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Université de Montréal

Stability of a School Dropout Classification

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Mémoire presenté à la Faculté des Études Supérieures
en vue de l'obtention du grade de Maîtrise ès Sciences
(M. Sc.) en Psychoéducation.

Avril 1999

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Université de Montréal

Faculté des Études Supérieures
Grade octroyé à compter du
07 OCT. 1999
Université de Montréal

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Faculté des arts et des sciences

Ce mémoire intitulé:

Stability of a School Dropout Classification

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Mémoire accepté le: 99-07-08

French Summary

Le décrochage est un problème sérieux tant du point de vue scolaire que social, qui a des répercussions sur la société et la culture. Le phénomène du décrochage scolaire comporte de multiples volets et trouve son origine dès les premières années de fréquentation de l'école. Les causes sont nombreuses et tendent à s'aggraver au fil du temps. Elles peuvent provenir tant des premiers intéressés (des écoliers qui éprouvent une panoplie de problèmes graves) que des institutions (les écoles, les commissions scolaires, les politiques en matière d'éducation des gouvernements provinciaux et fédéral) (Hahn, 1987). Au cours des dernières décennies, les coûts associés au décrochage scolaire, pour les personnes concernées et pour la société en général, ont augmenté (Schwartz, 1996). Les conséquences néfastes pour le décrocheur lui-même sont considérables (Asche, 1993). Qui plus est, le coût élevé du décrochage menace sérieusement la santé sociale et économique de notre société, mettant en péril la productivité de notre nation. La société ne peut se priver de la contribution potentielle de ces personnes, ni assumer le fardeau de la dépendance économique qui en découle habituellement.

Les recherches semblent s'être toujours limitées à étudier les décrocheurs comme groupe psychosocial homogène, se penchant surtout sur les raisons communes menant à l'abandon scolaire (Janosz, 1996). Les études se sont concentrées sur les variables qui influencent le décrochage scolaire, examinant des données comme les mauvaises expériences à l'école, les antécédents familiaux (les familles à faible statut socio-économique et les mauvaises pratiques parentales), le comportement antisocial, les traits de personnalité, les mauvaises fréquentations, le manque de contrôle (Cairns, Cairns & Neckerman, 1989; Elliot & Voss, 1974; Rumberger, 1983; Woods, 1995; Janosz et collaborateurs, 1997 (présentés)).

Des preuves empiriques sont venues appuyer la notion voulant que les caractéristiques des décrocheurs soient différentes et qu'il existe une hétérogénéité des aspects sociaux et psychosociaux au sein de cette population (Cairns, Cairns & Neckerman, 1989; Elliot & Voss, 1974). Plusieurs

auteurs ont suggéré que les décrocheurs ne sont pas tous semblables, voire qu'ils sont différents à de nombreux égards, notamment au titre du comportement, des compétences sociales et académiques, de l'expérience et de la personnalité (Barrington & Hendricks, 1989; Kronick & Hargis, 1990). Par conséquent, les chercheurs ont étudié diverses composantes de cette population dans l'espoir de comprendre leur diversité sociale et psychosociale (Janosz et collaborateurs, 1996). L'identification de divers types de décrocheurs risque de lever le voile sur les divers cheminements qui mènent à l'abandon scolaire (Janosz, Catalano, Hawkins, 1995). D'après Janosz (1995), non seulement existe-il une corrélation parmi les études sur le décrochage, mais les variables indicatives servant à identifier les décrocheurs en tant que groupe homogène peuvent mener à des constatations erronées qui risquent de dissimuler des relations importantes pour un autre groupe de décrocheurs.

Des études ont démontré que cette population peut être classée en plusieurs catégories homogènes, fondées sur des critères psychologiques, sociaux et des critères de comportement similaires (Janosz et collaborateurs, 1996). D'après Brennan (1987), l'élaboration et l'utilisation d'une typologie ou d'une classification peut aider à comprendre les divers cheminements amenant une personne à abandonner les études. De plus, la classification joue un rôle dans les travaux traitant des causes et des effets en décomposant les éléments hétérogènes de cette population (Brennan, 1987).

