An alternative to the use of traditional composite scales in creating scales from survey items was developed, using feedback seeking as an example. It is proposed that much more information can be obtained through Rasch techniques about feedback-seeking behaviors related to teaching. Data are from the New Faculty Project involving tenure-track faculty hired in 1991 and 1992 at five institutions in a consortium. Responses from 165 faculty members indicated 9 activities through which faculty members sought feedback about job performance. Instead of creating composite scores in the traditional way, researchers Rasch-calibrated responses using the BIGSTEPS, version 2.65 program. Results show that new faculty members are more likely to monitor the behavior of others than to make inquiries about job performance. Faculty members could be distinguished by their feedback-seeking modes. More information on the relationship between monitoring and feedback and the frequency of feedback was obtained than could be obtained through the traditional use of composite scores. Composite scores made it possible to distinguish those who used a feedback-seeking modes more or less frequently, but not to investigate patterns of feedback seeking. (Contains two tables, four figures, and four references.) (SLD)
Measuring Feedback-Seeking Modes:
An Alternative to Composite Scores

Rita K. Bode
Rehabilitation Institute of Chicago

March 1997

Measuring Feedback-Seeking Modes: An Alternative to Composite Scores

This study illustrates an alternative to the use of traditional composite scores in creating scales from survey items. Traditional composite scores are known to be limited in the amount of information they provide about the individuals measured and the use of Rasch analysis is proposed to more fully describe the behaviors or activities being measured (Wright & Masters, 1982).

The variable dealt with in this study is mode of feedback-seeking. Newcomers in many employment situations deal with anxiety by seeking information on what is expected of them and how well they are doing in their new jobs. Rather than just passively receiving information, these employees seek out information in general and feedback on their performance in specific. Three modes in which information can be sought have been described by Morrison (1993) as follows: consulting written documents for information about expectations, monitoring the behavior of others to obtain information, and making inquiries of colleagues and supervisors to obtain feedback related to performance.

In previous research, Morrison (1993) created a scale consisting of seven items and used it to compare the feedback-seeking modes of newly-hired staff accountants. The response scale represented the frequency with which each behavior was used: from 1 (never) to 7 (several times a day). The items consisted of the following: 1) ask your direct supervisor, 2) ask a more experienced staff accountant, 3) ask another new staff accountant, 4) pay attention to how others behave, 5) socialize with people in the firm in order to learn how they behave and what they value, 6) observe what behaviors are rewarded and use this as a clue to what is desirable or expected, and 7) consult memos, annual reports, or other written material. She used factor analysis to determine the number of scales to be created: the first three items comprised the inquiry scale, the second three comprised the monitor scale, and consult written documents was measured by the last item. A composite score was created for the two scales with Cronbach’s alpha ranging from .60 to .65. Morrison compared the average scale/item scores for feedback about performance and found that new hires monitored significantly more frequently than made inquiries or consulted written documents. In this study, Rasch techniques are used to show how more information can be obtained on feedback-seeking behaviors related to teaching (logistics, expectations, performance, etc.).

METHODS

The data for this study came from the New Faculty Project survey that was sent to tenure-track faculty hired in 1991 and 1992. (The New Faculty Project was supported by the Office of Educational Research and Improvement (OERI) of the United States Department of Education through the National Center on Postsecondary Teaching, Learning, and Assessment (NCTLA), an effort of a consortium of universities located at Pennsylvania State University. The New Faculty Project, based at Northwestern University, was under the direction of Robert J. Menges, Professor of Education and Social Policy.) The measure of feedback seeking was developed for a study of feedback seeking and receiving in newly-hired faculty (Menges, Bode, Reyes, & Letwat, 1996).
Sample

The data for this study came from the New Faculty Project survey that was sent to faculty from two cohorts who were new to their institutions. These faculty came from five institutions: two liberal arts colleges, one community college district, one comprehensive university, and one research university. These faculty were surveyed for three years; responses used in this study came from year three when 252 surveys were mailed and 176 returned. While faculty of all ranks were included in the survey, the sample used in this study were unranked or below the rank of full professors. The data used in this study comes from 165 faculty who responded to at least one item in this set. Of these faculty, 79 were male and 86 were female; 15 were instructors, 80 were assistant professors, 20 were associate professors, 7 were full professors, and the remainder had other ranks or came from institutions with no ranks; 58 had minimal teaching experience (the equivalent of less than 2 years), 55 had moderate teaching experience (the equivalent of between 2 and 6 years), and 46 had extensive teaching experience (the equivalent of more than 7 years). The disciplines these faculty came from were varied but were more likely in the humanities or professions than in the natural or social sciences.

