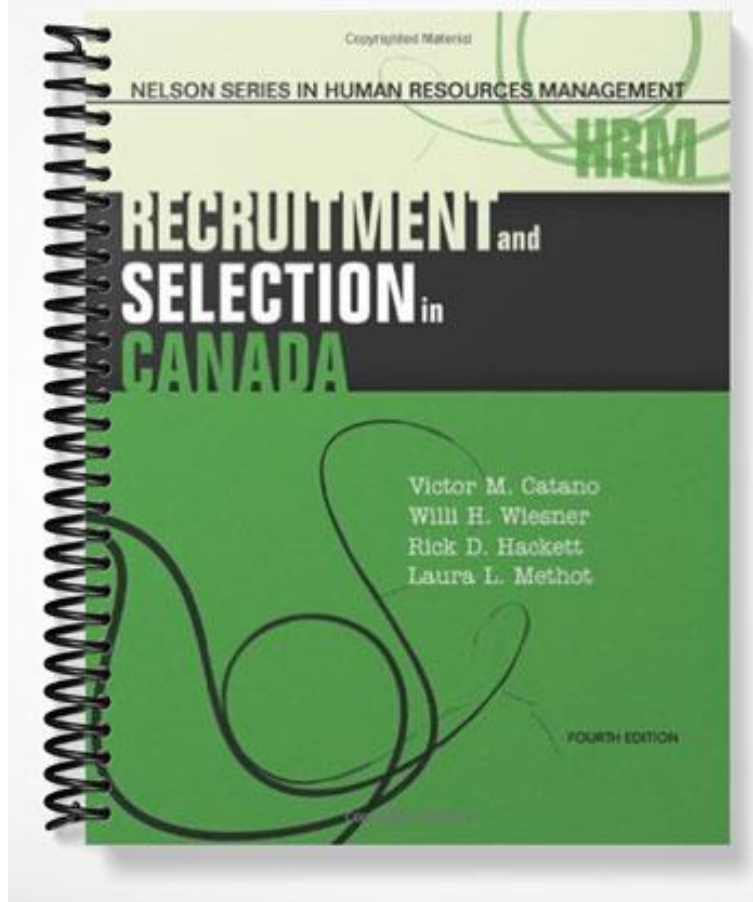


SOLUTIONS MANUAL



Chapter 2

Foundations of Recruitment and Selection I: Measurement, Reliability, and Validity

Chapter Objectives

After reading this chapter, you will be able to do the following:

1. Understand the basic components that make up a traditional personnel selection model;
2. Know what a correlation coefficient is, along with a few other basic statistical concepts used in personnel selection;
3. Have a good understanding of the concepts of reliability and validity;
4. Recognize the importance and necessity of establishing the reliability and validity of measurements used in personnel selection;
5. Identify common strategies that are used to provide evidence on the reliability and validity of measurements used in personnel selection; and
6. Appreciate the requirements for measurements used in personnel selection to evaluate applicants fairly and in an unbiased fashion.

Chapter Summary

This chapter develops the idea that personnel recruitment and selection strategies based on information obtained through scientific methods are more likely to benefit an organization than decisions based on impressions or intuition. The chapter starts with an introduction to scientific methodology and goes on to examine basic measurement concepts that underlie contemporary recruitment and selection practices. This chapter is an effective review for those who have had previous courses on research methods and psychological measurement. For others, it is an overview of research terms and methods.

Lecture Outline

Comments	Learning Activity
<p>A. <i>The Meiorin Case:</i></p> <ul style="list-style-type: none"> ➤ The Supreme Court of Canada decision in the Meiorin case set new legal standards for the use of tests in personnel selection. ➤ In this case, the BC government undertook a job analysis of the position of firefighter to determine the essential components of firefighting and then to create a series of tests to measure those components among firefighters. ➤ Go through Figure 2.1., pg 24 – the researchers followed all of the steps except the most crucial one of showing “that prescribed aerobic capacity was necessary for either men or women to perform the work of a forest firefighter satisfactorily. ➤ In the court’s opinion, the research failed to establish the linkage specified by Line B in Figure 2.1. and failed to take into account physiological differences between men and women. 	<p><i>Case Study: “The Meiorin Case”</i> Ask students to review this case and have them identify the issues in the case that relate to personnel selection. Discuss in small groups of 4 and then in the larger class.</p>
<p>B. <i>The Recruitment & Selection Process</i></p> <p>The employer’s goal is to hire an applicant who possesses the knowledge, skills and abilities or other attributes (KSAO’s) required to successfully perform the job being filled.</p> <p>The employer makes a guess about which applicant will perform the job most effectively.</p>	

