CHAPTER 3

CRITERION OF SUCCESS

3.1 Introduction

Before the efficiency of a test or any form of measurement can be determined, the present workers, on whom the tentative tests were performed, must be classified as successful and unsuccessful workers.

This division occurs according to the standard known in Business Psychology as a "criteria of work success" which must, if not available, be prepared.

Plug et al (1997:196) defines a criterion as a variable, which provides an acceptable indication of what a psychological test should measure, and it can be used to investigate the empirical validity of a test.

"Adequate and accurate criterion measurement is a fundamental problem in personnel psychology. Although criteria are sometimes used for predictive purposes and sometimes for evaluative purposes, in both cases they represent that which is important or desirable. Criteria are operational statements of goals or desired outcomes" according to Cascio (1991:50).

Every time an evaluation takes place criteria are used, thus standards to measure against, are set. When students decide whether a lecturer is a 'good lecturer' student A may be of opinion that a 'good lecturer' prepares well and provide clear instructions, while student B feels that a 'good lecturer' is someone who is enthusiastic, inspires students and possesses excellent communication skills. These two students use different criteria to define a 'good lecturer'. (Muchinsky et al, 1998:46)

Criteria comprise a wide range of evaluations and are:

"..... the evaluative standards by which objects, individuals, procedures or collectivities are assessed for the purpose of ascertaining their quality", according to Muchinsky (1993:61).

On the other hand McCormick and Ilgen (1992:53) define criteria as behavioural measurements to be used for administrative as well as research purposes.

3.2 Conceptual versus actual criteria

A good starting point is a conceptual criterion, which is a theoretical construct of an abstract idea that can never be measured. Muchinsky (1993:61) defines conceptual criteria as *"... an ideal set of factors that constitute a successful person (object or collectivity) as conceived in the psychologist's mind"*.

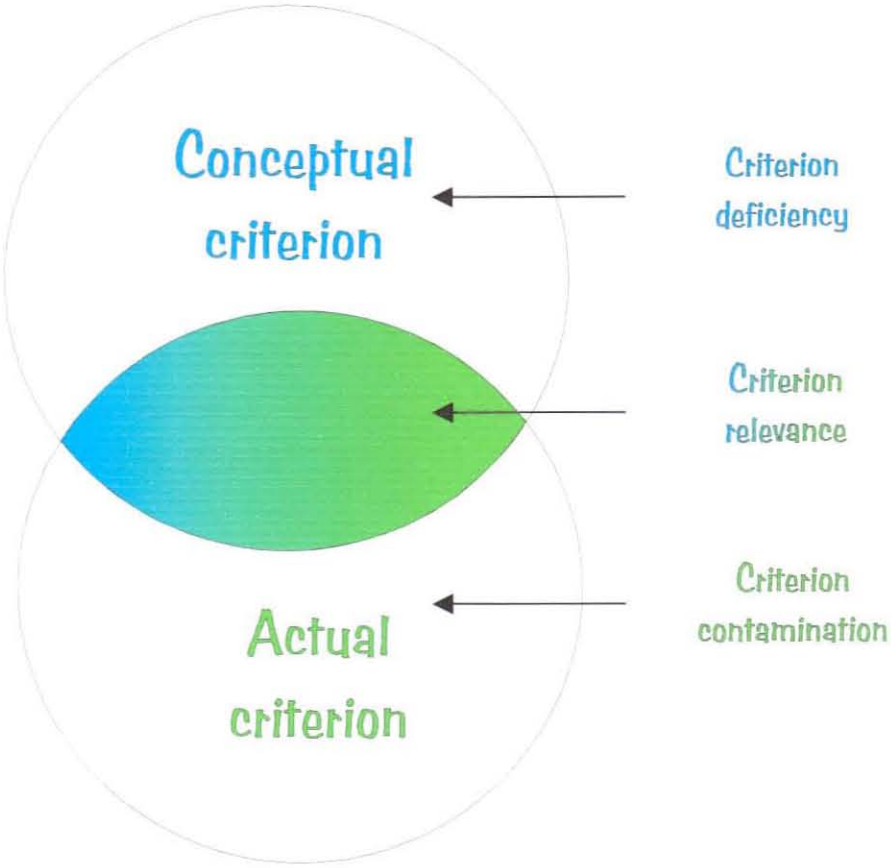
Conceptual criteria must be transformed into actual criteria, which can be measured. The variables that will serve as criteria must be established.

