Measurement and Scaling

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2012-03-29
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<th>日期</th>
<th>內容（Subject/Topics）</th>
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<td>18</td>
<td>101/06/14</td>
<td>Term Project Presentation Presentation 2</td>
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Outline

• A paradigm for developing better measures of marketing constructs
• Current practice in scale development
• The linkage among attitudes, behavior, and marketing effectiveness
• Measurement Scales
A paradigm for developing better measures of marketing constructs

Churchill, G. A., Jr., (1979),
A paradigm for developing better measures of marketing constructs.
*Journal of Marketing Research*, 16(February), 64-73.
Suggested Procedure for Developing Better Measures

1. Specify domain of construct
2. Generate sample of items
3. Collect data
4. Purify measure
5. Collect data
6. Assess reliability
7. Assess validity
8. Develop norms

Recommended Coefficients or Techniques

- Literature search
- Literature search
- Experience survey
- Insight stimulating examples
- Critical incidents
- Focus groups
- Coefficient alpha
- Factor analysis
- Coefficient alpha
- Split-half reliability
- Multitrait-multimethod matrix
- Criterion validity
- Average and other statistics summarizing distribution of scores

(Churchill, 1979) (A Paradigm for Developing Better Measures of marketing Constructs)
Suggested Procedure for Developing Better Measures (Churchill, 1979)

Procedure

1. Specify domain of the construct
2. Generate sample of Items
3. Collect data
4. Purify measure
5. Collect data
6. Assess reliability
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- Factor analysis
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- Criterion validity
- Average and other statistics summarizing distribution of scores

(Churchill, 1979) (A Paradigm for Developing Better Measures of marketing Constructs)
The Problem and Approach

• Developing measures which have desirable reliability and validity properties
• The process of measurement of operationalization involves “rules for assigning numbers to objects to represent quantities of attributes”.
• Consider some arbitrary construct, C, such as customer satisfaction.

\[ X_0 = X_T + X_S + X_R \]

- \( X_0 \) = Observed score
- \( X_T \) = True score
- \( X_S \) = Systematic sources of error
- \( X_R \) = Random sources of error
Scale Development
Example from (Davis, 1989)

• Scale Development and Pretest
  – A step-by-step process was used to develop new multi-item scales having high reliability and validity.
  – The conceptual definitions of perceived usefulness and perceived ease of use, stated above, were used to generate 14 candidate items for each construct from past literature.
  – Pretest interviews were then conducted to assess the semantic content of the items. Those items that best fit the definitions of the constructs were retained, yielding 10 items for each construct.
  – Next, a field study (Study 1) of 112 users concerning two different interactive computer systems was conducted in order to assess the reliability and construct validity of the resulting scales.
  – The scales were further refined and streamlined to six items per construct. A lab study (Study 2) involving 40 participants and two graphics systems was then conducted.
  – Data from the two studies were then used to assess the relationship between usefulness, ease of use, and self-reported usage.
1. Specify Domain of the Construct

• Theoretical Definition
  – Perceived Usefulness:
    • The degree to which a person believes that using a particular system would enhance job performance
  – Perceived Ease of Use:
    • The degree to which a person believes that using a particular system would be free of effort.

Example from (Davis, 1989)
2. Generate Sample of Items

• Literature search
• Experience survey
• Insight stimulating examples
• Critical incidents
• Focus groups
2. Generate Sample of Items (Cont.)

Table 1. Initial Scale Items for Perceived Usefulness

1. My job would be difficult to perform without electronic mail.
2. Using electronic mail gives me greater control over my work.
4. The electronic mail system addresses my job-related needs.
5. Using electronic mail saves me time.
6. Electronic mail enables me to accomplish tasks more quickly.
7. Electronic mail supports critical aspects of my job.
8. Using electronic mail allows me to accomplish more work than would otherwise be possible.
9. Using electronic mail reduces the time I spend on unproductive activities.
10. Using electronic mail enhances my effectiveness on the job.
11. Using electronic mail improves the quality of the work I do.
12. Using electronic mail increases my productivity.
13. Using electronic mail makes it easier to do my job.
14. Overall, I find the electronic mail system useful in my job.

Table 2. Initial Scale Items for Perceived Ease of Use

1. I often become confused when I use the electronic mail system.
2. I make errors frequently when using electronic mail.
3. Interacting with the electronic mail system is often frustrating.
4. I need to consult the user manual often when using electronic mail.
5. Interacting with the electronic mail system requires a lot of my mental effort.
6. I find it easy to recover from errors encountered while using electronic mail.
7. The electronic mail system is rigid and inflexible to interact with.
8. I find it easy to get the electronic mail system to do what I want it to do.
9. The electronic mail system often behaves in unexpected ways.
10. I find it cumbersome to use the electronic mail system.
11. My interaction with the electronic mail system is easy for me to understand.
12. It is easy for me to remember how to perform tasks using the electronic mail system.
13. The electronic mail system provides helpful guidance in performing tasks.
14. Overall, I find the electronic mail system easy to use.