Les chercheurs ont proposé divers modèles de classification qui tiennent compte de la diversité de cette population et qui regroupent les sujets par des catégories homogènes fondées sur les caractéristiques de la personnalité et la dynamique des rapports à l'école ou de la vie quotidienne. Janosz et ses collaborateurs (1995) ont donc proposé une typologie établie d'après des variables liées aux études, dont les résultats académiques, les problèmes de comportement à l'école, l'assimilation des connaissances et le degré d'intérêt pour les études. Cette typologie classe les étudiants selon quatre catégories homogènes qui représentent les caractéristiques suivantes : le *décrocheur discret* démontre beaucoup d'intérêt pour les études, obtient des résultats peu élevés et ne manifeste aucun problème évident de comportement à l'école; le *décrocheur désengagé* démontre peu d'intérêt pour

les études, obtient des résultats moyens et manifeste des problèmes légers ou moyens de comportement à l'école; le *décrocheur sous-performant* démontre peu d'intérêt pour les études, obtient des résultats très faibles et manifeste des problèmes légers ou moyens de comportement à l'école; tandis que le *décrocheur inadapté* démontre peu d'intérêt pour les études, obtient des résultats peu élevés et manifeste des problèmes graves de comportement à l'école.

L'objectif premier de cette étude consistait à évaluer la stabilité du modèle de classification des décrocheurs proposé par Janosz et ses collaborateurs (1995) afin d'en vérifier la fiabilité. Il s'agissait d'abord de comparer la classification des sujets dans la période 1 et la période 2 et d'analyser la stabilité des sujets sur une durée de six mois. L'étude a ensuite examiné si la stabilité du modèle de classification était influencée par le risque de décrochage scolaire d'un sujet donné en vue d'évaluer la capacité prévisionnelle de cette typologie pour classer les sujets.

Les résultats de l'étude révèlent une forte corrélation entre la classification des sujets aux périodes 1 et 2, ce qui indique une bonne constance ou stabilité générale du modèle. Les constatations indiquent également que la stabilité de la typologie varie selon le risque de décrochage du sujet étudié. En effet, la relation entre la classification des périodes 1 et 2 était modérée par le risque de décrochage. À l'instar des étudiants à faible risque, la classification était stable pour les étudiants à risque élevé. Enfin, l'étude a démontré que le fait qu'un sujet soit classé dans une catégorie donnée dans la période 1 augmentait de manière appréciable la probabilité qu'il soit également classé dans la période 2, tandis que le risque de décrochage d'un sujet n'augmentait pas la valeur prévisionnelle de la typologie pour classer les sujets.

Les résultats de l'étude servent à valider la typologie proposée par Janosz et ses collaborateurs (1995). En outre, les conclusions ont des répercussions importantes, tant sur le plan clinique que sur celui de la recherche. Les résultats sont utiles pour l'énoncé général à l'égard du processus du décrochage scolaire et de l'exploration plus poussée du modèle de classification de Janosz et de ses collègues (1995). On prévoit que le modèle de classification devienne un instrument

essentiel au repérage des étudiants à risque permettant d'intervenir adéquatement auprès de cette population.

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ACKNOWLEDGEMENTS

To Michel Janosz, for all of your time, perseverance, guidance, and support;
To Lisa, for your compassion, patience, understanding, and sense of humour;
To my Safta, for your courage and strength;
To my family, for your moral support and guidance;
To my friends, for listening and understanding.

Thank you for making these past several years such a challenging and rewarding learning experience.