According to Muchinsky et al (1998:48) three concepts present the relationship between actual and conceptual criteria:

- deficiency;
- relevance; and
- contamination.

Figure 3.1 illustrates the relationship between conceptual and actual criteria.

FIGURE 3.1: CRITERION DEFICIENCY, RELEVANCE, AND CONTAMINATION.



(Source: Muchinsky et al, 1998:48)

How much the circles overlap cannot be determined because the conceptual criterion is a theoretical abstraction. There will always be a certain unspecified amount of deficiency, relevance, and contamination because the actual criteria selected are never totally equivalent to the conceptual criteria.

The degree to which the actual criteria fail to overlap with the conceptual criteria is known as criterion deficiency. Criterion deficiency can be reduced through careful selection of the actual criteria, but never eliminated Cascio (1991:53).

Criterion relevance is the degree to which the conceptual criteria and actual criteria coincide. The criterion relevance will be greater if the match between the conceptual criteria and the actual criteria is closer.

That part of the actual criteria that is unrelated to the conceptual criteria is the criteria contamination, therefore this measures something other than the conceptual criteria. Contamination can be divided into:

- bias, the degree the actual criteria consistently measure something other than the conceptual criteria, and
- error, the degree to which the actual criteria are not related to anything at all. (Muchinsky et al, 1998:49).

3.3 Distal versus proximal criteria

Distal criteria refer to the standard used to make long-term decisions about quality while proximal criteria refer to the standard used to make short term decisions about quality according to Muchinsky et al (1998:50).

3.4 Composite versus multiple criteria

Cascio (1998:53) argues that job performance is multidimensional in nature therefore to measure it adequately multidimensional criteria are needed.

Composite criterion:

"..... should provide a yardstick or overall measure of "success" or "value to the organization" of each individual" according to Cascio (1998:53). Although the criterion dimensions are separately treated in validation such a single index is necessary when making decisions and comparing individuals.

Researchers as mentioned in Cascio (1998:53) who prefer multiple criteria argue that:

"..... measures of demonstrably different variables should not be combined."

Combining dimensions, or various criterion elements into a single index does not imply that a single underlying dimensions of job performance exists. Each criterion reflects a separate dimension of job behaviour according to McCormick & Ilgen (1992:64).

3.5 Errors and criterion of success

Errors are a fact of life and statements like: "To err is human, to forgive divine" reflect this.

The results of human error can be minimal in certain cases while in others these can reach alarming proportions in terms of human safety, efficiency of operations, physical damage and economic losses.

Human error can occur in different forms but it is generally defined in terms of poor quality of work. In certain tasks it is simple to determine it through observation. The quality of many tasks varies on a continuum from poor to good. In these cases a cut-off point between poor and good job execution must be fixed.

Peter (1962) as mentioned by McCormick and Ilgen (1980:47) defines human error as:

" Any deviation from a previously established, required or expected standard of human performance that results in an unwanted or undesirable time delay, difficulty, problem, incident, malfunction or failure".

The interest in the systematic analysis of errors as a criterion evolved mainly as a result of engineers involved in the design of equipment and systems to be used by people, thus in the field of ergonomics. The focus was to design equipment without defects.

The fact that work-related variables are generally caused by the individual or the situation it is logical (theoretical) that error will feature in either one or both of these determinants. Meistner (1967) as mentioned in McCormick and Ilgen (1980:48) classifies it as follows:

- work space
- design and lay-out of working environment
- hand equipment
- handling methods
- transport
- storing
- inspection of equipment
- information regarding the planning of work
- operating instructions

These aspects can be categorised as follows:

- work characteristics
- system organisation
- test characteristics
- physical environment

The individual variables that are associated with high rates of error cover the entire spectrum of human behaviour.