Example from (Davis, 1989)
4. Purify the Measure

Table 3. Pretest Results: Perceived Usefulness

<table>
<thead>
<tr>
<th>Old Item #</th>
<th>Item</th>
<th>Rank</th>
<th>New Item #</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Job Difficult Without</td>
<td>13</td>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>Control Over Work</td>
<td>9</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>Job Performance</td>
<td>2</td>
<td>12</td>
<td>C</td>
</tr>
<tr>
<td>4</td>
<td>Addresses My Needs</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Saves Me Time</td>
<td>11</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Work More Quickly</td>
<td>7</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>7</td>
<td>Critical to My Job</td>
<td>5</td>
<td>4</td>
<td>C</td>
</tr>
<tr>
<td>8</td>
<td>Accomplish More Work</td>
<td>6</td>
<td>7</td>
<td>B</td>
</tr>
<tr>
<td>9</td>
<td>Cut Unproductive Time</td>
<td>10</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>10</td>
<td>Effectiveness</td>
<td>1</td>
<td>8</td>
<td>A</td>
</tr>
<tr>
<td>11</td>
<td>Quality of Work</td>
<td>3</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>12</td>
<td>Increase Productivity</td>
<td>4</td>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>13</td>
<td>Makes Job Easier</td>
<td>8</td>
<td>9</td>
<td>C</td>
</tr>
<tr>
<td>14</td>
<td>Useful</td>
<td>NA</td>
<td>10</td>
<td>NA</td>
</tr>
</tbody>
</table>

Table 4. Pretest Results: Perceived Ease of Use

<table>
<thead>
<tr>
<th>Old Item #</th>
<th>Item</th>
<th>Rank</th>
<th>New Item #</th>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Confusing</td>
<td>7</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>Error Prone</td>
<td>13</td>
<td>3</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Frustrating</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Dependence on Manual</td>
<td>9</td>
<td>(replace)</td>
<td>C</td>
</tr>
<tr>
<td>5</td>
<td>Mental Effort</td>
<td>5</td>
<td>7</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>Error Recovery</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Rigid &amp; Inflexible</td>
<td>6</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>8</td>
<td>Controllable</td>
<td>1</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>9</td>
<td>Unexpected Behavior</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Cumbersome</td>
<td>2</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>11</td>
<td>Understandable</td>
<td>4</td>
<td>8</td>
<td>B</td>
</tr>
<tr>
<td>12</td>
<td>Ease of Remembering</td>
<td>8</td>
<td>6</td>
<td>C</td>
</tr>
<tr>
<td>13</td>
<td>Provides Guidance</td>
<td>12</td>
<td>(replace)</td>
<td>C</td>
</tr>
<tr>
<td>14</td>
<td>Easy to Use</td>
<td>NA</td>
<td>10</td>
<td>NA</td>
</tr>
<tr>
<td>NA</td>
<td>Ease of Learning</td>
<td>NA</td>
<td>2</td>
<td>NA</td>
</tr>
<tr>
<td>NA</td>
<td>Effort to Become Skillful</td>
<td>NA</td>
<td>9</td>
<td>NA</td>
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</table>
6. Assess Reliability with New Data

Table 6. Factor Analysis of Perceived Usefulness and Ease of Use Questions: Study 1

<table>
<thead>
<tr>
<th>Scale Items</th>
<th>Factor 1 (Usefulness)</th>
<th>Factor 1 (Ease of Use)</th>
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</thead>
<tbody>
<tr>
<td><strong>Usefulness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Quality of Work</td>
<td>.80</td>
<td>.10</td>
</tr>
<tr>
<td>2 Control over Work</td>
<td>.86</td>
<td>-.03</td>
</tr>
<tr>
<td>3 Work More Quickly</td>
<td>.79</td>
<td>.17</td>
</tr>
<tr>
<td>4 Critical to My Job</td>
<td>.87</td>
<td>-.11</td>
</tr>
<tr>
<td>5 Increase Productivity</td>
<td>.87</td>
<td>.10</td>
</tr>
<tr>
<td>6 Job Performance</td>
<td>.93</td>
<td>-.07</td>
</tr>
<tr>
<td>7 Accomplish More Work</td>
<td>.91</td>
<td>-.02</td>
</tr>
<tr>
<td>8 Effectiveness</td>
<td>.96</td>
<td>-.03</td>
</tr>
<tr>
<td>9 Makes Job Easier</td>
<td>.80</td>
<td>.16</td>
</tr>
<tr>
<td>10 Useful</td>
<td>.74</td>
<td>.23</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Cubersome</td>
<td>.00</td>
<td>.73</td>
</tr>
<tr>
<td>2 Ease of Learning</td>
<td>.08</td>
<td>.60</td>
</tr>
<tr>
<td>3 Frustrating</td>
<td>.02</td>
<td>.65</td>
</tr>
<tr>
<td>4 Controllable</td>
<td>.13</td>
<td>.74</td>
</tr>
<tr>
<td>5 Rigid &amp; Inflexible</td>
<td>.09</td>
<td>.54</td>
</tr>
<tr>
<td>6 Ease of Remembering</td>
<td>.17</td>
<td>.62</td>
</tr>
<tr>
<td>7 Mental Effort</td>
<td>-.07</td>
<td>.76</td>
</tr>
<tr>
<td>8 Understandable</td>
<td>.29</td>
<td>.64</td>
</tr>
<tr>
<td>9 Effort to Be Skillful</td>
<td>-.25</td>
<td>.88</td>
</tr>
<tr>
<td>10 Easy to Use</td>
<td>.23</td>
<td>.72</td>
</tr>
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Example from (Davis, 1989)
6. Assess Reliability with New Data (cont.)