THEORETICAL REVIEW

1. Overview

Dropping out of high school is a serious educational and social problem, which is influenced by societal and cultural factors. The dropout phenomenon is a multifaceted problem which starts early in a student's life and which has many causes, and grows incrementally worse with each successive year. It is a problem that has both supply-side causes (schoolchildren suffering from a host of messy problems) and institutional aspects (encompassing the schools, the school boards, and provincial and federal policies) (Hahn, 1987). In the last few decades, both the personal and social costs of dropping out of school have increased (Schwartz, 1996). The negative consequences for the individual dropout are extensive (Asche, 1993). Moreover, the high incidence of dropping out poses a serious problem to the social and economic health of our society, and is threatening the productivity of our nation. Society cannot afford to lose the contributions these individuals have the potential to make, nor can it afford to pay for the dependencies that often follow dropping out of school.

Local school boards and provincial education ministries employ widely different methods for defining dropouts. Generally, a dropout is defined as a student who has dropped out of school for reasons other than promotion, transfer, graduation, or death, including those who were dropped by the schools because of excessive absence (Rumberger, 1987).

2. Incidence

In a study undertaken by Statistics Canada in 1991 entitled "After High School: The First Years" found that 63 per cent of youths aged 18 to 20 were high school graduates, 16 per cent had dropped out, and 21 per cent were in high school. By 1995, 85 percent of these same young people had graduated, resulting in a dropout rate for that group of students of 14 percent (Statistics Canada, 1994). In absolute numbers, 160, 000 youths in 1995 had left high school without completing their diploma. Across Canada last year, 932, 000 people aged 18 to 30 had not finished high school, 17.3 percent of that age group, according to Statistics Canada (Statistics Canada, 1995). Quebec had the

highest dropout rate of any province, with a rate of 19 per cent (Statistics Canada, 1997). Montreal is still recognized with having the country's highest dropout rate, close to 30 percent. The high school completion rate has remained relatively stable over the past several years since a marked increase in the 1980's (NCES, 1994). Finally, dropout rates vary widely among social groups. Dropout rates are higher for members of racial, ethnic, and language minorities, for men, and for persons from lower socioeconomic status (Rumberger, 1987).

3. Reasons

The reasons students drop out of school are complex and cumulative, and can be divided into school and personal factors. School factors include reasons such as: didn't like school in general or a particular transfer school, was failing, getting poor grades, or couldn't keep up with school work, didn't get along with teachers and/or students, didn't fit in, didn't feel safe. Personal factors include reasons such as: got a job, had a family to support, or had trouble managing both school and work, got married, got pregnant, became a parent, wanted to have a family, or had a family to take care of, help parents and siblings through a financial crisis, had friends who dropped out, wanted to travel, had a drug or alcohol problem (Hahn, 1987; Schwartz, 1996). Dropouts themselves report a number of different reasons for leaving school, with marked differences reported by different social and economic groups.

4. Consequences

The social, psychological and economic consequences of dropping out of high school are enormous. The issue of dropping out cannot be separated from issues affecting total economic and social structure. These issues include poverty, unemployment, discrimination, the role of the family, social values, the welfare cycle, child abuse, and drug abuse. Studies have shown that possible consequences of school abandonment include: limited employment opportunities, significantly higher

rates of engagement in high-risk behaviours such as premature sexual activity, early pregnancy, delinquency, crime, violence, alcohol consumption, drug abuse, and suicide (Dessureault, 1997; Kasen et al, 1998; Guagliardo, 1998). In addition, studies have found that early school abandonment leads to poorer mental and physical health (Woods, 1995). Finally, dropouts are more likely than other individuals to become dependant on the welfare system and other social programs throughout their lives, and live below the poverty line (Woods, 1995; Hepburn and White, 1988). According to a report published by Schwartz (1996) each year's class of dropouts will cost North American society more than $200 billion during their lifetimes in lost earnings and unrealized tax revenue.