Ware (1964) as mentioned in McCormick and Ilgen (1980:48) argues for greater recognition of the difference between situational and individual variables as sources of error as both these sources mediate human performance and act as intervening variables although they do not control performance. The difference between these two variables is the degree of directness with which they influence human performance.

The situational variables set the parameters for the individual variables. These variables influence the probability of successful performance. Individual variables are the foundation for predisposing individuals toward certain behaviours, that in turn increase the odds of error-free performance or the reverse.

The primary interest in human error is in those areas where the human element is present. In these areas the general human intention with reference to error producing behaviour does not necessarily lead to a large number of errors, but the effect creates the possibility of an increase in errors.

3.6 Standards for criteria

Blum and Naylor's (1968:182) listing is the most representative of what criteria should be:

- reliable
- realistic
- representative
- related to other criteria
- acceptable to the job analyst
- acceptable to management
- consistently applied in any situation
- predictable
- inexpensive
- able to understand
- measurable
- relevant
- uncontaminated and bias-free
- sensitive

Three main criteria questions should be asked:

- When should criteria be obtained?
- How are criteria selected? and
- What level of performance is acceptable?

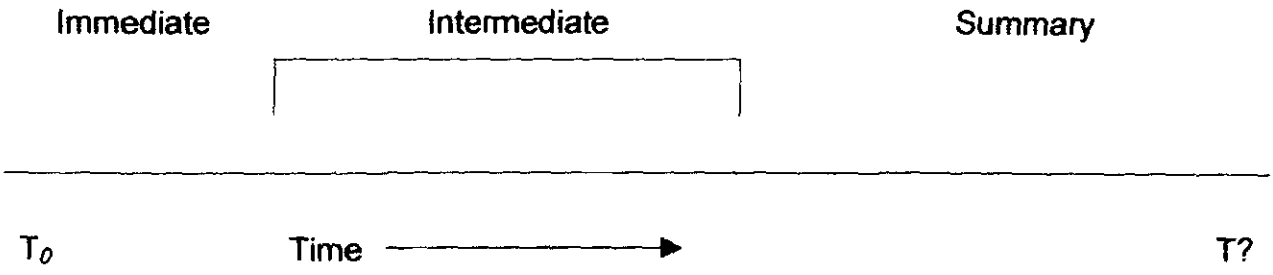
3.7 Criteria dimensions

Several dimensions of conceptual criteria may exist. The interpersonal skills of a nurse could be included in a psychological dimension, rand costs of errors, an economic dimension, and a person's relationship with the environment or an ecological dimension as stated by Cascio (1998:43) as well as McCormick and Ilgen (1980:59).

3.7.1 Temporal dimensions

Temporal dimension refers to the time when a criterion measurement is taken. The best time varies depending on the situation as reflected by Cascio (1998:43) in figure 3.2.

FIGURE 3.2: THE TEMPORAL DIMENSION OF CRITERION MEASUREMENT.



(Source: Cascio, 1998:44)

Immediate criteria are near-term measures such as final examination marks of a student. Intermediate criteria are usually obtained after some time has elapsed. This could be a performance rating after 6 months. However, summary criteria are longer-term averages or totals which counteract the short-term effects and errors of observation and measurement. The

average of a student's two-weekly tests and assignments could used here. (Cascio, 1998:44).

Ghiselli (1956) as mentioned by Cascio (1989:44) identified three different types of criterion dimensionality:

- Static dimensions

A static dimension is a 'snapshot' of performance at a single time using a single criterion, which necessarily reflects overall employee performance.

- Dynamic dimensions

A dynamic dimension refers to criteria being adapted over a period of time as an employee develops and learns.