<p><i>C. The Hiring Process</i></p> <p>Figure 2.1. on pg 24 presents an overview of the components and process of a traditional selection system. The components of this model are discussed in detail in later chapters.</p> <p><i>Review the difference between Science-based selection and Practice-based selection in Table 2.1., pg 29.</i></p>	<p><i>Figure 2.1 – Job Analysis, Selection and Criterion Measures of Performance: A Systems Approach</i> – ask students to review this diagram to review the steps involved in hiring a police constable. What are some the major elements of the process? What questions do students have? Also ask students to review each of the steps in the process for the Winnipeg Police in <i>Recruitment and Selection Today 2.1</i></p> <p><i>Industry Practices</i> – students could be assigned in pairs to HR professionals who are actively involved in recruitment. The students could meet with practitioners to review all of the steps in the hiring process for a particular organization.</p>
<p><i>D. Correlation and Regression</i></p> <p>Basic Statistics: if a HR manager interviewed only a few job applicants, it is possible to directly compare the applicants on the basis of their assigned scores. However, what if there is a very large number of applicants? – statistical procedures would allow important information to be contained in the set of applicant scores.</p> <p>Correlation: in many areas of personnel selection, the relationship between two variables is of considerable interest.</p> <p>Typical Statistical Correlation Measures Used in Recruitment Include:</p> <p>The mean score represents the most typical or “average” score that might be expected within a group of scores; it is the one score that best represents the set of scores. Not every job applicant has a score that is similar to the mean score.</p> <p>The variance is derived from the more the observed scores differ from each other and</p>	<p>Ask students to define key terms identified in the text such as regression, correlation, reliability and validity.</p> <p><i>Table 2.2 – Measuring a Relationship Between Cognitive Ability and Job Performance</i></p> <p>After explaining correlation coefficient, have students review this table in order to understand its application in the selection process.</p> <p><i>Figure 2.2 – Scatterplot of Cognitive Ability and Job Performance</i></p> <p>Students can review this figure in order to view the application between the <i>size</i> and <i>direction</i> between two variables.</p>

from the mean – this is **high variance**; the more clustered the scores around a mean score indicates **smaller variance**.

Standard deviation is the square root of the variance; it is more convenient to use since it presents information in terms of the actual measurement scale. Knowing both the mean and the variance allows the manager to know the score that the average applicant should attain, and how much variability to expect in the applicant scores.

Correlation coefficient is a statistic that presents information on the extent of the relationship between two variables. The authors provide an example using the variables of cognitive ability and job performance. To establish this correlation, the manager must have two scores for each applicant, one for cognitive ability and the other for job performance. In the case of job applicants, the manager could establish a know-how score based on the interview or through some other test that was administered to each applicant.

Coefficient of Determination – this value represents the proportion of variability in one variable that is associated with the variability in another.

Simple Regression – the relationship between two variables expressed in a straight line – the correlation coefficient expresses the degree and direction of a linear relationship between two variables. This linear relationship is expressed in a straight line.

