Calibrating Communication Competencies

Donna Surges Tatum
CEO, Meaningful Measurement, Inc. 3170 N. Sheridan Rd. #1008 Chicago, IL 60657
donnatatum@meaningfulmeasurement.com

Abstract. The Many-faceted Rasch measurement model is used in the creation of a diagnostic instrument by which communication competencies can be calibrated, the severity of observers/raters can be determined, the ability of speakers measured, and comparisons made between various groups.

Keywords: Rasch Measurement, Communication Competency, Multifaceted Models

1. Communication Competence

Competence is the application of knowledge, skills and abilities. It is the amount and quality of the things a person can do. Success in most areas of life are dependent upon good communication skills. Aristotle wrote the Rhetoric [9] as a practical guide for those who needed to be persuasive in everyday life. Nearly twenty-five hundred years later, we are still using his ideas and concepts. Many high schools, colleges and universities require the study of discourse, both oral and written. Communication is one of the most important competencies required for almost any job. This is borne out in many surveys through the years. A study from 1975 by Magill, et al. shows that of all the courses taken, college graduates considered public speaking one of the most important and useful in later life. [10] In 2001 a Wall Street Journal report stated that 90% of recruiters said they consider communication and interpersonal skills very important [11]. The six core competency skills for physicians include interpersonal and communication skills [12-13]. The 2008 Society of Human Resource Management (SHRM) Leadership Competencies includes effective communication [14]. A quick internet search for job competencies produces many articles which almost always list communication, including such skills as oral, written, teamwork, and the ability to influence/persuade [15-18].

2. Instrument Development

In 1991 an investigation of public speaking evaluation produced a pilot diagnostic instrument with which to measure speeches. [19] Aristotle’s principles contained in The Rhetoric [9] and elaborated by Monroe in the Motivated Sequence [20] are used as the framework for defining the competencies required to give a persuasive presentation. Hundreds of communication books are published every year. Although the terminology may not be used, most of them contain much of Aristotle’s practical advice on discourse.

Aristotle considered rhetoric a neutral tool to be used to analyze a situation and then artfully present a position. He clearly differentiated between “inartistic” are “artistic” proofs. (I2.9) Inartistic proofs are the facts of the case which must be arranged according to the precepts of the artistic proofs; ethos, logos and pathos. These sources of belief must all be present in order for a persuasive transaction to occur.

Ethos is personal credibility. There are two types of ethos: ascribed and earned Ascribed ethos is what others think prior to the beginning of the communication. It is the halo effect of reputation, profession, organization represented, or perhaps just the color of a tie. Although a person may start with a certain amount of credibility, it must be earned every time that person speaks, for ethos is ephemeral
and can be lost in an instant. Competencies which contribute to credibility are sincerity, mastery of the subject, demeanor, commitment and fairness. Ethos is also enhanced by good delivery skills such as eye contact, posture, fluency, enthusiasm, smooth and complete gestures, authoritativeness, articulation and body movement.

Logos is Greek for “word” so this form of proof is related to language usage and message construction. Competencies include using originality of expression and striking statements, language that is precise and appropriate for the situation, descriptive, vivid and colorful. Message construction includes a well-organized structure, smooth flow, variety of transitions and unusual tactics. The topic must be interesting, manageable and fulfill a purpose. The problem must be expressed clearly, the solution must be clear, concise, practicable and contain novel ideas. Evidence should be appropriate and logical, with a variety of supporting material and understandable numerical information.

Pathos are the emotional appeals inducing states of feeling in the listener. The speaker must have expressive eye contact, identify with the audience and create common ground, demonstrate the importance of the topic, focus on the advantages to the listeners, generate appropriate responses, and have a compelling style, riveting the listener. When appropriate, humor can illustrate key points and be an effective persuasive strategy. Above all, the speaker must create a strong need in the listener to listen, then relieve the tension by effectively resolving cognitive dissonance.

The Motivated Sequence was first published in 1935 by Alan H. Monroe in the classic textbook, Principles and Types of Speech. It has been in continuous publication and is now in its 18th edition. This plan to organize and present thoughts in a persuasive manner consists of five chronological steps. It psychologically follows the stages by which people learn and become motivated to adopt an attitude or take action. Briefly it involves: 1) Attention Step: Get and maintain the attention of the listeners. 2) Need Step: Demonstrate the need; pose a problem; create cognitive dissonance. 3) Satisfaction Step: Fulfill the need; present the solution; give the plan; relieve cognitive dissonance. 4) Visualization Step: Project the results of what will happen if the solution is or is not adopted by involving the listeners in picturing the future. 5) Action Step: Request specific action by telling the listeners exactly what is wanted for them to do, what they should do, or what they can do. When implemented, this method gives the speaker a structure which with to help the listeners persuade themselves. It encompasses the artistic proofs Aristotle says are necessary to have a successful persuasive transaction.