- Individual dimensions

Although two people are performing the same job, the value they add to the organisation may differ. Cascio (1998:45) quotes Kingsbury (1933) to illustrate:

"Some executives are successful because they are good planners, although not successful directors. Others are splendid at co-ordinating and directing, but their plans and programs are defective. Few executives are equally competent in both directions. Failure to recognize and provide, in both testing and rating, for this obvious distinction is, I believe, one major reason for the unsatisfactory results of most attempts to study, rate and test executives. Good tests of some kind of executive ability are not good tests of the other kind".

3.8 Types of criteria

A variety of measures are used in the different fields of psychology to determine types of criteria. McCormick and Ilgen (1980:47) and Muchinsky (1993:80) classify job-related behaviours as follows:

3.8.1 Objective criteria

Objective criteria or 'hard' criteria refer to records or statistics that do not involve any type of subjective evaluation. These include:

- Production
- Job level and promotions
- Sales
- Tenure and turnover
- Absenteeism
- Accidents and
- Theft

3.8.2 Subjective criteria

Criteria such as the evaluation or judgement of performance of a subordinate by her supervisor are defined as subjective criteria. Human judgment leans towards various kinds of biases according to Cascio (1991:75).

3.8.3 Performance criteria

Berry and Houston (1993:177) as well as McCormick and Ilgen (1980:46) define criterion as situational, in other words the condition, context and objective will determine the definition of a criterion. For example:

- in the work situation it can be work-related behaviour;
- in research it will be those variables which can predict another set of variables; and
- in administrative functions it will be the need exist to measure work related behaviour.

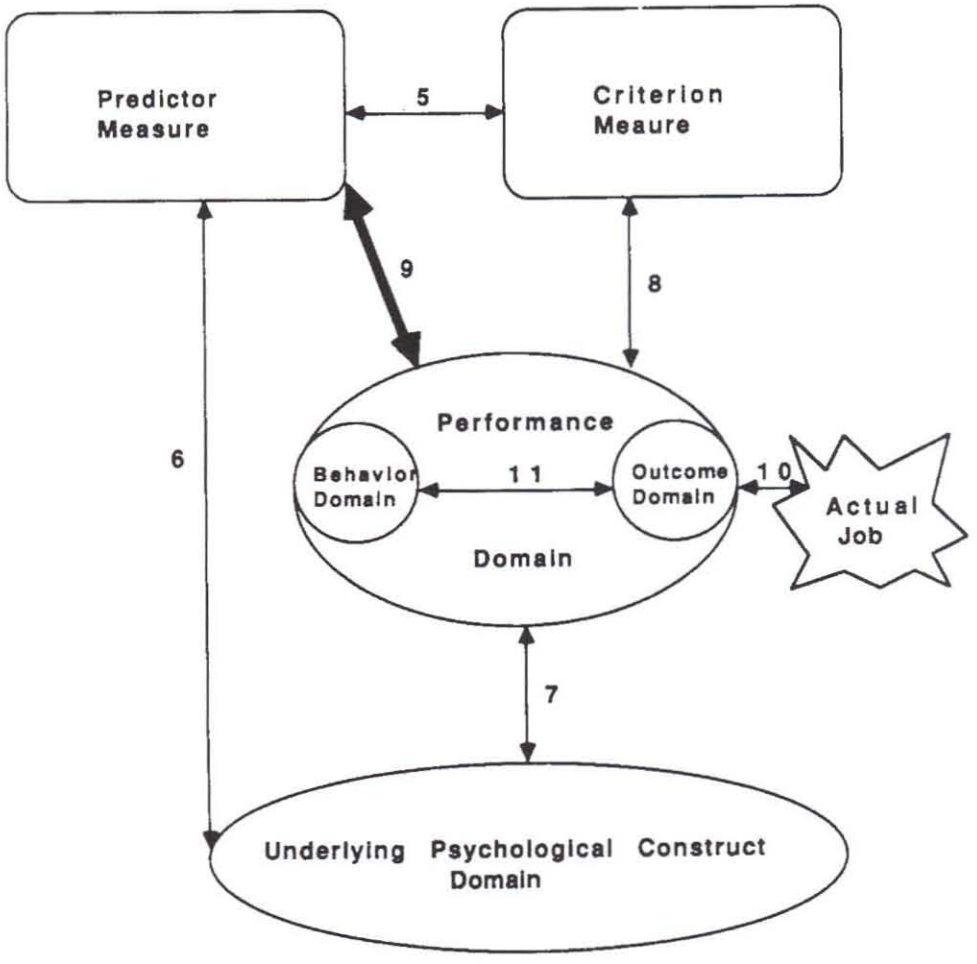
The measurement of specific work-related behaviour is very often dualistic and can serve as a criterion for both administrative and research purposes.