By leaving high school prior to completion, most dropouts have serious educational deficiencies that severely limit their economic and social well-being throughout their adult lives (Rumberger, 1987). A dropout's lower level of educational achievement results in stern economic consequences (Rumberger, 1987). Employment opportunities for the pool of dropouts are more limited, because today's economy requires of the labour force increased literacy, more education, and lifelong learning. As advanced skills and technical knowledge become more common requirements for most high paying jobs, the prospects for those who have not completed high school are increasingly dismal and the economic gap between those with a high school diploma and those who drop out is likely to grow (Schwartz, 1996). The relative economic disadvantage of dropping out of high school could be even greater in the future as the skill requirements of many jobs could be altered because of the increased use of new technologies. Dropouts will be less able to learn new skills and adapt to a changing work environment.

According to a 1997 Statistics Canada "Nation Series" report, 73.3% per cent of all Canadians with a post secondary degree or diploma had a job (Statistics Canada, 1997). Among Canadians with less than a high-school diploma, only 35.1 per cent were employed. The study found that between 1990 and 1997, jobs for highly educated Canadians increased by 1.8 million. Among poorly educated Canadians, the job loss totalled 962,000. In a study undertaken by the Canadian Youth Foundation

in 1988 found that dropouts held 26 percent of all Canadian jobs (Posterski, 1989). By 1996, their share had sunk to 19 percent (Statistique Canada, 1997). Finally, in a 1996 study undertaken by the Quebec government examining the standard of living in Quebec, found that the largest group of welfare recipients was in the prime of their working lives, between the ages of 30 and 44. The study discovered that the majority of these welfare recipients failed to graduate from high school (Bureau de la Statisque du Quebec, 1997).

5. Predictors/Risk factors

A large body of empirical research has identified a wide range of predictors and risk factors that are associated with dropping out. Studies provide powerful support for the study of this sourceb of influence. Researchers have been successful in identifying critical elements that foreshadow a student's decision to drop out of school. A specific situation may not actually lead to dropping out, but sets of situations appear to identify the potential to do so. Some risk factors are more likely precursors of dropping out of school than others. Likewise, the probability of a student dropping out of school increases as the combination of risk factors becomes more multifaceted. Factors can be grouped into several major categories, which include: school-based, family-related, and individual specific. Within each of these categories there can be a large number of specific factors (Rumberger, 1987; Janosz, LeBlanc, Boulerice, Tremblay, 1997). As will be outlined below, other factors are involved in an individual's decision to either stay in school or to leave before graduation (CDHR, 1992).

5.1 School-related

The processes leading to academic success or failure in school are likely to be established early in a child's school career (Ensminger & Slusarcick, 1992). Moreover, there is a general belief that the act of leaving high school is the culmination of a long pattern of poor school adjustment (Barrington

and Hendricks, 1989). According to Fitzsimmons and colleagues (1969) it has long been acknowledged that many of the causes of high school dropout, and signs of impending dropout, are evident early in elementary school. Formative experiences during the primary grades establish the conditions under which various factors come into play at the secondary level (Entwisle and Hayduk, 1988). Success in the elementary grades diminishes the possibility of later dropping out of high school. A study undertaken by Finn (1989) found that by third grade, students who eventually drop out of high school were significantly different in behaviour, grades, retentions, and achievement scores from those who eventually graduate. By high school a student's academic self-image, level of achievement, study habits, and general receptiveness to schooling are already well established (Entwisle and Hayduk, 1988).

School related factors exert a powerful influence on students' decisions to leave school (Rumberger, 1987). Poor academic performance and abilities in the basic skills as measured by grades, test scores, and grade retention are the strongest school-related predictors of dropping out. Studies found that students who repeated one or more grades were twice as likely to drop out than those who had never been held back, and those who repeated more than one grade were four times as likely to leave school before completion (Hess, et al. 1987; Wood, 1994). In addition, low basic skills, below average intellengence measures, being overage for one's grade, frequent moves to different schools, and deficient school support systems also correlate with a potential to leave school early (Hahn, 1987). Hess and colleagues (1987) found a strong correlation between repeated school tardiness, absenteeism, truancy, and dropping out. In addition, some students are too scared to attend school regularly, feeling tremendous fear and insecurity when they enter the school building each day. Furthermore, behavioural problems and disciplinary infractions were shown to be associated with school abandonment. Undiagnosed learning disabilities and language difficulties may lead to students dropping out (Hahn, 1987). Finally, many dropouts attend schools with very poor facilities, inadequate teaching staffs, and other conditions that affect their performance in school and ultimately