From 1992 – 2000 this author experimented with many permutations of the pilot diagnostic instrument. Some versions were shorter, or new items were added or exchanged with existing items. Ratings scales varied as well, using three, four, five or six categories. In 2000 the instrument was finalized with some revisions to the original 52 pilot items using a six-point rating scale.

3. Method

Some research situations require direct observations which are then recorded by a rater/judge who uses a rubric to assess the activities under investigation. Pendrill states "The Rasch approach...is not simply a mathematical or statistical approach, but instead [is] a specifically metrological approach to human-based measurement." [10, 26] The multi-faceted extension of the Rasch model solves the problem of subjective ratings by conditioning the raw scores into objective measures. One of the problems with rater mediated data is that people do not always view things in the same way and may have different levels of severity when rating the same phenomenon. One person’s rating of “3” could very well be harder to attain than another person’s “4” on the rating scale. Although inter-rater reliability is an important goal, the most essential issue is intra-rater consistency. When raters are internally consistent, then their relative severity levels can be accounted for in the results when using the multi-faceted model.

The FACETS computer program version 3.8.0 [7] was used to analyze the data. Additional analyses were performed using SPSS 18. The following model was employed:

$$\log \left( \frac{P_{nmijgik}}{P_{nmijgik} - 1} \right) = B_n - C_j - D_{gi} - F_{gk}$$

$$B_n \quad n = 1 - 1070$$

(speakers/speeches)
4. Results

Data for this study consists of people who participated in a class or workshop and gave at least one persuasive presentation from 2000 to 2015. These presentations were evaluated by instructors, fellow students and independent raters. There were 1,070 presentations given by 739 speakers, rated by 773 raters who evaluated at least 3 presentations using 9,218 of the finalized rating forms. Multifaceted models allow speakers, raters and items to all be along the same line of inquiry. The origin of the scales was changed from the default to a scale centered on 10.00. Table 1 shows the summary statistics, which indicate a satisfactory overall fit of the data to the model.

Table 1 Summary Statistics

| Facet    | N     | Average | Measure | Model SE | SD | Infit | MnSq | Outfit | MnSq | Pt | Bis | Sep | Rel |
|----------|-------|---------|---------|----------|----|-------|------|--------|------|----|-----|-----|-----|
| Items    | 52    | 4.46    | 10.00   | 0.01     | 0.41| 1.00  | 1.01 | 0.44   | 29.30| 1.00|
| Raters   | 776   | 4.46    | 10.00   | 0.08     | 0.80| 1.05  | 1.04 | 0.30   | 9.57 | 0.99|
| Speeches | 1070  | 4.48    | 11.53   | 0.07     | 0.78| 0.96  | 0.96 | 0.33   | 9.82 | 0.99|

One of the first things to check is whether the rating scale is working properly [21]. The probability curves for the six-point scale show all category measures and thresholds are ordered, expected is close to observed, and the mean squares are well behaved. Figure 1 illustrates the importance of modeling each identifiable facet affecting the measures, which accounts for rater differences, rather than simply assuming raw score averages, for assessment purposes. Of course, the measures are drawn from the raw scores so there is a high correlation between measures and scores.

However, in some cases there is a substantial disparity. One hundred presentations were randomly selected from the data. Thirty presentations were then randomly chosen from that group to create a scatterplot of raw scores and measures. As one can see, some presentations do not have raw scores and measures that lineup. For instance, presentations 1, 21, 28 and 10 all have an average raw score of 4.01. Yet, when the difficulty of the items and the severity of the raters are taken into account, the measures are quite different: 9.91, 10.26, 10.66 and 11.15 respectively. Another example shows two presentations, 11 and 28, with the same measure of 10.66, yet the raw scores are 4.72 and 4.01.

![Persuasive Presentations: Raw Scores x Measures](image)

Figure 1 Persuasive Presentations: Raw Scores x Measures

The construct for persuasive presentation communication competencies is stable. The diagnostic tool to evaluate speeches and to calibrate the competencies necessary to be effective was first developed and
piloted in 1991. Two hundred seventy-nine rating forms for 31 speeches were filled out by the two instructors and 14 class members using a 4-point scale. Those item measures were compared to the measures from the current analysis with data from 2000 – 2015; about 35 times more data than the pilot. Figure 2 is a graphic representation of the .918 correlation of the 52 competencies from the two different data sets.

Figure 2 Communication Competencies Pilot 1991 x Data 2000-2015

An examination of rater behaviour shows the majority are internally consistent. Examining the various fit statistics reveals that about 85% of the raters maintain a frame of reference that makes their judgements useful, consistent and reliable.