3.8.4 Research design and criterion theory

"Traditionally, personnel psychologists were guided by a simple prediction model that sought to relate performance of one or more predictors with a composite criterion" according to Cascio (1991:70).

A more complete criterion model is provided by Cascio (1991:70) as presented by Binning and Barrett (1989) in Figure 3.3.

FIGURE 3.3: A MODIFIED FRAMEWORK THAT IDENTIFIES THE INFERENCES FOR CRITERION DEVELOPMENT.



(Source: Cascio, 1991:70)

Inferences one (1) to four (4) indicate critical linkages in the theory-building process. Inference nine (9) would be direct empirical evidence that assessment scores relate to valid measurements of job performance. Inference five (5) is the one which raises most concern among researchers. The term criterion-related was developed to denote this type of evidence. To have utter confidence in inference nine (9) both inference five (5) and eight (8) must be justified. Inference eight (8) represents the process of criterion development. Job analysis provides the basis for inferences seven (7), ten (10) and eleven (11). Construct validity is represented by inferences six (6) and seven (7). When grasping and validating criteria inferences seven (7), eight (8), ten (10) and eleven (11) are critical.

Figure 3.3 enables the identification of probable locations for a criterion problem.

Hardly any attention is given to intervening variables. Managers involved in personnel decisions are most concerned about the extent to which assessment information will allow accurate predictions about job performance.

Selection decisions involve judgement - not of the applicant, but of the fit between a specific person and a specific job. More than half of the employees who quit their jobs within the first year indicate a wrong fit as the reason according to Carrell et al (1995:300).

There is unfortunately no guaranteed recipe to determine whether an individual will be successful either in a job or in tertiary studies. No perfect test exists and ongoing research has to continue to obtain objectivity and validation of the process.

3.9 Criteria for tertiary selection

Academic performance according to Fourie (1992:1) is not easily defined and cannot be expressed by a single mark or symbol. There are no valid norms to evaluate academic achievement. Rademeyer and Schepers (1998:36); Fourie (1992:1) as well as Combrink (1970:3) refer to academic performance in a number of related definitions:

- success in a subject;
- failure in a subject;
- over or under-achievement; or
- poor or no progress at academic level.

Academic achievement is influenced by the:

- ability of a specific person although ability is not necessarily an indication of achievement;
- aptitude of a person, which correlates with situations, opportunities, challenges etc;
- interpretation of achievement by the achieving person. The value that is attached to the achievement, what amount of input led to achievement and the levels of self actualisation experienced; and
- norm or measuring instrument according to which achievement is measured. This norm is usually determined externally (by another person) and influences the level of recognition and value attached to a specific achievement.

Academic achievement is a complex and multi-faceted phenomenon, which encompasses numerous aspects. Knowledge of the factors influencing academic achievement sheds little light on accurately describing academic achievement.

Tertiary achievement in contrast to school achievement is more complex. School achievement is defined as the achievement at school in the results of a final examination according to Monteith (1988:23). At school level a student either passes a grade year or fails it. At tertiary level a student

accumulates credits for individual subjects, although the student may not necessarily be promoted to the next academic year.

As a result of this more complex promotion system, at tertiary institutions, academic achievement is not easily measured. Add to that the problem of:

- diverse study fields;
- differences in requirements and standards in diverse study fields; as well as
- differences existing in different faculties.

Generally tertiary academic achievement is defined as the ability of a student to obtain her degree or diploma within the prescribed period as indicated by the institution according to Fourie (1992:3) and confirmed by Stoker et al (1985:26).

