbers

This list of 545 non-numeric quantity words and phrases is sorted by prevalence. Phrases are shown in quotes.⁹ Words followed by asterisks stand for a group of similar words. E.g., Change* stands for change, changes, changing and changed. The number in parentheses represents the number of web hits (\log_{10}) as of fall 2005 by Yahoo Search.¹⁰ This list is not claimed to be exhaustive or representative.

up (9.6), **any** (9.5), **first** (9.5), last (9.5), best (9.5), **more** (9.4), **some** (9.4), all (9.4), add* (9.4), **many** (9.3), full (9.3), **change*** (9.3), **high** (9.3), **related*** (9.3), great (9.3), part (9.2), each (9.2), **very** (9.2), much (9.2), "the best" (9.2), down (9.1), both (9.1), every (9.1), **most** (over half)* (9.1), small (9.1), "the first" (9.1), difference* (9.1), too (9.1), little (9.1), better (9.1), additional* (9.1), association* (9.1), "the most" (9.0), "more than" (9.0), fall* (9.0), low (9.0), loss* (9.0), few (9.0), faster (9.0), big (9.0), large (9.0), grow* (9.0), always (9.0), improve* (8.9), less (8.9), several (8.9), something* (8.9), major (8.9), modify/modification* (8.9), increase* (8.9), least (8.9), share (8.9), rise* (8.9), "a few" (8.9), anything (8.8), jump* (8.8), **enough** (8.8), later (8.8), wide (8.8), cut* (8.8), often (8.8), "at least" (8.8), anyone (8.8), whole (8.8), common* (8.8), common (8.8), "a lot" (8.8), complete (8.8), **almost** (8.8), reduce/reduction* (8.8), extra (8.8), nothing (8.8), everyone (8.8), extend/extension* (8.7), similar (8.7), perfect (8.7), normal* (8.7), entire (8.7), regular* (8.7), largest (8.7), probably (8.7), especially (8.7), expand / expansion* (8.7), higher (8.7), lowers* (8.7), "most of" (8.7), drop* (8.7), quite (8.7), sometime* (8.6), lower (8.6), fair (8.6), "a lot of" (8.6), gain* (8.6), **huge** (8.6), enhance/enhancement* (8.6), bottom (8.6), likely (8.6), greater (8.6), frequently (8.6), larger (8.5), piece (8.5), lots (8.5), "the entire" (8.5), "less than" (8.5), poor (8.5), nearly (8.5), significant (8.5), highest (8.5), rich (8.5), none (8.5), maximum (8.5), lowest (8.5), "a bit" (8.5), earlier (8.5), "a number of" (8.5), minimum (8.5), various (8.5), "the largest" (8.4), slowed* (8.4), spread* (8.4), amazing (8.4), alter/alteration* (8.4), biggest (8.4), short (8.4), lack (8.4), "no one" (8.4), "most popular" (8.4), "a little" (8.4), greatest (8.4), "as much" (8.4), mostly (8.3), vary/variation* (8.3), "the more" (8.3), extensive (8.3), smaller (8.3), extremely (8.3), upper (8.3), completely (8.3), minor (8.3), equal (8.3), "too much" (8.3), repeat* (8.3), generally (8.3), slightly (8.3), majority (8.3), "the whole" (8.3), transform/transformation* (8.3), factor (8.3), numerous (8.3), empty (8.3), "the highest" (8.3), broad (8.3), worst (8.3), enlarge/enlargement* (8.2), "the biggest" (8.2), bigger (8.2), giant (8.2), plenty (8.2), "no more" (8.2), massive (8.2), boost* (8.2), excess* (8.2), tiny (8.2), everybody (8.2), awesome (8.1), consistent (8.1), relatively (8.1), entirely (8.1), nobody (8.1), vast (8.1), continuous* (8.1), decrease* (8.1), somewhat (8.1), everywhere (8.1), "the greatest" (8.1), reverse* (8.1), "as much as" (8.1), incredible (8.1), fairly (8.1), significantly (8.1), narrow (8.1), "very much" (8.1), tall (8.1), constantly (8.0), greatly (8.0), anybody (8.0), substantial (8.0), "every time" (8.0), "too many" (8.0), supplement* (8.0), impressive (8.0), "the small" (8.0), mainly (8.0), petit (8.0), steady* (8.0), fewer (8.0), "most people" (8.0), somebody (8.0), adequate (8.0), continually* (8.0), petite (7.9), considerable (7.9), rarely (7.9), "a piece" (7.9), minority (7.9), "a perfect" (7.9), largely (7.9), balanced (7.9), "little bit" (7.9), unlikely (7.9), "most likely" (7.9), frequent (7.9), shorter (7.9), loads (7.9), slight (7.9), enormous (7.8), "the large" (7.8), "not always" (7.8), consistently (7.8), tremendous (7.8), "just a few" (7.8), "more likely" (7.8), "not enough" (7.8), mighty (7.8), "number one" (7.8), "most common" (7.8), "is most" (7.8), "very little" (7.8), "the poor" (7.8), modest (7.8), incredibly (7.8), consensus (7.7), "almost all" (7.7), deficit (7.7), "only a few" (7.7), incomplete (7.7), "the greater" (7.7), soar* (7.7), "not much"* (7.7), swell* (7.7), lesser (7.7), sooner (7.7), correlation* (7.7), bias (7.7), multiply* (7.7), fraction (7.7), "not quite" (7.7), surplus (7.6), "the larger" (7.6), even-handed (7.6), smallest (7.6), "lower than" (7.6), "very few" (7.6), unbiased (7.6), rebound* (7.6), slower (7.6), unfair (7.6), inadequate (7.6), "the less" (7.6), mandate (7.6), "the rich" (7.6), "too far" (7.6), mushroom* (7.6), "very small" (7.5), "very large" (7.5), immense (7.5), abundance (7.5), shortage (7.5), "most wanted" (7.5), altogether (7.5), "the smallest" (7.5), unchanged* (7.5), quicker (7.4), seldom (7.4), "too small" (7.4), trivial (7.4), unchanged* (7.4), uncommon (7.4), jumbo (7.4), "the smaller" (7.4), "for the most part" (7.4), "vast majority" (7.4), incremental*