Instruments and Instrumentation

Survey items to assess feedback-seeking mode were adapted from Morrison (1993b). These items asked about the frequency with which new hires sought information from various sources, slightly modified from the earlier application in a business setting to one more appropriate for a postsecondary setting. A source of feedback was added to the item: ask an administrator other than your chair. Feedback-seeking mode thus was measured by an item that included nine activities by which faculty sought feedback. "Other" (option i) was not included in the scaling. The survey item on which this variable was based is as follows:

Think about your teaching and research/creative activities in the past academic year. In trying to figure out how well you were performing your work, how frequently in general did you do the things listed below. Please use the following scale:

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>never</td>
</tr>
<tr>
<td>1</td>
<td>once a month</td>
</tr>
<tr>
<td>2</td>
<td>few times a month</td>
</tr>
<tr>
<td>3</td>
<td>once a week</td>
</tr>
<tr>
<td>4</td>
<td>few times a week</td>
</tr>
<tr>
<td>5</td>
<td>once a day</td>
</tr>
<tr>
<td>6</td>
<td>few times a day</td>
</tr>
</tbody>
</table>

a. ask your chair for feedback  
b. ask a more experienced senior colleague  
c. ask another junior faculty member  
d. ask an administrator other than your chair  
e. pay attention to how colleagues behave  
f. socialize with colleagues to learn how they behave and what they value  
g. observe what behaviors are rewarded and use this as a clue to what is desirable or expected  
h. consult memos, handbooks, or other written documents  
i. other
Instead of creating composite scores a la Morrison, the items were Rasch-calibrated using BIGSTEPS, version 2.65 (Linacre, 1992). Initially all items were calibrated to detect misfitting items; in subsequent analyses of fitting items only, step disorder was examined. The criterion for item misfit was set at a mean square infit statistic greater than 1.3 and step calibrations were examined to identify step disorder. Misfitting items were deleted from the set and step disorder was eliminated by collapsing adjacent categories in which the rating scale was used inconsistently. The standard item map provided in Table 12 of the BIGSTEPS output contains calibrations for a single value in the middle of the response scale (in this case, category 3, once a week). To more fully describe faculty who fell at various positions along the continuum, this item map was expanded using calibrations for each step in the response scale that are provided in Table 2.2 of the BIGSTEPS output.

RESULTS

The initial calibration indicated that one item, consult written documents, misfit the model. While faculty responses to the remaining items fit a general construct of feedback seeking, those for the misfitting item were unexpected—either unexpectedly frequent or unexpectedly infrequent—based on responses to the set of items. This item was thus eliminated from the measure. Step disorder was found at the top of scale; there were inconsistencies in the way that faculty used the categories once a day and a few times a day so these two responses were collapsed. Using a six-step response scale, the remaining six items created a useful measure of feedback-seeking with acceptable item infit and person separation reliability. The summary statistics for the final calibration are presented in Table 1. The calibrations and fit statistics for each item in measure order are presented in Table 2.

Table 1

<table>
<thead>
<tr>
<th>SUMMARY OF 165 MEASURED (NON-EXTREME) PERSONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAW</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>MEAN</td>
</tr>
<tr>
<td>S.D.</td>
</tr>
</tbody>
</table>

MODEL RMSE .46 ADJ.SD .92 SEPARATION 1.99 PERSON RELIABILITY .80
REAL RMSE .55 ADJ.SD .87 SEPARATION 1.58 PERSON RELIABILITY .71
S.E. OF PERSON MEAN .08
WITH 6 EXTREME PERSONS = 171 PERSONS
MODEL RMSE .53 ADJ.SD 1.08 SEPARATION 2.04 PERSON RELIABILITY .81
REAL RMSE .61 ADJ.SD 1.04 SEPARATION 1.72 PERSON RELIABILITY .75