Table 7. Factor Analysis of Perceived Usefulness and Ease of Use Items: Study 2

<table>
<thead>
<tr>
<th>Scale Items</th>
<th>Factor 1 (Usefulness)</th>
<th>Factor 2 (Ease of Use)</th>
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<tbody>
<tr>
<td><strong>Usefulness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Work More Quickly</td>
<td>.91</td>
<td>.01</td>
</tr>
<tr>
<td>2 Job Performance</td>
<td>.98</td>
<td>-.03</td>
</tr>
<tr>
<td>3 Increase Productivity</td>
<td>.98</td>
<td>-.03</td>
</tr>
<tr>
<td>4 Effectiveness</td>
<td>.94</td>
<td>.04</td>
</tr>
<tr>
<td>5 Makes Job Easier</td>
<td>.95</td>
<td>-.01</td>
</tr>
<tr>
<td>6 Useful</td>
<td>.88</td>
<td>.11</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Easy to Learn</td>
<td>-.20</td>
<td>.97</td>
</tr>
<tr>
<td>2 Controllable</td>
<td>.19</td>
<td>.83</td>
</tr>
<tr>
<td>3 Clear &amp; Understandable</td>
<td>-.04</td>
<td>.89</td>
</tr>
<tr>
<td>4 Flexible</td>
<td>.13</td>
<td>.63</td>
</tr>
<tr>
<td>5 Easy to Become Skillful</td>
<td>.07</td>
<td>.91</td>
</tr>
<tr>
<td>6 Easy to Use</td>
<td>.09</td>
<td>.91</td>
</tr>
</tbody>
</table>

Example from (Davis, 1989)
7. Assess Construct Validity

- Multitrait-multimethod matrix
- Criterion validity
1. Entries in the validity diagonal (3) should be higher than the correlations that occupy the same row and column in the heteromethod block (4). This is a minimum requirement.

2. The validity coefficients (3) should be higher than the correlations in the heterotrait-monomethod triangles (2) which suggests that the correlation within a trait measured by different methods must be higher than the correlations between traits which have method in common.

3. The pattern of correlations should be the same in all of the heterotrait triangles, e.g., both (2) and (4).

(Churchill, 1979)(A Paradigm for Developing Better Measures of marketing Constructs)
Does the Measure as Expected?  
(Churchill, 1979)

• Four separate propositions  (Nunnally, 1967, p. 93)
  – 1. The constructs job satisfaction (A) and likelihood of quitting (B) are related.
  – 2. The scale X provides a measure of A.
  – 3. Y provides a measure of B.
  – 4. X and Y correlate positively.
• Only the fourth proposition is directly examined with empirical data.
• To establish that X truly measures A, one must assume that propositions 1 and 3 are correct.
• One must have a good measure for B, and the theory relating A and B must be true.
• The analyst tries to establish the construct validity of a measure by relating it to a number of other constructs and not simply one.
7. Assess Construct Validity

Table 8. Correlations Between Perceived Usefulness, Perceived Ease of Use, and Self-Reported System Usage

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Usefulness &amp; Usage</th>
<th>Ease of Use &amp; Usage</th>
<th>Ease of Use &amp; Usefulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Mail (n=109)</td>
<td>.56***</td>
<td>.32***</td>
<td>.56***</td>
</tr>
<tr>
<td>XEDIT (n=75)</td>
<td>.68***</td>
<td>.48***</td>
<td>.69***</td>
</tr>
<tr>
<td>Pooled (n=184)</td>
<td>.63***</td>
<td>.45***</td>
<td>.64***</td>
</tr>
<tr>
<td>Study 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart-Master (n=40)</td>
<td>.71***</td>
<td>.25</td>
<td>.25</td>
</tr>
<tr>
<td>Pendraw (n=40)</td>
<td>.59***</td>
<td>.47***</td>
<td>.38**</td>
</tr>
<tr>
<td>Pooled (n=80)</td>
<td>.85***</td>
<td>.59***</td>
<td>.56***</td>
</tr>
<tr>
<td>Davis, et al. (1989) (n=107)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave 1</td>
<td>.65***</td>
<td>.27**</td>
<td>.10</td>
</tr>
<tr>
<td>Wave 2</td>
<td>.70***</td>
<td>.12</td>
<td>.23**</td>
</tr>
</tbody>
</table>

*** p<.001   ** p<.01   * p<.05

Example from (Davis, 1989)
7. Assess Construct Validity (cont.)