⁹ The phrase, the best, return 2.8 billion hits, while the phrase, "the best" returns 1.6 billion hits.

¹⁰ The number to the left of the decimal sign indicates the number of zeroes following '1' so 2 indicates 100 and 4 indicates 10,000. The number to the right of the decimal indicates the digit to be used in place of '1' so 2.2 indicates 200 and 4.4 indicates 40,000.

(7.4), everytime (7.4), taller (7.4), "nearly all" (7.4), inconsistent (7.4), "quite a few" (7.4), titanic (7.4), upward (7.4), exceptionally (7.4), "not more" (7.4), "a most" (7.4), amplify* (7.4), shortest (7.4), augment* (7.3), "a fraction" (7.3), "not least"* (7.3), deficiency (7.3), downward (7.3), tad (7.3), biased (7.3), "top notch" (7.3), "less likely" (7.3), "a best" (7.3), moderately (7.3), "too big" (7.3), scarce (7.3), gigantic (7.3), "not many"* (7.3), "a share" (7.3), astonishing (7.3), mammoth (7.2), "not everyone" (7.2), "best part" (7.2), "the bigger" (7.2), monumental (7.2), "not completely" (7.2), habitual* (7.2), "too little" (7.2), overkill (7.2), teeny (7.2), quicken* (7.2), vastly (7.2), "very often" (7.2), "too close" (7.2), acme (7.2), "not entirely" (7.1), insignificant (7.1), disproportionate* (7.1), uneven (7.1), hugely (7.1), "top priority" (7.1), "over half" (7.1), subtract* (7.1), "not the best"* (7.1), impartial (7.1), hefty (7.1), immensely (7.1), "on the whole" (7.1), recurrent* (7.1), "not less" (7.1), "no change" (7.1), plentiful (7.1), "very big" (7.1), microscopic (7.1), "no less than" (7.1), "not every" (7.1), "not the first"* (7.1), plethora (7.0), skewed* (7.0), "not the most"* (7.0), extraordinarily (7.0), infinitely (7.0), "more than a few" (7.0), "first rate" (7.0), enormously (7.0), exceedingly (7.0), "the lesser" (7.0), "worst case" (7.0), "take from"* (7.0), "more than enough" (7.0), "not a lot" (7.0), "less than half" (7.0), shortfall (7.0), "the more than" (6.9), awfully (6.9), "not uncommon"* (6.9), colossal (6.9), unequal (6.9), sizeable (6.9), tallest (6.9), "great many" (6.9), minimally (6.9), glut (6.9), "not last"* (6.9), "almost everyone" (6.8), "great big" (6.8), "large part" (6.8), "not often"* (6.8), "as a rule" (6.8), "too few" (6.8), "small percentage" (6.8), "not too much" (6.8), "statistically significant" (6.8), scarcity (6.8), infrequent (6.8), meager (6.8), "very many" (6.8), infrequently (6.7), "not quite sure" (6.7), "most frequent" (6.7), "small piece" (6.7), "major factor" (6.7), proportional* (6.7), plurality (6.7), "quite a lot" (6.7), "not big"* (6.7), "almost nothing" (6.7), persistently (6.6), "high percentage" (6.6), diminutive (6.6), pro-rata (6.6), slanted (6.6), "great majority" (6.6), skimpy (6.6), "greater part" (6.6), preponderance (6.6), dearth (6.6), "a major factor" (6.6), "not too many" (6.6), paltry (6.5), prodigious (6.5), lopsided (6.5), "small fraction" (6.5), stupendous (6.5), dizzying (6.5), "almost as