Multiple Regression – many practical situations involve more than two variables. Other sources of information for the selection decision are letters of reference and application forms. The set of predictors can be combined into one

<p>equation to indicate the extent to which the set, taken as a whole, is related to the criterion variable.</p>	
<p><i>E. Reliability</i></p> <p>Reliability is the degree to which observed scores are free from random measurement errors. Reliability is an indication of the stability or dependability of a set of measurements over repeated applications of the measurement procedure. Reliability refers to the consistency of a set of measurements when a testing procedure is repeated on a population of individuals or groups. In terms of testing, it is expected that a test will give approximately the same information each time it is given to that person.</p> <p>A true score is the average score that an individual would earn on an infinite number of administrations of the same test or parallel versions of the same test.</p> <p>An error score (or measurement error) is the hypothetical difference between an observed and a true score.</p> <p>Measurement error – can be thought of as the hypothetical difference between an individual’s observed score on any particular measurement and the individual’s true score. Measurement error, whether systematic or random, reduces the usefulness of any set of measures or the results from any test. It reduces the confidence that we can place in the score the measure assigns to any particular individual. <i>Does the score accurately represent the individual’s knowledge or ability or is it so fraught with error that we cannot use it to make meaningful decisions?</i></p>	

<p>Factors Affecting Reliability –</p> <p>Temporary individual characteristics – if a job candidate is quite ill or anxious, the know-how score may be affected and have a greater error component.</p> <p>Lack of Standardization – changing the conditions under which measurements are made introduces error in the measurement process. For example, reliability is decreased if different candidates are asked different questions during interviews. If the environment where candidates for the same job differs from interview, this will also affect reliability.</p> <p>Chance – factors unique to a specific procedure introduce error into the set of measurements. If an employer has interviewed someone previously, he will be have a better chance of performing well in an interview with that employer again.</p> <p>Methods of Estimating Reliability:</p> <p>To measure reliability, we have to estimate the degree of variability in a set of scores that is caused by measurement error.</p> <p>Test and Retest – the identical measurement procedure is used to assess the same characteristic over the same group of people on different occasions.</p> <p>Alternate Forms – when using second rounds of interviews, HR managers should use a different set of questions than the first interview round.</p> <p>Internal Consistency – rather than select any particular pair of items, the correlations between the scores in all possible pairs of items are calculated and then averaged.</p>	
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<p>Inter-rater Reliability – when scores from different independent raters are similar.</p> <p>Choosing an Index of Reliability – it remains within the professional judgment of the human resources specialist to choose an appropriate index of reliability and to determine the level of reliability that is acceptable for use of specific measure.</p>	
<p>F. Validity</p> <p><i>It is important and necessary to demonstrate that a measurement is reliable; it is also necessary to show that the measurement captures the essence of the characteristic or attribute.</i></p> <p>Validity is the degree to which accumulated evidence and theory support specific interpretations of test scores in the context of the test’s proposed use.</p> <p>Validation Strategies:</p> <p>Evidence based on test content – this type of validity evidence comes from analyzing the relationship between a test’s content and the construct the test is intended to measure. Evidence of validity based on test content can consist of either empirical or logical analyses of how well the contents of the test, and interpretation of the test scores, represent the construct.</p> <p>Evidence based on relations to other variables – this type of evidence is based on an analysis of the relationship between test scores and other variables that are external to the test.</p> <p>Predictive evidence for test-criterion relationships – <i>predictive and concurrent</i> strategies are popular methods used to provide evidence for test-criterion relationships. Predictive evidence is obtained through research designs that</p>	<p><i>Go through Figure. 2.3, pg 43</i></p>

<p>establish the correlation between predictor scores (know how scores) obtained before an applicant is hired and criteria (performance scores) obtained at a later time, usually after an applicant is employed.</p> <p>Concurrent evidence for test –criterion relationships – this type of evidence is obtained through research designs that establish a correlation between predictor and criteria scores from information that is collected at approximately the same time from a specific group of workers.</p> <p>Validity generalization is the application of validity evidence, obtained through a meta-analysis of data obtained from many situations, to other situations that are similar to those on which the meta-analysis is based.</p> <p>Factors Affecting Validity Coefficients:</p> <p>Range restriction – when measurements are made on a subgroup that is more homogeneous than the larger group from which it is selected, validity coefficients obtained on the subgroup are likely to be smaller than those obtained from the larger group. This reduction in the size of the validity coefficient due to the selection process is called range restriction.</p> <p>Measurement error – the reliability of a measure places an upper limit on validity.</p> <p>Sampling error – estimates of the validity within a population may vary considerably between samples; estimates from small samples are likely to be variable.</p>	<p><i>See Recruitment and Selection Today 2.1., pg 47</i></p>
<p>G. Bias and Fairness <i>In discussing reliability, we noted that measurement errors could be made in a consistent or predictable fashion.</i></p>	<p>Discussion Question – in pairs, discuss a time when you experienced bias. Think of the first week of class and your first impressions of your teachers and/or peers.</p>