their decision to leave (Rumberger, 1987). Contrarily, a positive school environment which promotes programs to keep young people in school, hires and trains good teachers, and advances individual initiatives, has demonstrated an ability to counterbalance the impact of being at a high risk of dropping out (CDHR, 1992).

5.2 Family

5.2a Structural characteristics

Family structure, composition, and socioeconomic status can greatly influence the academic achievement of a child. Studies have demonstrated that the degree and nature of the family dynamics as exhibited by such factors as a stressful/unstable home life, high job and home mobility, single-parent families, minority membership, and the absence of learning materials and opportunities in the home influence are all risk factors that contribute to the academic troubles of a child (Horn, 1992).

A number of socioeconomic factors are associated with the likelihood that individuals will leave school before they graduate. Poverty, low socioeconomic status, and recipient of welfare, are all strong predictors of dropping out. Many dropouts leave school because they want to or feel they have to work to financially help out their families (Rumberger, 1987). In a study undertaken by the US Department of Education students from low-income families were 2.4 times more likely to drop out of school than are children from middle income families, and 10.5 times more likely than students from high income families (NCES, 1994). In another American study Braddock & McPartland (1992) found that twenty five percent of all poor urban high schools had dropout rates of fifty percent or higher, and that school-leaving rates tended to increase with the proportion of the student body classified as poor. Finally, Hahn (1987) found that on every reasonable indicator of hardship, from low income to limited educational background, the disadvantaged respondents were three times more likely to drop out than the advantaged.

5.2b Process characteristics

Parental attitudes, perceptions, influences, and motivations towards schooling can have a powerful, cumulative influence on the academic performance of a child. The environments which parents foster can either promote or discourage learning. Particular family-related factors associated with dropping out include low educational and occupational attainment levels of parents, siblings' non completion of high school, and general job dissatisfaction of the total family occupational pattern. (Rumberger, 1987; CDHR, 1992). Moreover, parental negative or indifferent attitudes toward schooling are all associated with the likelihood that students will leave school before graduation. Parents who fail to encourage engagement in intellectual tasks may have negative effects on academic development. Coming from social or cultural groups that deemphasize intellectual pursuits may create the environmental conditions that lead to a decline in intellectual gains. Finally, studies indicate that dropping out is concentrated among youth whose parents are dropouts, thus advancing the notion that the problem may be rooted in social/cultural factors (CDHR, 1992).

5.3 Individual Factors

Numerous other predictors and risk factors of dropping out of school, based on individual characteristics and life predicaments, have been documented. Firstly, studies have shown that specific personnality traits are strongly associated with those individuals who leave school. Dropouts have lower levels of self-esteem, less sense of control over their lives, and poor attitude and expectations than other students. Dropouts tend to believe that they don't have control over their lives, that chance and luck are important, and that something always seems to stop them from getting ahead. Conversely, graduates feel that they have a great deal of control over their lives, a belief known to promote educational achievement (Schwartz, 1996).

Secondly, numerous studies have found that students attitudes and motivation strongly influence their decision to stay in or leave school, and their further education beyond high school.

Saint-Laurent and her colleagues (1997) found an interrelation between achievement and person-motivational variables in students at risk of school failure and students not at risk. Results show that students with and without academic problems are different with respect to certain motivational-affective variables. Motivation was found to be predictive of academic success. Other studies have shown that intrinsic motivation influences perceived competence and that perceived competence influences subsequent academic achievement. Goldberg and Cornell (1998) found that if potential achievers are to become competent and able students, teachers must focus on activities designed to foster intrinsic motivation.