much" (6.5), "large majority" (6.5), "increases as" (6.5), miniscule (6.5), "nearly everyone" (6.5), "nearly as much" (6.4), "not common"* (6.4), "not everybody" (6.4), "most easily" (6.4), measly (6.4), infinitesimal (6.4), "highest degree" (6.4), "small minority" (6.4), gargantuan (6.4), littlest (6.4), "nearly enough" (6.4), "bare minimum" (6.4), "as a minimum" (6.3), "not adequate" (6.3), scanty (6.3), "a quantity of" (6.3), "statistical significance" (6.3), "more than adequate" (6.3), unfilled (6.3), "not altogether" (6.3), trifling (6.3), immeasurably (6.3), "the less than" (6.2), "at least as much" (6.2), "at least as" (6.2), "upper half" (6.2), "over budget" (6.2), "large share" (6.2), "very full" (6.2), "large piece" (6.2), "positive correlation" (6.2), "very complete" (6.2), "not the worst" (6.2), "positively correlated" (6.2), "not very much" (6.2), "almost none" (6.1), "very seldom" (6.1), "almost no one" (6.1), "the acme" (6.1), "no lack" (6.1), "not a bit" (6.1), "correlation coefficient" (6.1), "speed ahead" (6.0), "largest part" (6.0), scintilla (6.0), "itsy bitsy" (6.0), littler (6.0), "not nearly enough" (6.0), "decreases as" (6.0), "not small"* (6.0), "biased against" (6.0), "hardly enough" (6.0), "barely enough" (6.0), "not biggest" (6.0), "under budget" (5.9), "negative correlation"* (5.9), "not huge" (5.9), "not very many" (5.9), "high rank" (5.9), "least common" (5.9), "significant correlation" (5.9), surfeit (5.9), scads (5.9), "negatively correlated"* (5.9), "no excess" (5.8), "not excessive" (5.8), smidge (5.8), "almost nobody" (5.8), "low percentage" (5.8), "biased toward" (5.8), "the major factor" (5.7), "biased by" (5.7), "major risk factor" (5.7), "significant association" (5.7), "small margin" (5.7), "small share" (5.7), "biased to" (5.6), "not quite enough" (5.6), "substantial majority" (5.6), "smaller proportion" (5.6), "statistically insignificant" (5.6), "nearly everybody" (5.6), "huge majority" (5.5), slighter (5.5), "smaller part" (5.5), "biased in favor of" (5.5), superfluity (5.5), "large minority" (5.4), "not a hint" (5.4), "barely adequate" (5.4), "smaller share" (5.4), "nearly nothing" (5.4), "significant risk factor" (5.3), "not quite as much" (5.3), "not smallest"* (5.3), seldomly (5.3), "small majority" (5.3), "not infrequent" (5.3), "not quite all" (5.3), "narrow majority" (5.3), "very inadequate" (5.3), "non-negligible" (5.2), "not tiny" (5.2), "bare majority" (5.2), "not quite certain" (5.2), "nearly none" (5.2), "below budget" (5.1), "big majority" (5.1), "smaller fraction" (5.1), "strong factor" (5.1), pythonic (5.0), "significant relation" (4.9), "not just some of" (4.9), "not an iota" (4.9), "almost last" (4.8), "almost first" (4.7), "not inadequate" (4.7), "hardly adequate" (4.6), "likely factor" (4.6), "nearly no one" (4.2), "enormous majority" (4.1), "not quite everyone" (3.4), "likely risk factor" (3.1),