MINIMUM EXTREME SCORE: 6 PERSONS
Table 1, Continued

<table>
<thead>
<tr>
<th>RAW SCORE</th>
<th>COUNT</th>
<th>MEASURE</th>
<th>ERROR</th>
<th>INFIT</th>
<th>MNSQ</th>
<th>2STD</th>
<th>MNSQ</th>
<th>2STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN</td>
<td>257.1</td>
<td>162.6</td>
<td>.00</td>
<td>.09</td>
<td>1.00</td>
<td>-1</td>
<td>1.02</td>
<td>.0</td>
</tr>
<tr>
<td>S.D.</td>
<td>126.9</td>
<td>1.8</td>
<td>1.08</td>
<td>.03</td>
<td>.19</td>
<td>1.6</td>
<td>.14</td>
<td>1.1</td>
</tr>
</tbody>
</table>

MODEL RMSE .10 ADJ SD 1.08 SEPARATION 11.00 ITEM RELIABILITY .99
REAL RMSE .10 ADJ SD 1.08 SEPARATION 10.40 ITEM RELIABILITY .99
S.E. OF ITEM MEAN .44

DELETED: 1 ITEMS

Table 2

<table>
<thead>
<tr>
<th>ENTRY NUM</th>
<th>RAW SCORE</th>
<th>COUNT</th>
<th>MEASURE</th>
<th>ERROR</th>
<th>INFIT</th>
<th>MNSQ</th>
<th>2STD</th>
<th>OUTFIT</th>
<th>MNSQ</th>
<th>2STD</th>
<th>PTBIS</th>
<th>ITEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>51</td>
<td>163</td>
<td>2.14</td>
<td>.16</td>
<td>1.18</td>
<td>1.1</td>
<td>1.20</td>
<td>.9</td>
<td>.33</td>
<td>.51</td>
<td>TCHG--ASK ADMINISTRATOR</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>140</td>
<td>159</td>
<td>.73</td>
<td>.10</td>
<td>.85</td>
<td>-1.2</td>
<td>.99</td>
<td>-1</td>
<td>.51</td>
<td>.51</td>
<td>TCHG--ASK CHAIR</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>206</td>
<td>162</td>
<td>.16</td>
<td>.09</td>
<td>1.20</td>
<td>1.6</td>
<td>1.09</td>
<td>.7</td>
<td>.50</td>
<td>.50</td>
<td>TCHG--ASK OTHER JUNIOR FACULTY</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>237</td>
<td>164</td>
<td>-.03</td>
<td>.08</td>
<td>.68</td>
<td>-3.1</td>
<td>.80</td>
<td>-1.8</td>
<td>.58</td>
<td>.58</td>
<td>TCHG--ASK SENIOR COLLEAGUES</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>368</td>
<td>165</td>
<td>-.85</td>
<td>.08</td>
<td>1.18</td>
<td>1.6</td>
<td>1.21</td>
<td>1.8</td>
<td>.44</td>
<td>.44</td>
<td>TCHG--OBSERVE WHAT IS REWARDED</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>377</td>
<td>163</td>
<td>-.94</td>
<td>.08</td>
<td>1.03</td>
<td>.3</td>
<td>.99</td>
<td>-.1</td>
<td>.53</td>
<td>.53</td>
<td>TCHG--SOCIALIZE WITH COLLEAGUE</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>421</td>
<td>162</td>
<td>-1.21</td>
<td>.08</td>
<td>.90</td>
<td>-1.0</td>
<td>.89</td>
<td>-1.1</td>
<td>.57</td>
<td>.57</td>
<td>TCHG--WATCH HOW COLLEAGUES BEH</td>
<td></td>
</tr>
</tbody>
</table>

MEAN 257.163. .00 .09 1.00 -.1 1.02 .0
S.D. 127.2 .108 .03 .19 1.6 .14 1.1
The original item map is presented in Figure 1. This map shows that faculty in general are more likely to monitor the behavior of others than make inquiries of others which confirms the results obtained by Morrison (1993). However, additional information concerning feedback-seeking is also available from this analysis. For faculty who inquire, the frequency with which they monitor the behavior of others was essentially the same regardless of behavior being monitored but the frequency with which inquiries are made differed across source: faculty were least likely to ask administrators for feedback concerning their teaching performance, more likely to ask their chairs, and most likely to ask their colleagues (either junior or senior faculty).