Table 9. Regression Analyses of the Effect of Perceived Usefulness and Perceived Ease of Use on Self-Reported Usage

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Usefulness</th>
<th>Ease of Use</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Mail (n = 109)</td>
<td>.55***</td>
<td>.01</td>
<td>.31</td>
</tr>
<tr>
<td>XEDIT (n = 75)</td>
<td>.69***</td>
<td>.02</td>
<td>.46</td>
</tr>
<tr>
<td>Pooled (n = 184)</td>
<td>.57***</td>
<td>.07</td>
<td>.38</td>
</tr>
<tr>
<td><strong>Study 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart-Master (n = 40)</td>
<td>.69***</td>
<td>.08</td>
<td>.51</td>
</tr>
<tr>
<td>Pendraw (n = 40)</td>
<td>.76***</td>
<td>.17</td>
<td>.71</td>
</tr>
<tr>
<td>Pooled (n = 80)</td>
<td>.75***</td>
<td>.17*</td>
<td>.74</td>
</tr>
<tr>
<td><strong>Davis, et al. (1989) (n = 107)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 1 Hour</td>
<td>.62***</td>
<td>.20***</td>
<td>.45</td>
</tr>
<tr>
<td>After 14 Weeks</td>
<td>.71***</td>
<td>-.06</td>
<td>.49</td>
</tr>
</tbody>
</table>

*** p<.001  ** p<.01  * p<.05
Final Measurement Scales for Perceived Usefulness and Perceived Ease of Use

Perceived Usefulness

Using CHART-MASTER in my job would enable me to accomplish tasks more quickly.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Using CHART-MASTER would improve my job performance.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Using CHART-MASTER in my job would increase my productivity.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Using CHART-MASTER would enhance my effectiveness on the job.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Using CHART-MASTER would make it easier to do my job.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

I would find CHART-MASTER useful in my job.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Perceived Ease of Use

Learning to operate CHART-MASTER would be easy for me.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

I would find it easy to get CHART-MASTER to do what I want it to do.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

My interaction with CHART-MASTER would be clear and understandable.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

I would find CHART-MASTER to be flexible to interact with.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

It would be easy for me to become skillful at using CHART-MASTER.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

I would find CHART-MASTER easy to use.
likely [ ] [ ] [ ] [ ] [ ] unlikely
eextremely | quite | slightly | neither | slightly | quite | extremely

Example from (Davis, 1989)
8 Developing Norms

• A better way of assessing the position of the individual on the characteristic is to compare the person’s score with the score achieved by other people.

• Norm quality is a function of both the number of cases on which the average is based and their representativeness.
Summary of Suggested Procedure for Developing Better Measures
(Churchill, 1979)

• Researchers doing applied work and practitioners could at least be expected to complete the process through step 4.

• Marketing researchers are already collecting data relevant to steps 5-8.
Current Practice in Scale Development


Suggested Procedure for Developing Better Measures (Churchill, 1979)

1. Specify domain of construct
2. Generate sample of items
3. Collect data
4. Purify measure
5. Collect data
6. Assess reliability
7. Assess validity
8. Develop norms

Recommended Coefficients or Techniques

- Literature search
- Experience survey
- Insight stimulating examples
- Critical incidents
- Focus groups
- Coefficient alpha
- Factor analysis
- Split-half reliability
- Multitrait-multimethod matrix
- Criterion validity
- Average and other statistics summarizing distribution of scores

(Churchill, 1979) (A Paradigm for Developing Better Measures of marketing Constructs)
Current Practice in Scale Development

(Churchill, 1979)

Figure 3.1
Churchill’s (1980) Scale Development Procedure
Adapted from Churchill (1979)

Figure 3.2
Gerbing & Anderson's (1988) Updated Paradigm
Figure 3.3
DeVellis’s (1991) Scale Development Approach

**Figure 3.4**

*Spector's (1992) Summated Rating Scale Development Procedure*

*Adapted from Spector (1992)*
(Netemeyer et al., 2003)

**STEP 1**
Construct Definition

- Delimit construct domain
- Theoretical Definition
- Theoretical Dimensionality

**STEP 2**
Generating and Judging Items

- Domain Sampling
  - Generate an Item Pool
    - Item Sources
    - Item Writing
    - Number of Items
- Judge Items
  - Content Validity
  - Face Validity