The average ability measure of all 1,070 presentations is 11.53, about a logit and a half above the theoretical person of average ability. This makes sense because all participants are college graduates, many with advanced degrees, who are a cross section of mid-career urban professionals such as attorneys, engineers, accountants, sales and marketing experts. The goal of any course is demonstrable improvement. Two hundred seventy-seven participants gave two presentations. The mean measure of the first speech is 11.25, and the second is 11.82; a gain of .57, or more than half a logit. A paired samples t-test statistic of -14.43 (.000 significance) confirms the fact this progress is not due to chance.

The competency items covered the range of the variable without significant misfit. All items had both infit and outfit mean squares between .72 and 1.30; point biserial correlation was .51 to .37 with only four items below .40; the estimated discrimination ranged from 1.29 to .67 with only 2 items less than .80. Thus this data set from the persuasive presentation evaluation instrument is proven valid and reliable.

5. Discussion
A map of communication competencies for persuasive presentations is a useful tool for both instructor and learner. Understanding the scientific structure of persuasive presentations allows rhetorical choices and decisions to be based on the facts of measurement. Figure 3, The Communication Competency Map, [22] [23] shows the hierarchy of proficiencies required to give a good presentation. It helps with understanding the construction of an effective presentation, and to identify the items which transform a competent speech into an excellent speech. Assessment is appropriately targets, based on educational level, professional objective and personal goals.

When a student is given diagnostic feedback with the overall and subscale measures for a persuasive presentation, it is a personalized guide for improvement. The distribution graph helps the student acquire
Figure 3. Communication Competency Map
a frame of reference for his or her performance. This information contributes to the gain in knowledge, skills and abilities required to give a successful presentation. Many of the competencies necessary in persuasive presentation are transferable to other types of communication. They can be used to assess interpersonal skills, teamwork, leadership, professionalism or other needs. Currently there is a study being conducted measuring physician patient interaction. Much remains to be done to fully realize the value of calibrating communication competencies to a linear unit of comparison that takes rater variation into account. "Without access to recognized metrological standards, it will be difficult to judge objectively the relative levels of quality of products and services appraised by humans.... Fortunately, it turns out that the Rasch approach, with its explicit separation of person and item attribute estimation, is well suited for introducing metrological traceability to human-based measurement." [9, 28]

The value of having a calibrated diagnostic tool lies in its application. It allows researchers to be able to objectively compare results from time to time and group to group. It allows standards to be set for required proficiency at various job and professional levels. The communication of communication competence transcends all disciplines, for it is fundamental to successfully create understanding.

References

[1] G Rasch 1960 Probabilistic models for some intelligence and attainment tests (Reprint, with Foreword and Afterword by B. D. Wright, Chicago: University of Chicago Press, 1980) (Copenhagen, Denmark: Danmarks Paedagogiske Institut)
[2] B D Wright and M H Stone 1979 Best test design: Rasch measurement (Chicago, Illinois: MESA Press)
[3] B D Wright and G N Masters 1982 Rating scale analysis: Rasch measurement (Chicago, Illinois: MESA Press)
[4] E B Andersen 1973 British J Math Stat Psychol 26 31-44
[5] D Andrich 1978 Psychometrika 43 561-573
[6] G H Fischer 1973 Acta Psychologica 37 359-374
[7] J M Linacre 1989 Many-facet Rasch measurement (Chicago, Illinois: MESA Press)
[8] L Pendrill 2014 Man as a measurement instrument [Special Feature]. NCSLi Measure: The Journal of Measurement Science 9 22-33
[9] Aristotle Rhetoric (Trans. W.Rhys Roberts 1954. New York: Modern Library)
[10] B Magill, et al. Am Business Communic Assoc Bullet Vol? 31-33
[11] http://online.wsj.com/documents/topschools2001.htm
[12] http://www.abms.org/board-certification/a-trusted-credential/based-on-core-competencies/
[13] https://www.aamc.org/initiatives/admissionsinitiative/competencies/
[14] https://www.shrm.org/research/articles/articles/pages/leadershipcompetencies.aspx
[15] http://money.usnews.com/money/blogs/outside-voices-careers/2014/12/10/the-top-10-skills-you-need-to-be-successful
[16] https://targetjobs.co.uk/careers-advice/career-planning/273051-the-top-10-skills-thatll-get-you-a-job-when-you-graduate
[17] http://youremployment.biz/competency/examples-of-competencies/
[18] E Riggio April 27, 2014 The Top 10 Leadership Competencies
https://www.psychologytoday.com/blog/cutting-edge-leadership/201404/the-top-10-leadership-competencies
[19] D. Surges Tatum 1991 A measurement system for speech evaluation (University of Chicago: unpublished dissertation)
[20] A H Monroe 1935 Principles and types of speech (New York: Scott, Foresman, and Co.)
[21] Linacre 1999 J Outcome Meas 3 103-122
[22] D Surges Tatum 2001 Persuasive communication: business & professional speaking (Chicago, Illinois: Meaningful Measurement)