Next, a multitude of studies have demonstrated that below average IQ scores on all components of the test, poor academic performance in elementary school, and manifestations of conduct, attention and/or hyperactive disorders at a young age, are all strong predictors of poor high school academic achievement (McCall et al, 1973; Hetherington & Parke, 1993). Students who struggle academically and behaviourally in high school have a greater probability of dropping out than students who do not exhibit those difficulties. Studies have found that students with low IQ scores, and who subsequently drop out of school, have been found to have difficulty dealing with and comprehending abstractions, difficulty acquiring new knowledge or learning from experience, and trouble solving perceptual, mental or social problems in new or unfamiliar situations . A variety of studies have demonstrated that not only do hyperactive children run into conflict with the various adults in their environment, but they also perform more poorly in school, present classroom management problems for the teacher, have difficulty with peer relations, and have a higher than average probability of abandonning school (Ross & Ross, 1982; Weiss & Hechtman, 1986).

Fourthly, both marital status and dependent children have a dramatic effect on school leaving, especially among women. Pregnancy is one of the most common reason's that females leave school (Manlove, 1998; Stevenson et al, 1998). Household responsibilities, notably child care, render the

completion of high school studies difficult. According to Statistics Canada report dropouts were much more likely than graduates to be married or to have dependent children (CDHR, 1992).

Lastly, several other factors found to be related to individuals who abandon school are worth mentionning. Problems such as substance abuse, legal problems, delinquency, are known predictors of school dropout (Janosz & LeBlanc, 1996). A students geographical inhabitants has been shown to be a predictor of school abandonment. Students from rural areas are somewhat more likely than city dwellers to be school dropouts (Rumberger, 1987). Researchers have also found that working can contribute to a student dropping out. Some research shows that student employment begins to correlate with dropping out with increased number of hours worked (Mann 1986, 1987). Finally, students with disabilities or health-related illnesses are more likely than those without to be school dropouts. In the Statistics Canada study, physically disabled youths reported feeling alienated and having a difficult time in school (CDHR, 1992)

6. Research

Although empirical and clinical evidence underscore inter-individual differences among dropouts, research has traditionally studied school dropouts as a psychosocial homogenous group. Studies have focused on variables influencing school dropout such as negative school experience, family background (low socioeconomic status families and poor parenting practices), antisocial behaviour, personality traits, deviant peer association, an external locus of control (Cairns, Cairns & Neckerman, 1989; Elliot & Voss, 1974; Rumberger, 1983; Woods, 1995; Janosz et al.,1997).

Several authors have suggested that dropouts are not all alike and that they differ on many aspects such as behaviour, social and academic skills, family experience, and personality (Barrington & Hendricks, 1989; Kronick & Hargis, 1990). Empirical evidence has been brought forth supporting the notion that dropouts have dissimilar characteristics and that psychological and social heterogeneity amongst the dropout population exists (Cairns, Cairns & Neckerman, 1989; Elliot & Voss, 1974).

Janosz (1995) stressed the acknowledgement of sample heterogeneity among school dropout populations and the importance in studying them as distinct group of individuals. Researchers have started to study the different psychosocial make-up of the dropout population in the hopes of disentangling their social and psychological diversity and to uncover different pathways toward school attrition (Janosz et al., 1997).

7. Theoretical and Methodological Issues with Classification

Recognition of different types of dropouts have led to a classification approach to the school dropout phenomenon. According to Brennan (1987) the construction and use of categories or classification schemes can help to understand the diversity of pathways that can lead an individual to react and behave in a certain manner. Moreover, classification plays a role in causal and explanatory work by untangling the numerous factors that influence an individual's actions. Classification into homogeneous types is crucial in the study of the progression, duration, and outcome of specific behaviours. Finally, classification functions to give social relevance to the subject population, facilitate efficiency in statistical compilation, and promote analytical theory that can be tied to empirical data (Bailey, 1994).