Note: Prevalence ["most (over half)] = Prevalence ["most"] minus Prevalence ["the most"].

Appendix C. Preliminary Classification of Quantity Words and Phrases not involving Numbers

The following classification is very preliminary since there is no assurance that the list of non-numeric quantity words or phrases is adequately extensive or representative and since there are many ways these terms could be classified. Phrases were classified in 26 groups: 17 primary and 9 auxiliary.

PRIMARY: Groups 1 and 2 phrases are quantifiers: whole vs. part and some vs. none. Group 3 phrases are the superlatives. Group 4 phrases are implicit comparatives (e.g., “most people”) involving a majority. Group 5 terms focus on similar vs. different or equal vs. unequal. Group 6 involves change. Group 7 phrases are explicit comparatives that can be followed by “than.” Group 8 phrases involve a comparison usually involving time. Group 9 phrases involve comparisons that include “as” but not “than”. Group 10 phrases involve bias; group 11 phrases involve association and chance. Group 12 phrases involve implicit comparatives that cannot be followed by “than.” Group 13 phrases involve comparisons of a measure with some range (e.g., high or low). Group 14 phrases involve comparisons of a count with some standard (e.g., many or few). Group 15 phrases involve a comparison of count or measure with some budget or minimum (e.g., enough). Group 16 phrases involve excess/shortage comparisons. Group 17 phrases are primarily rhetorical.

AUXILIARY: Groups 18-26 are combinations with words in primary categories. Group 18 involves combinations from two primary groups (vast majority). Group 19 phrases involve “not”. Group 20 phrases involve “at least.” Group 21 phrases involve “too.” Group 22 phrases involve “almost,” “quite” or “nearly.” Group 23 phrases involve adverbs such as “very,” and “greatly.” Group 24 involves combinations of “very” with terms from other categories. Group 25 involves “not” while group 26 involves combinations from at least three categories (e.g., “an incredibly small minority.”)

1. **any** (9.5), all (9.4), full (9.3), each (9.2), both (9.1), every (9.1), always (9.0), anything (8.8), anyone (8.8), whole (8.8), complete (8.8), everyone (8.8), entire (8.7), "the entire" (8.5), completely (8.3), "the whole" (8.3), everybody (8.2), entirely (8.1), everywhere (8.1), anybody (8.0), "every time" (8.0), altogether (7.5), everytime (7.4), **part** (9.2), share (8.9), piece (8.5), "a piece" (7.9), "not always" (7.8), incomplete (7.7), fraction (7.7), "a fraction" (7.3), "a share" (7.3), "not everyone" (7.2), "not completely" (7.2), "not entirely" (7.1), "not every" (7.1), "not everybody" (6.4), "not altogether" (6.3),
2. **some** (9.4), several (8.9), something* (8.9), sometime* (8.6), "a number of" (8.5), various (8.5), somebody (8.0), "a quantity of" (6.3), **nothing** (8.8), none (8.5), "no one" (8.4), empty (8.3), nobody (8.1), unfilled (6.3), "not a bit" (6.1), "not a hint" (5.4), "not an iota" (4.9),
3. **first** (9.5), **best** (9.5), "the best" (9.2), "the first" (9.1), "the most" (9.0), perfect (8.7), largest (8.7), highest (8.5), maximum (8.5), "the largest" (8.4), biggest (8.4), "most popular" (8.4), greatest (8.4), "the highest" (8.3), "the biggest" (8.2), "the greatest" (8.1), "a perfect" (7.9), "most likely" (7.9), "number one" (7.8), "most common" (7.8), "is most" (7.8), "most wanted" (7.5), "a most" (7.4), "top notch" (7.3), "a best" (7.3), acme (7.2), "top priority" (7.1), "first rate" (7.0), tallest (6.9), "most frequent" (6.7), plurality (6.7), "most easily" (6.4), "highest degree" (6.4), "the acme" (6.1), "largest