If the method that a student uses in his/her studies could be based on a criterion scale, tertiary achievement could be tuned in more detail. This will result in canvassing the limitations of the pass versus fail dichotomy and a better usable norm will be established. Diverse study fields, differences in evaluation measurements and promotion systems and especially different perceptions of tertiary achievement contribute to the difficulty to lay down a generally accepted norm according to which a student's tertiary achievement can be expressed in a qualitative manner. Different perceptions of what should be used as a point of reference when a norm for tertiary achievement is determined, inevitably result in different norm scales. Examination results obtained in different subjects are the traditional criterion according to which academic achievement is evaluated according to Fourie (1992:4) and Louw et al (1998:150).

Although examination results do not offer a complete representation of academic progress and adaptation, it is regarded as the most significant aspect of these processes. Examination papers in different subjects cover the work of a semester or year. These are meticulously compiled,

administered and marked therefore it is fair to accept that examination results provide a valid and reliable indication of academic achievement.

Kruger (1972:130) suggests the use of examination results as criteria in the following manner:

- The information of pass and fail can be used as dichotomous criterion for academic achievement. The disadvantage is that this criterion does not include all the information about academic achievement;
- The information about the number of subjects passed can be used as criterion. When the requirements of study fields differ the information of candidates is not always comparable; and
- The marks obtained in different subjects can be used as an average or as a total. Once again the different subjects may compromise comparability.

Different methods can be described to utilise examination results as an index for tertiary achievement for example the dichotomy of pass and failure; combining academic achievement; standard marks; and achievement in every subject separately. The practical problem is to manipulate subject results in such a manner that these are comparable because it is important that the standard of different subjects is comparable according to Gouws (1957:49) and Kruger (1972:129).

As a result of the variety of study fields, differences in evaluation measures and other factors it will not always be possible to reach an agreement that will be acceptable to everyone. It is therefore necessary that specific points of departure or assumptions be formulated to use as a basis for the formulation of a criterion for tertiary achievement.

The assumptions used in this study are the following:

- The percentage of a student's final mark in an examination, and specifically the major subjects, is an objective measurement of tertiary achievement;

- A mark obtained in a specific subject is equal to the same mark obtained in another subject, provided the subject level is equal. Factors such as evaluation standards or differences in complexity between different subjects are not taken into account but condoned, because the pass mark is 50% for every subject.;
- The degree of difficulty of different subjects on the same level is the same therefore Personnel Management 1 is not more difficult than Industrial Engineering 1; and
- The prescribed syllabi in one faculty are weighted equally to that of another faculty consequently a first-year course in Environmental Sciences earning 12 credits is equal to a first-year course in Economic Sciences consisting of 14 credits;

Smith (1979:42) confirms the above assumptions as a point of departure in formulating criteria for tertiary selection.

Smit (1992:5) focuses on career success using more objective aspects such as income, job title, promotion and awards as well as more subjective criteria such as the levels of career satisfaction experienced by job incumbents. Louw et al (1998:150) and Gattiker and Larwood (1988:569) declare that career satisfaction correlates with career success.

3.10 Conclusions

Linn (1973:139) states that within a context of predicting a specific criterion, such as academic achievement, the major focus of concern is the predictive validity of the test. This assumes that an acceptable criterion variable is available. This assumption that an acceptable criterion is available obviously involves a giant leap. The use of a criterion variable to investigate the fairness of a test places a very heavy burden on the assumption that the criterion variable is fair.

One of the limitations of this research is that all the definitions of academic performance, as criteria, cannot be covered in the study. Add to this the differences between subjects (some more complex than others), different lecturers (in terms of evaluation and standards) and different study courses, the decision of criteria becomes ever more complex.

Nisbet and Welsh (1976:266) state that:
"The attempt to devise a method of perfect separation of good students and bad students suggests the calculation of the orbit of a satellite: if one knows the student's velocity, direction and density, his path is assumed to be predictable".