**STEP 3**
Designing & Conducting Studies to Develop a Scale

- Pilot Test
- Initial Validation Studies
  - Include Constructs
  - EFA
  - Coefficient Alpha
  - Item to Total Correlations
  - Item Reduction

- EFA & Item Statistics
  - Item Reduction
- CFA
  - Fit Indices
  - Significant Parameter Estimates
  - Composite (construct) Reliability
  - Average Variance Extracted
  - Residuals & Modification Indices
  - Measurement Invariance
- Validity
  - Convergent & Discriminant
  - Predictive & Concurrent
- Norms
  - Means & Standard Deviations

**STEP 4**
Administration & Item Analysis

Figure 3.5
Netemeyer, Bearden, & Sharma’s (2003) Scaling Procedure

Figure 3.6
Adapted from Rossiter (2002)
C-OAR-SE procedure

• Rossiter (2002) laments that the current scale paradigm places too much emphasis on empiricism (i.e., factor analysis and reliability), which leads deletion of conceptually necessary items and retention of conceptually inappropriate items.

• The emphasis in the C-OAR-SE procedure is on content validity (Rossiter, 2002).
Figure 3.7
Amalgamated Scale Development Procedure

研究方法與工具

1. 文獻探討
2. 文獻蒐尋
3. 經驗調查
4. 內容效度比率 (CVR)
5. 抽樣
6. Cronbach’s α係數
7. 相關係數矩陣
8. Item-to-Total相關法
9. 抽樣
10. 因素分析
11. Cronbach’s α係數
12. Item-to-Total相關法
13. 相關係數矩陣
14. 多特質多方法矩陣 (MTMM)
15. Pearson積差相關係數
16. 中位數
17. 百分位數
18. 標準差
19. 平均數
20. 期望常態分配

研究流程

1. 構念定義
2. 問項發展
3. 資料蒐集
4. 量表精鍊
5. 資料再蒐集
6. 量表再精鍊
7. 效度評估
8. 發展常模

研究內容

1. 領域界定
2. 彙整構念之關係面向
3. 構念之定義
4. 發展問項集合 (初始問項)
5. 決定量表格式
6. 確保內容效度
7. 加入效度評估問項
8. 決定抽樣方法
9. 決定樣本規模
10. 針對小樣本進行預試
11. 信度與構念效度分析
12. 刪除不良問項確保構念效度
13. 決定抽樣方法
14. 決定樣本規模
15. 針對大樣本進行預試
16. 驗證內容效度
17. 驗證構念效度
18. 驗證法理效度
19. 發展測量評估標準
20. 樣本分數之統計分配

(Source: 賴榮裕，2006; adapted from Churchill Jr., 1979)
研究流程

1. 構念定義
2. 問題發展
3. 資料蒐集
4. 量表精煉
5. 資料再蒐集
6. 信度評估
7. 效度評估
8. 發展常模

研究方法與工具

- 文獻探討
- 文獻蒐尋
- 經驗調查
- 專家意見
- 焦點群體
- 內容效度比率(CVR)
- 表面效度
- 項目分析(Item Analysis)
- 探索性因素分析 (EFA)
- Cronbach’s α係數
- 相關係數矩陣
- Item-to-Total相關法
- 探索性因素分析 (EFA)
- Cronbach’s α係數
- Item-to-Total相關法
- 驗證性因素分析(CFA)
- 相關係數矩陣
- 多特質多方法矩陣(MTMM)
- Pearson積差相關係數
- 驗證性因素分析(CFA)(SEM)
- 中位數
- 百分位數
- 標準差
- 平均數
- 期望常態分配

研究內容

- 領域界定
- 歸納構念之關係面向
- 構念之定義
- 發展問題集合(初始問題)
- 決定向量表格式
- 確保內容效度
- 加入效度評估問題
- 決定向抽樣方法
- 決定向樣本規模
- 針對小樣本進行預試
- 決定向抽樣方法
- 決定向樣本規模
- 針對大樣本進行預試
- 信度與構念效度分析
- 刪除不良問題確保構念效度
- 驗證內容效度
- 驗證構念效度
- 驗證法理效度
- 發展測量評估標準
- 樣本分析數統計分配

(adapted from 賴榮裕, 2006; Netemeyer et al., 2003; Spector, 1992; DeVellis, 1991; Gerbin & Anderson, 1988; Churchill Jr., 1979)
Summary of Best practices for scale development

• Follow the paradigm for developing better measures (Churchill, 1978; Gerbing, D. W., & Anderson) and best practices for scale development (Netemeyer et al., 2003; Spector, 1992; DeVellis, 1991).
The linkage among attitudes, behavior, and marketing effectiveness
Attitudes and Linkage

• Attitude defined:
  – Enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of a person’s environment.
  