<p>Bias refers to systematic errors in measurement, or inferences made from those measurements, that are related to different identifiable group membership characteristics such as age, sex, or race.</p> <p>Differential prediction occurs when the predicted, average performance score of a subgroup (e.g. males or females), is systematically higher or lower than the average score predicted for the group as a whole. This situation results in a larger proportion of the lower-scoring group being rejected on the basis of their test scores, even though they would have performed successfully had they been hired.</p> <p>Fairness in measurement refers to the value judgments people make about the decisions or outcomes that are based on those measurements. Fairness is the principle that every test taker should be assessed in an equitable manner. Issues of fairness cannot be determined statistically or empirically. Fairness involves perceptions.</p> <p><i>H. Summary</i></p> <p>Science produces information that is based on accepting as true only objective information that can withstand continued attempts to cast doubt on its accuracy.</p> <p>As demonstrated by the Meiorin decision, courts and tribunals will review the methods used to develop selection procedures. The procedures used to select employees must meet acceptable professional standards.</p> <p>The best way of ensuring this is to be familiar with measurement, reliability and validity issues.</p>	<p>What biases were operating at that time?</p> <p><i>Review Figure 2.4 – Cognitive Ability and Job Performance, pg 51 – to understand differential prediction.</i></p> <p><i>Group Discussion</i> – what is your perception of fairness? Does an organization have an obligation to make an enterprise as profitable as possible on behalf of its owners, or should it meet the objectives of society by providing equal employment opportunities for members of different population groups?</p> <p><i>See Recruitment and Selection Today 2.2 – Different Views of Fairness for the five definitions provided by The Standards for Educational and Psychological Testing.</i></p>
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End of Chapter Exercises

(Students answers will vary.)

1. Review the *Required Professional Capabilities* (RPC's) related to this chapter. Prepare relevant questions about these to discuss in class.

Short Answer Questions

1. *We presented a summary of the Meiorin case at the outset of this chapter. Can you think of procedures or changes that the consultants could have effected that would have allowed the test to meet the objections of the Supreme Court?*

As demonstrated by the Meiorin decisions, courts and tribunals will review the methods used to develop selection procedures. The procedures used to select employees must meet acceptable professional standards. The best way of ensuring this is to be familiar with measurement, reliability and validity issues, and to use only those procedures that will withstand legal scrutiny; that is the selection procedures used validly predict work performance in a nondiscriminatory manner. The reliability and validity of the information used as part of personnel selection procedures must be established empirically. Scientific procedures allow for the measurement of important human characteristics that may be related to job performance and are more likely than other procedures to produce results that meet legal requirements.

2. *Discuss the reasons why it is better to base a selection system on science than on a gut feeling?*

Science produces information that is based on accepting as true only objective information that can withstand continued attempts to cast doubt on its accuracy. The accuracy of scientific statements is examined empirically through methods that can be observed, critiqued, and used by others. Scientific information is dynamic and constantly evolving.

3. *Can an invalid selection test be reliable? Can an unreliable selection test be valid?*

In terms of testing, we expect a test to provide approximately the same information each time it is given to that person. Errors may be made in a consistent or predictable fashion. Systematic errors do not affect the accuracy of the measurements but rather the meaning or interpretation of a selection test's measurements. These errors can lead to wrong conclusions about results derived from the selection process itself. Factors affecting reliability of results include temporary individual characteristics, a lack of standardization and chance.

4. *Does an organization have an obligation to make the enterprise as profitable as possible on behalf of its owners, or does it have an obligation to meet the objectives of society by providing equal employment opportunities for members from different population groups?*

There are no easy answers to this question. In cases such as this, one resolution is to compare the fairness of the test in question with the fairness of an alternative that might be used in place of the test. Recruitment and Selection Today (2.2) presents some differing views on fairness.