While this map did provide more information about feedback-seeking than obtained in the previous research, results from Table 2.2 were used to expand the item map and more fully describe feedback-seeking. Figure 2 shows the calibrations for each step in the response scale for each item. Using these calibrations it was possible to illustrate how frequently feedback was sought by creating an expanded item map with descriptors for each response stacked by source.

The expanded item map was used to identify four types of feedback-seekers by referencing the item descriptors. The four types are: faculty who neither monitor nor inquire; faculty who monitor only; faculty who monitor frequently but inquire infrequently; and faculty who monitor and inquire frequently. Specifically, faculty who "neither monitor nor inquire" never seek feedback from any source; they may not feel the need for feedback or possibly were disappointed in the feedback they previously obtained. Faculty who "monitor only" monitor the behavior of others about once a month; they may feel the need for feedback but fear asking for it directly. Faculty who "monitor frequently but inquire infrequently" monitor the behavior of others a few times a month but only ask colleagues once a month and never ask chairs or administrators; they may feel the need for feedback but are only comfortable in seeking it from fellow faculty members. Faculty who "monitor and inquire frequently" monitor the behavior of others from once a week to at least once daily, ask colleagues for feedback from a few times a month to at least once daily, ask their chairs for feedback from once a month to a few times a day, and ask administrators for feedback never to once a week; they feel the need for feedback and appear to have no difficulty in seeking it out from any source.

Discussion

That Rasch calibrations provide more useful information than traditional composite scales is illustrated by a comparison of the information available using these two methods. Using composites, it's possible to distinguish people who used a feedback-seeking mode more or less frequently but not to investigate patterns of feedback-seeking. Because composite scores are ordinal, calculations of means and standard deviations and plotting of frequencies by score are not appropriate. An example of a display of the results using composites is presented in Figure 3. This figure shows boxplots of the distribution of scores along with the median scores for the three feedback-seeking scales used by Morrison (1993): monitoring, inquiring, and consulting. Using this information, it is possible to: 1) compare average values across scales, 2) see how the scores are distributed, and 3) see where the scores for a particular individual fall as compared to this distribution. Using the expanded item map presented
in Figure 2, not only can one determine the extent to which individual faculty sought feedback but one can also determine which feedback-seeking methods they used and how frequently.

Using composites, one loses the information on individual items. Looking at the boxplots gives the impression that there is more variation in frequency of monitoring than inquiry. Using the expanded item map, however, one can see that the differences by sources are in inquiry and not monitoring.

Using composites, it is not possible to detect items with idiosyncratic responses. One item, consult written documents, constituted a separate factor that was moderately related to the other two composites ($r = .37; p = .01$ with inquiry and $r = .22; p = .01$ with monitoring). However, there were no clues as to its misfit. Using Rasch, it was possible to identify the misfit of this item with the other two feedback-seeking modes.

Finally, using composites to measure feedback-seeking, it is not possible to see how monitoring and inquiry are related to each other. The factor analysis performed by Morrison (1993) identified three factors but the correlations among these two composite scores indicate that these are not independent factors ($r = .36; p = .01$). The resulting composite scores also had weak reliability (.60 and .65). The Rasch analysis clearly shows one feedback-seeking construct with good reliability (.80). Using Rasch, it is obvious that monitoring and inquiring are not polar opposites as Morrison’s results suggest. If the relationship between monitoring and inquiry had been examined in previous results, it would have been obvious that the polars were no feedback-seeking and frequent feedback-seeking. The plot of monitoring and inquiry composites is presented in Figure 4. This plot confirms the findings of the Rasch analysis concerning the polars. A regression analysis performed on these data shows an intercept of approximately 1.5 and a slope of approximately 1. These results indicate that faculty monitor more frequently than inquire and this relationship is maintained as frequency of feedback seeking increases. Thus Rasch analysis provided the same information without having to conduct a statistical analysis.