  – Level of Customer Involvement
  – Attitude Measurement & Strength
  – Effects of Other People & Brands
  – Situational Factors

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Measurement Scales

• Scaling defined:
  – Procedures for assigning numbers (or other symbols) to properties of an object in order to impart some numerical characteristics to the properties in question.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Measurement Scales

• Scaling Approaches:
  – Unidimensional:
    • Measures only one attribute of a concept, respondent, or object.
  – Multidimensional:
    • Measures several dimensions of a concept, respondent, or object.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Measurement Scales

• Types of Scales:
  – Noncomparative Scale:
    • Scales in which judgment is made without reference to another object, concept, or person.
  – Comparative Scale:
    • Scales in which one object, concept, or person is compared with another on a scale.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Graphic Rating Scales

• Measurement scales that include a graphic continuum, anchored by two extremes.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Graphic Rating Scales

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Itemized Rating Scales

• The respondent selects an answer from a limited number of ordered categories.

Odd Scale

Important

1  2  3  4  5

Not Important

Even Scale

Important

1  2  3  4  5  6

Not Important

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
## Itemized Rating Scales

### Exhibit 11.2

**Itemized Rating Scales Used in Internet and Mall Surveys**

If offered, how likely would you be to use the following areas on this site?

<table>
<thead>
<tr>
<th>Scale A</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Auctions</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>b. Fee-based education tools</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>c. Event registration</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>d. Online shopping markets</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>e. Recruiting</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>f. Research subscription</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>g. Trading community</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
<tr>
<td>h. Training/seminars</td>
</tr>
<tr>
<td>Not at all likely to use</td>
</tr>
<tr>
<td>01 02 03 04 05 06 07</td>
</tr>
<tr>
<td>Extremely likely to use</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Itemized Rating Scales

What factors influence your choice of music Web sites? (Rate the importance of each item.)

<table>
<thead>
<tr>
<th>Customer benefits or rewards for shopping</th>
<th>Not at All Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer service or delivery options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of use of Web site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real-time audio sampling of CDs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reviews and artist information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scale D

How interested would you be in obtaining additional information about this customer relationship management solution for your business?

- Extremely Interested
- Somewhat Interested
- Not at all Interested
- Very Interested
- Not very interested

How likely is it that your business will invest in this type of customer relationship management solution within the next 12 months?

- Extremely likely
- Somewhat likely
- Not at all likely
- Very likely
- Not very likely

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Itemized Rating Scales

Submitting a Request for a Hotel Reservation

We'd like to get your feedback regarding your experience in submitting a request for a hotel reservation at our website today. Please rate your satisfaction with each of the following aspects of fasthotels.com based on your experience this visit.

<table>
<thead>
<tr>
<th>Ability to access the offer page</th>
<th>Very Satisfied</th>
<th>Very Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ability to locate hotel information</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Ability to locate city information</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Clarity of how the bonus program works
Clarity of the purchase agreement

Please rate the extent to which you are satisfied that Fasthotels.com has communicated each of the following to you during this visit:

<table>
<thead>
<tr>
<th>Your hotel reservation is/will be nonchangeable</th>
<th>Very Satisfied</th>
<th>Very Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Your hotel reservation is/will be nonrefundable</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

How satisfied would you say you were with this visit to Fasthotels.com?

- Very satisfied
- Satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Dissatisfied
- Very dissatisfied

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
### Itemized Rating Scales

<table>
<thead>
<tr>
<th>Characteristic of Interest</th>
<th>Rating Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchase Intent</strong></td>
<td></td>
</tr>
<tr>
<td>Definitely will buy</td>
<td>Probably will buy</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>Somewhat agree</td>
</tr>
<tr>
<td>Very good</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Dependability</strong></td>
<td></td>
</tr>
<tr>
<td>Completely dependable</td>
<td>Somewhat dependable</td>
</tr>
<tr>
<td>Very stylish</td>
<td>Somewhat stylish</td>
</tr>
<tr>
<td><strong>Style</strong></td>
<td></td>
</tr>
<tr>
<td>Completely satisfied</td>
<td>Somewhat satisfied</td>
</tr>
<tr>
<td>Very expensive</td>
<td>Expensive</td>
</tr>
<tr>
<td><strong>Satisfaction</strong></td>
<td></td>
</tr>
<tr>
<td>Very easy to use</td>
<td>Somewhat easy to use</td>
</tr>
<tr>
<td>Extremely bright</td>
<td>Very bright</td>
</tr>
<tr>
<td>Very modern</td>
<td>Somewhat modern</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
One Stage vs. Two Stage

Traditional One-Stage Format
“How effective do you believe Senator Foghorn is in having your money stay in the community?”

<table>
<thead>
<tr>
<th>Very effective</th>
<th>Somewhat effective</th>
<th>Somewhat ineffective</th>
<th>Very ineffective</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Two-Stage Format
“How effective do you believe Senator Foghorn is in having your money stay in the community?”