- part" (6.0), **last** (9.5), least (8.9), bottom (8.6), lowest (8.5), minimum (8.5), worst (8.3), smallest (7.6), "the smallest" (7.5), shortest (7.4), "worst case" (7.0), littlest (6.4), "least common" (5.9),
4. **most (over half)*** (9.1), "most of" (8.7), mostly (8.3), upper (8.3), generally (8.3), **majority** (8.3), mainly (8.0), "most people" (8.0), largely (7.9), consensus (7.7), mandate (7.6), "for the most part" (7.4), "best part" (7.2), "over half" (7.1), "on the whole" (7.1), "large part" (6.8), "as a rule" (6.8), "greater part" (6.6), preponderance (6.6), "upper half" (6.2), **minority** (7.9), "less than half" (7.0),
 5. **similar** (8.7), fair (8.6), equal (8.3), consistent (8.1), balanced (7.9), even-handed (7.6), impartial (7.1), proportional* (6.7), pro-rata (6.6), **difference*** (9.1), unfair (7.6), inconsistent (7.4), disproportionate* (7.1), uneven (7.1), unequal (6.9), lopsided (6.5),
 6. **change*** (9.3), modify/modification* (8.9), alter/alteration* (8.4), vary/variation* (8.3), transform/transformation* (8.3), **common*** (8.8), normal* (8.7), regular* (8.7), repeat* (8.3), continuous* (8.1), constantly (8.0), steady* (8.0), continually* (8.0), consistently (7.8), unchanged* (7.5), unchanged* (7.4), habitual* (7.2), recurrent* (7.1), "no change" (7.1), persistently (6.6),
 7. **more** (9.4), better (9.1), "more than" (9.0), higher (8.7), greater (8.6), larger (8.5), "the more" (8.3), bigger (8.2), "more likely" (7.8), "the greater" (7.7), "the larger" (7.6), taller (7.4), "the bigger" (7.2), "the more than" (6.9), **less** (8.9), lower (8.6), "less than" (8.5), smaller (8.3), "no more" (8.2), fewer (8.0), shorter (7.9), lesser (7.7), "lower than" (7.6), "the less" (7.6), "the smaller" (7.4), "less likely" (7.3), "the lesser" (7.0), "the less than" (6.2), littler (6.0), slighter (5.5),
 8. **faster** (9.0), earlier (8.5), sooner (7.7), quicker (7.4), later (8.8), slower (7.6), quicken* (7.2), "speed ahead" (6.0), **slowed*** (8.4), reverse* (8.1),
 9. "as much" (8.4), "as much as" (8.1), "almost as much" (6.5), "at least as much" (6.2), "not quite as much" (5.3),
 10. **bias** (7.7), unbiased (7.6), biased (7.3), skewed* (7.0), slanted (6.6), "biased against" (6.0), "biased toward" (5.8), "biased by" (5.7), "biased to" (5.6), "biased in favor of" (5.5),
 11. **related*** (9.3), association* (9.1), correlation* (7.7), "increases as" (6.5), "correlation coefficient" (6.1), "decreases as" (6.0), **likely** (8.6), factor (8.3), unlikely (7.9), "positive correlation" (6.2), "positively correlated" (6.2), "negative correlation"* (5.9), "negatively correlated"* (5.9), "**statistically significant**" (6.8), "statistical significance" (6.3), "statistically insignificant" (5.6),
 12. **up** (9.6), add* (9.4), grow* (9.0), improve* (8.9), increase* (8.9), rise* (8.9), jump* (8.8), extend/extension* (8.7), expand/expansion* (8.7), gain* (8.6), enhance/enhancement* (8.6), spread* (8.4), enlarge/enlargement* (8.2), boost* (8.2), supplement* (8.0), soar* (7.7), swell* (7.7), multiply* (7.7), rebound* (7.6), mushroom* (7.6), incremental* (7.4), upward (7.4), amplify* (7.4), augment* (7.3), **down** (9.1), fall* (9.0), loss* (9.0), cut* (8.8), reduce/reduction* (8.8), lowers* (8.7), drop* (8.7), decrease* (8.1), downward (7.3), subtract* (7.1), "take from"* (7.0),
 13. **high** (9.3), great (9.3), big (9.0), large (9.0), major (8.9), wide (8.8), rich (8.5), broad (8.3), tall (8.1), "the large" (7.8), "the rich" (7.6), small (9.1), little (9.1), **low** (9.0), poor (8.5), short (8.4), minor (8.3), narrow (8.1), "the small" (8.0), petit (8.0), petite (7.9), "the poor" (7.8),
 14. **many** (9.3), much (9.2), often (8.8), common (8.8), "a lot" (8.8), probably (8.7), "a lot of" (8.6), frequently (8.6), lots (8.5), numerous (8.3), frequent (7.9), "quite a few" (7.4), "more than a few" (7.0), "quite a lot" (6.7), "smaller proportion" (5.6), "smaller part" (5.5), "smaller share" (5.4), "smaller fraction" (5.1), **few** (9.0), "a few" (8.9), "a little" (8.4), rarely (7.9), "just a few" (7.8), "only a few" (7.7), seldom (7.4), uncommon (7.4), infrequent (6.8), infrequently (6.7), seldomly (5.3),
 15. **enough** (8.8), adequate (8.0), "no lack" (6.1), "hardly enough" (6.0), "barely enough" (6.0), "no excess" (5.8), "not excessive" (5.8), "barely adequate" (5.4), "not inadequate" (4.7), "hardly adequate" (4.6),

