EFFICIENCY AND ADVERSE IMPACT OF GENERAL CLASSIFICATION DECISIONS

Celina Druart and Wilfried De Corte
Ghent University, Department of Data Analysis
Henri Dunantlaan 1, B-9000 Gent
celina.druart@ugent.be

ABSTRACT

Classification decisions relate to situations in which a battery of predictors is used to assign individuals to a number of different trajectories. De Corte (2000) proposed a method to estimate the classification efficiency in case the assignment of individuals to trajectories is based on least square criterion estimates. The current paper extends this method to the case where the applicants come from several subpopulations and estimates are no longer only regression weighted. The extension is motivated by the fact that using other than regression based criterion estimates for assigning applicants to the different trajectories may result in classification decisions that show substantially less adverse impact as compared to classifications in which regression based criterion estimates govern the allocation process (De Corte, Lievens & Sackett, 2007). An application of the new analytic method indicates that while classifications based on regression weighted criterion estimates lead to optimal classification efficiency, they also yield substantial adverse impact because many of the most valid predictors, and cognitive ability predictors in particular, show large effect sizes in favor of the so-called majority applicants. Alternatively, general (non regression based) classification decisions lead to a wide range of possible trade-offs between efficiency and diversity where concessions in terms of classification efficiency are compensated by more advantageous levels of adverse impact. The proposed method may be used by practitioners to alleviate the quandary between efficiency and adverse impact in a classification context.

INTRODUCTION

The currently available methods for estimating the outcomes of selection decisions such as selection quality and diversity by and large focus on the *simple selection situation* in which the available applicants all apply for the same single job. However, as recognized by Born and Scholarios (2005), Gatewood, Feild, and Barrick (2008), and Landy and Conte (2004), the simple selection format is not always adequate because organizations also face complex selection decisions, for example *classifications* which involve multiple jobs and an applicant pool that applies for all of the available positions. Additionally, all the presently available procedures for gauging the results of classification decisions (e.g., (Brogden, 1959; Campbell & Knapp, 2001; De Corte, 2000; Scholarios, Johnson, & Zeidner, 1994) focus on the classification efficiency outcome only, disregarding the work force diversity issue. As a consequence, the quality-diversity dilemma that dominates the simple selection research agenda remains hitherto unexplored in case of more complex classification decisions. In addition, the methods assume that the assignment of applicants to the different positions is based on regression weighted predictor composites of the available selection predictors thereby excluding the possibility to explore the selection quality-diversity trade-offs achievable with other than regression based

composites.

De Corte (2000) proposed an analytic procedure to estimate the *classification efficiency*, this is the expected job performance of assigned applicants, in case these applicants are assigned to positions based on several selection predictors and regression-based criterion estimates. As a first step towards resolving the quality-diversity dilemma within the context of classification decisions, the present paper seeks to generalize the latter analytic procedure to the case where the applicant population is a mixture of subpopulations that show different means on the selection predictors. This generalization will result in an estimate for both the classification efficiency and work force diversity goal. In addition, the method is further extended to handle situations where the classification decisions are based on other than regression weighted predictor composites. This additional generalization is motivated by the result on balancing quality and diversity concerns in a simple selection context indicating that non regression weighted composites can lead to a better trade-off between the two concerns as compared to the trade-off achievable by using regression weighted composites (De Corte, Lievens & Sackett, 2007).

The following sections present some basic concepts concerning classification decisions and a short recapitulation of the most general method available to estimate the efficiency of classification decisions. Then, the new analytic method for estimating the double outcome of classification decisions is presented. Next, we illustrate the method using an example application and show how it permits exploring the quality-diversity potential of a classification decision. The merits of the new analytic method and further developments towards integrating the method in a broader decision making framework are discussed in the final section.

METHOD

Classification decisions

Whereas simple selection decisions deal with situations that involve several applicants interested in one position, classification decisions deal with several applicants interested in more than one position simultaneously. Compared to simple selection decisions, where an accept/ reject decision about each applicant is made, classification decisions also involve an assignment decision for each accepted applicant. Obviously, simple selection is a special case of the classification situation, where all applicants from the applicant pool are eligible for one available position. Classification decisions are often encountered in large industrial or governmental organizations, as well as in the startup or reorganization of a plant or a business unit (Born & Scholarios, 2005; Landy & Conte, 2006).

Methods for estimating classification outcomes

The method proposed by De Corte (2000) estimates the outcomes of classification decisions as expected under a *rational selection strategy* meaning that applicants are selected on the basis of the composite predictor information so as to maximize the expected criterion performance of the retained applicants. In simple selections, rational selection obtains when applicants are top down selected on the basis of their scores on the single criterion estimate. For classification situations, a separate criterion estimate, E_j , is developed for each job j and a result proven by (Brogden, 1954, 1955) implies that the notion of rational selection can then be expressed in terms of the so-called augmented criterion estimates where the augmented criterion estimate for job j, V_j , equals $E_j + k_j$ with k_j a position specific augmentation constant chosen so

as to assure that the required position quotas are met. In particular, Brogden's result states that rational selection under differential prediction is achieved when applicants are top down selected on the basis of their highest augmented criterion estimate value and the selected applicants are assigned to the position for which they show this highest augmented criterion estimate value.