**How effective?**
- [ ] Effective
- [ ] Ineffective
- [ ] No opinion

**Would that be very or somewhat?**
- [ ] Very
- [ ] Somewhat

Advice for analyzing rating scales is given in the Practicing Marketing Research box below.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Rank Order Scale

Uses Comparative Scaling:

Put these fast food chains in order of preference:

• McDonalds
• Burger King
• Taco Bell
**Rank Order Scale**

### Exhibit 11.4(A)

**Series of Rank-Order Scales Used to Evaluate Eye Shadows and Car Resale Values**

**Eye Shadow Scales**

Please rank the following eye shadows, with 1 being the brand that best meets the characteristic being evaluated and 6 the worst brand on the characteristic being evaluated. The six brands are listed on card C. (HAND RESPONSIENT CARD C.) Let's begin with the idea of having high-quality compacts or containers. Which brand would rank as having the highest quality compacts or containers? Which is second? (RECORD BELOW.)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avon</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>Cover Girl</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>Estee Lauder</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>L'Oreal</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>Natural Wonder</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>Revlon</td>
<td>_________</td>
<td>_________</td>
<td>_________</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Q-Sorting

• Q-sorting is basically a sophisticated form of rank ordering.
• A respondent is given cards listing a set of objects—such as verbal statements, slogans, product features, or potential customer services—and asked to sort them into piles according to specified rating categories.
• Q-sorts usually contain a large number of cards—from 60 to 120 cards.
• For statistical convenience, the respondent is instructed to put varying numbers of cards in several piles, the whole making up a normal statistical distribution.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Here is a Q-sort distribution of 90 items:

<table>
<thead>
<tr>
<th>Excellent Feature</th>
<th>Poor Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

This is a rank-order continuum from Excellent Feature (10) to Poor Feature (0), with varying degrees of approval and disapproval between the extremes.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Paired Comparison

“Which drink do you prefer:”

___Coke
___Pepsi

___Coke
___Sprite

___Pepsi
___Sprite

Exhibit 11.5
Paired Comparison Scale for Sun Care Products

Here are some characteristics used to describe sun care products in general. Please tell me which characteristic in each pair is more important to you when selecting a sun care product.

a. Tans evenly
a. Prevents burning
a. Good value for the money
a. Not greasy
a. Tans without burning
a. Protects against burning and tanning
a. Goes on evenly
a. Prevents burning

b. Tans without burning
b. Protects against burning and tanning
b. Goes on evenly
b. Does not stain clothing
b. Prevents burning
b. Good value for the money
b. Tans evenly
b. Not greasy

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Paired Comparison

### Exhibit 11.5

**Paired Comparison Scale for Sun Care Products**

Here are some characteristics used to describe sun care products in general. Please tell me which characteristic in each pair is more important to you when selecting a sun care product.

<table>
<thead>
<tr>
<th>Pair</th>
<th>a.</th>
<th>b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tans evenly</td>
<td>Tans without burning</td>
</tr>
<tr>
<td>2.</td>
<td>Prevents burning</td>
<td>Protects against burning and tanning</td>
</tr>
<tr>
<td>3.</td>
<td>Good value for the money</td>
<td>Goes on evenly</td>
</tr>
<tr>
<td>4.</td>
<td>Not greasy</td>
<td>Does not stain clothing</td>
</tr>
<tr>
<td>5.</td>
<td>Tans without burning</td>
<td>Prevents burning</td>
</tr>
<tr>
<td>6.</td>
<td>Protects against burning and tanning</td>
<td>Good value for the money</td>
</tr>
<tr>
<td></td>
<td>Goes on evenly</td>
<td>Tans evenly</td>
</tr>
<tr>
<td></td>
<td>Prevents burning</td>
<td>Not greasy</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Constant Sum Scale

What features do you want in a car?

Sun roof ______
Leather ______
ABS Breaks ______
CD Player ______

Total 100 points
Constant Sum Scale

Exhibit 11.6

Constant Sum Scale Used in Tennis Sportswear Study

Below are seven characteristics of women’s tennis sportswear. Please allocate 100 points among the characteristics such that the allocation represents the importance of each characteristic to you. The more points that you assign to a characteristic, the more important it is. If the characteristic is totally unimportant, you should not allocate any points to it. When you’ve finished, please double-check to make sure that your total adds to 100.