16. **additional*** (9.1), extra (8.8), excess* (8.2), surplus (7.6), abundance (7.5), overkill (7.2), plethora (7.0), "more than enough" (7.0), glut (6.9), "more than adequate" (6.3), "over budget" (6.2), surfeit (5.9), superfluity (5.5), **lack** (8.4), "not enough" (7.8), deficit (7.7), inadequate (7.6), shortage (7.5), deficiency (7.3), scarce (7.3), shortfall (7.0), scarcity (6.8), dearth (6.6), "not adequate" (6.3), "not nearly enough" (6.0), "under budget" (5.9), "below budget" (5.1),
17. **huge** (8.6), significant (8.5), amazing (8.4), extensive (8.3), giant (8.2), plenty (8.2), massive (8.2), awesome (8.1), vast (8.1), incredible (8.1), substantial (8.0), impressive (8.0), considerable (7.9), loads (7.9), enormous (7.8), tremendous (7.8), mighty (7.8), immense (7.5), jumbo (7.4), titanic (7.4), gigantic (7.3), astonishing (7.3), mammoth (7.2), monumental (7.2), hefty (7.1), plentiful (7.1), colossal (6.9), sizable (6.9), prodigious (6.5), stupendous (6.5), dizzying (6.5), gargantuan (6.4), scads (5.9), pythonic (5.0), "**a bit**" (8.5), tiny (8.2), slight (7.9), modest (7.8), trivial (7.4), tad (7.3), teeny (7.2), insignificant (7.1), microscopic (7.1), meager (6.8), diminutive (6.6), skimpy (6.6), paltry (6.5), miniscule (6.5), measly (6.4), infinitesimal (6.4), scanty (6.3), trifling (6.3), scintilla (6.0), "itsy bitsy" (6.0), smidge (5.8),
18. "**vast majority**" (7.4), "great many" (6.9), "great big" (6.8), "great majority" (6.6), "large majority" (6.5), "substantial majority" (5.6), "huge majority" (5.5), "large minority" (5.4), "big majority" (5.1), "enormous majority" (4.1), "**little bit**" (7.9), "small minority" (6.4), "bare minimum" (6.4), "small margin" (5.7), "small majority" (5.3), "narrow majority" (5.3), "bare majority" (5.2),
19. "**not much**"* (7.7), "not more" (7.4), "not many"* (7.3), "not the best"* (7.1), "not the first"* (7.1), "not the most"* (7.0), "not a lot" (7.0), "not often"* (6.8), "not big"* (6.7), "not common"* (6.4), "not biggest" (6.0), "not huge" (5.9), "**not least**"* (7.3), "not less" (7.1), "not uncommon"* (6.9), "not last"* (6.9), "not the worst" (6.2), "not small"* (6.0), "not smallest"* (5.3), "not infrequent" (5.3), "non-negligible" (5.2), "not tiny" (5.2),
20. "**at least**" (8.8), "no less than" (7.1), "as a minimum" (6.3), "at least as" (6.2),
21. **too** (9.1), "**too much**" (8.3), "too many" (8.0), "too far" (7.6), "too big" (7.3), "**too small**" (7.4), "too little" (7.2), "too close" (7.2), "too few" (6.8),
22. **almost** (8.8), **quite** (8.7), **nearly** (8.5), "almost all" (7.7), "not quite" (7.7), "nearly all" (7.4), "almost everyone" (6.8), "not quite sure" (6.7), "nearly everyone" (6.5), "nearly as much" (6.4), "nearly enough" (6.4), "not quite enough" (5.6), "nearly everybody" (5.6), "not quite all" (5.3), "not quite certain" (5.2), "almost first" (4.7), "not quite everyone" (3.4), "**almost nothing**" (6.7), "almost none" (6.1), "almost no one" (6.1), "almost nobody" (5.8), "nearly nothing" (5.4), "nearly none" (5.2), "almost last" (4.8), "nearly no one" (4.2),
23. **very** (9.2), especially (8.7), extremely (8.3), slightly (8.3), significantly (8.1), greatly (8.0), incredibly (7.8), exceptionally (7.4), vastly (7.2), hugely (7.1), immensely (7.1), extraordinarily (7.0), infinitely (7.0), enormously (7.0), exceedingly (7.0), awfully (6.9), immeasurably (6.3), **relatively** (8.1), fairly (8.1), somewhat (8.1), moderately (7.3), minimally (6.9),
24. "**very much**" (8.1), "very large" (7.5), "very often" (7.2), "very big" (7.1), "very many" (6.8), "very full" (6.2), "very complete" (6.2), "**very little**" (7.8), "very few" (7.6), "very small" (7.5), "very seldom" (6.1), "very inadequate" (5.3),
25. "**not too much**" (6.8), "not too many" (6.6), "not very much" (6.2), "not very many" (5.9),
26. "**small percentage**" (6.8), "small piece" (6.7), "major factor" (6.7), "high percentage" (6.6), "a major factor" (6.6), "small fraction" (6.5), "large share" (6.2), "large piece" (6.2), "high rank" (5.9), "significant correlation" (5.9), "low percentage" (5.8), "the major factor" (5.7), "major risk factor" (5.7), "significant association" (5.7), "small share" (5.7), "significant risk factor" (5.3), "strong factor" (5.1), "significant relation" (4.9), "not just some of" (4.9), "likely factor" (4.6), "likely risk factor" (3.1),

For larger numbers, they used words in their various languages which correspond to expressions, such as lots of people, a heap of apples, a school of fish, and a flock of sheep. For example, a study of thirty Australian languages showed no number above four, and in many of these languages there were number names for only one and two, the larger numbers being expressed simply as much and many. People invented number symbols. To express the number one, they used a numeral like our 1. This numeral, probably, came from the lifted finger, which is the easiest way of showing that we mean one. The numerals we use nowadays are known as Arabic. 4. Mathematics deals with the space forms and quantity relations 5. Arithmetic is the study of