Conclusions

In addition to confirming the conclusions from previous research that newcomers are more likely to monitor behavior than make inquiries of others, the results of this study show that:

1) faculty can be distinguished by their feedback-seeking mode: few do not seek feedback at all; some seek feedback only through monitoring of the behavior of colleagues; the majority of faculty seek feedback from a variety of sources, mainly from monitoring but also to some extent from inquiries of other faculty or administrators; and few faculty frequently seek feedback from multiple sources
2) the more faculty seek feedback, the more frequently both monitoring and inquiry occurs
3) information on the relationship between monitoring and inquiry and on the frequency of feedback seeking from individual sources is more than could be obtained by using traditional composite scores
Figure 1. Original Item Map of Faculty Feedback-Seeking Behavior
<table>
<thead>
<tr>
<th>PERSONS</th>
<th>MONITOR ASK COLLEAGUES ASK CHAIR ASK ADMINISTRATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>at least once daily</td>
</tr>
<tr>
<td>4</td>
<td>at least once daily</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>at least once daily</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>0</td>
<td>S</td>
</tr>
<tr>
<td>-1</td>
<td>H</td>
</tr>
<tr>
<td>-2</td>
<td>S</td>
</tr>
<tr>
<td>-3</td>
<td>X</td>
</tr>
<tr>
<td>-4</td>
<td>XX</td>
</tr>
<tr>
<td>-5</td>
<td>XXX</td>
</tr>
</tbody>
</table>

Figure 2. Expanded Item Map of Faculty Feedback-Seeking Behavior
Figure 3. Distribution of Feedback-Seeking Composite Scores

Figure 4. Plot of Monitor and Inquire Composite Scores

a=1.54
b=0.86
R²=.25
References


I. DOCUMENT IDENTIFICATION:

Title:
Measuring Feedback-Seeking Modes: An Alternative to Composite Scores

Author(s):
Rita K. Bode

Corporate Source:

Publication Date:

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic/optical media, and sold through the ERIC Document Reproduction Service (EDRS) or other ERIC vendors. Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce the identified document, please CHECK ONE of the following options and sign the release below.

Check here

Sample sticker to be affixed to document

“PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC).”

Level 1

or here

Sample sticker to be affixed to document

“PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC).”

Level 2

Sign Here, Please

Documents will be processed as indicated provided reproduction quality permits. If permission to reproduce is granted, but neither box is checked, documents will be processed at Level 1.

“I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce this document as indicated above. Reproduction from the ERIC microfiche or electronic/optical media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.”

Signature: Rita Bode

Printed Name: Rita Bode

Address: 1623 North Thatcher Avenue

Elmwood Park IL 60707

Position: Post Doctoral Fellow

Organization: Rehabilitation Institute of Chicago

Telephone Number: (312) 908-0713

Date: March 26, 1997
February 21, 1997

Dear AERA Presenter,

Congratulations on being a presenter at AERA\(^1\). The ERIC Clearinghouse on Assessment and Evaluation invites you to contribute to the ERIC database by providing us with a printed copy of your presentation.

Abstracts of papers accepted by ERIC appear in *Resources in Education (RIE)* and are announced to over 5,000 organizations. The inclusion of your work makes it readily available to other researchers, provides a permanent archive, and enhances the quality of *RIE*. Abstracts of your contribution will be accessible through the printed and electronic versions of *RIE*. The paper will be available through the microfiche collections that are housed at libraries around the world and through the ERIC Document Reproduction Service.

We are gathering all the papers from the AERA Conference. We will route your paper to the appropriate clearinghouse. You will be notified if your paper meets ERIC's criteria for inclusion in *RIE*: contribution to education, timeliness, relevance, methodology, effectiveness of presentation, and reproduction quality. You can track our processing of your paper at http://ericae2.educ.cua.edu.

Please sign the Reproduction Release Form on the back of this letter and include it with two copies of your paper. The Release Form gives ERIC permission to make and distribute copies of your paper. It does not preclude you from publishing your work. You can drop off the copies of your paper and Reproduction Release Form at the ERIC booth (523) or mail to our attention at the address below. Please feel free to copy the form for future or additional submissions.

Mail to: AERA 1997/ERIC Acquisitions
The Catholic University of America
O'Boyle Hall, Room 210
Washington, DC 20064

This year ERIC/AE is making a **Searchable Conference Program** available on the AERA web page (http://aera.net). Check it out!

Sincerely,

Lawrence M. Rudner, Ph.D.
Director, ERIC/AE

\(^1\)If you are an AERA chair or discussant, please save this form for future use.