Characteristics of Tennis Sportswear

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number of Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is comfortable to wear</td>
<td></td>
</tr>
<tr>
<td>Is durable</td>
<td></td>
</tr>
<tr>
<td>Is made by well-known brand or sports manufacturers</td>
<td></td>
</tr>
<tr>
<td>Is made in the United States</td>
<td></td>
</tr>
<tr>
<td>Has up-to-date styling</td>
<td></td>
</tr>
<tr>
<td>Gives freedom of movement</td>
<td></td>
</tr>
<tr>
<td>Is a good value for the money</td>
<td></td>
</tr>
</tbody>
</table>

100 points

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Semantic Differential Scale

<table>
<thead>
<tr>
<th>Adjective 1</th>
<th>Mean of Each Adjective Pair</th>
<th>Adjective 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modern</td>
<td>1</td>
<td>Old-fashioned</td>
</tr>
<tr>
<td>Aggressive</td>
<td>2</td>
<td>Defensive</td>
</tr>
<tr>
<td>Friendly</td>
<td>3</td>
<td>Unfriendly</td>
</tr>
<tr>
<td>Well-established</td>
<td>4</td>
<td>Not well-established</td>
</tr>
<tr>
<td>Attractive exterior</td>
<td>5</td>
<td>Unattractive exterior</td>
</tr>
<tr>
<td>Reliable</td>
<td>6</td>
<td>Unreliable</td>
</tr>
<tr>
<td>Appeals to small companies</td>
<td>7</td>
<td>Appeals to big companies</td>
</tr>
<tr>
<td>Makes you feel at home</td>
<td></td>
<td>Makes you feel uneasy</td>
</tr>
<tr>
<td>Helpful services</td>
<td></td>
<td>Indifferent to customers</td>
</tr>
<tr>
<td>Nice to deal with</td>
<td></td>
<td>Hard to deal with</td>
</tr>
<tr>
<td>No parking or transportation problems</td>
<td></td>
<td>Parking or transportation problems</td>
</tr>
<tr>
<td>My kind of people</td>
<td></td>
<td>Not my kind of people</td>
</tr>
<tr>
<td>Successful</td>
<td></td>
<td>Unsuccessful</td>
</tr>
<tr>
<td>Ads attract a lot of attention</td>
<td></td>
<td>Haven't noticed ads</td>
</tr>
<tr>
<td>Interesting ads</td>
<td></td>
<td>Uninteresting ads</td>
</tr>
<tr>
<td>Influential ads</td>
<td></td>
<td>Not Influential</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
### Staple Scale

Exhibit 11.8

**Stapel Scale Used to Measure a Retailer’s Web Site**

<table>
<thead>
<tr>
<th>Cheap Prices</th>
<th>Easy to Navigate</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>+5</td>
</tr>
<tr>
<td>-4</td>
<td>+4</td>
</tr>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>-4</td>
<td>-4</td>
</tr>
<tr>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>-2</td>
<td>-2</td>
</tr>
<tr>
<td>-1</td>
<td>-1</td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
### Exhibit 11.9

**Likert Scales Used by an Internet Game Site**

**Scale A**

How did you feel about the registration process when you became a new user?

<table>
<thead>
<tr>
<th>The registration was simple.</th>
<th>Somewhat disagree</th>
<th>Somewhat disagree</th>
<th>Neutral</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The registration questions were “nonthreatening.”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registration here will protect my privacy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The registration did not take a long time to complete.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The registration informed me about the site.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
# Purchase Intent Scales

### Exhibit 11.10

**Purchase Intent Scale and Related Questions for In-Home Product Placement of Fly Traps**

21. If a set of three traps sold for approximately $3.00 and was available in the stores where you normally shop, would you:

- **(51)**
  - definitely buy the set of traps
  - probably buy
  - probably not buy
  - definitely not buy

22. Would you use the traps (a) instead of or (b) in addition to existing products?

- **(52)**
  - Instead of
  - In addition to

23. Would you recommend this product to your friends?

- **(53)**
  - definitely
  - probably
  - probably not
  - definitely not

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Multiple Choice Scale

- Multiple response
- Single response
- Controlled response

Check all that apply
Check only one
Check the top three

Net Promoter Score (NPS):

Begin with a 10-point scale on likelihood to recommend. Next, the difference between promoters and dissuaders is computed.
How to Select a Scale
Things to Consider

1. The Nature of the Construct Being Measured
2. Type of Scale and Number of Scale Categories
3. Balanced vs. Nonbalanced
   - Balanced:
     • Scales with equal numbers of positive & negative categories.
   - Nonbalanced:
     • Scales weighted towards one end or the other of the scale.
4. Forced vs. Nonforced
   - Having an odd vs. even number of response choices.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Attitude Measures and Management Decision Making

• Determinant Attitudes
  – A key component to intentions
  – Those customer attitudes most closely related to preferences or to actual purchase decisions.

Source: McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
Types of Questioning

• Direct vs. Indirect
  – Observation
Summary

• A paradigm for developing better measures of marketing constructs
• Current practice in scale development
• The linkage among attitudes, behavior, and marketing effectiveness
• Measurement Scales
References

• McDaniel & Gates (2009), Marketing Research, 8th Edition, Wiley
• Churchill, G. A., Jr., (1979), A paradigm for developing better measures of marketing constructs. Journal of Marketing Research, 16(Feburary), 64-73.
• 賴榮裕(2006)，衡量員工電子化企業預備度之研究，臺灣大學資訊管理學研究所未出版博士論文