An efficient classification scheme serves as a descriptive tool in providing an exhaustive array of types or categories. Moreover, it allows for recognition of similarities among cases and allows a differentiation between different cases. Dissimilar cases can be separated for analysis, rather than remaining mixed together. A good typology allows for quick and easy comparisons of types, giving a quick appraisal of the similarities and variation and the general qualities inherent in the typology. Ultimately, it provides for the study of relationships and the specification of hypotheses concerning these relationships. Finally, typologies can be useful as heuristic devices to highlight the relevant theoretical dimensions of a type, reduce complexity and achieve parsimony (Hudson et al, 1982).

Consideration of differences in school dropouts is crucial for the advancement and

strengthening of our understanding of this population. Classifying dropouts into various homogenous subtypes that are significantly different from one another on important psychosocial factors can have important research implications. Classification alone is seldom the end product of research. In one phase is observations of existing things by a range of classification procedures and the remaining phase is conceptual and concerns the relation of meanings associated to the classification. Classification can be used to test hypotheses, models, predictions and to confirm theoretical systems concerned with student dropouts. Moreover, grouping dropouts into homogenous groups can lead to a better understanding of the complex etiology of school dropout by a greater understanding of the underlying processes involved in the phenomenon (Janosz, 1997; Finn, 1989; Rumberger, 1987). Classification procedures can be valuable tools in the understanding of the educational and developmental progression associated with students at risk of dropping out of school.

By exploring the etiology and psychological dynamics of each classification type, the mechanisms that drive dropout behaviour and the role of individual differences in contributing to school abandonment can be studied. Janosz and colleagues (1996) states that distinct knowledge of the heterogeneity of the school dropout population will open up different pathways for research. The development of a typology of school dropouts "permits the testing of various models or processes leading to abandonment of school and its trajectory relationship with specific characteristics of the individual and his setting" (Janosz, LeBlanc, Boulerice, Tremblay, 1997 p.1).

In addition, classification information holds significant implications both for assessment and intervention with students at risk of dropping out of school. Knowledge of a student's group membership may prove to be an essential element in the planning of more effective school dropout prevention strategy. By being able to localize individual risk factors associated with each potential school dropout classification, a more focused intervention plan which addresses the primary deficiencies of the individual can be implemented. Thus, allowing for a better appropriation of intervention strategy. A variety of interventions techniques are available and some may be more useful

than others with different types of dropouts. For example, a highly motivated student who is at risk of abandoning school because of an impeding learning disability might benefit more from interventions geared towards the implementation of learning strategies, than would an at risk student who has great difficulty controlling his/her impulses and sustaining his/her attention for long periods of time who might benefit more from behaviour modification type interventions (eg, token economy).

The above has highlighted the benefits and advantages of using classification techniques when undertaking statistical research. However, it would be negligent not to discuss the limits, risks, and methodological problems related in using classification methods and models when studying subjects.

Inevitably, when classfiying subjects within groups based upon a set of rules and measures, the risk exists that some subjects will be lost because they do not fit the predetermined set of criterias. Subjects may be omitted from group classification because they have missing data necessary for classification, the criterias for inclusion were to rigid and resulted in the exclusion of subjects, or a methodological error exists in the construction of the classification scheme or the tools used to assess subject group association. By not classifying all subjects potentially important data and subsequent findings may be lost. The heuristic value of the typology is compromised if not all subjects in a given study are able to be classified.

Subsequently, categorization can distract attention from the complexity of the individual case. Studying subjects within the context of several different groups limits exploration of individual subject characteristics. Individual differences may too easily become submerged in group means and the special factors that are crucial for individuals who are extreme or special in one way or another readily go unnoticed (Hinde, 1998). By excusively focusing on certain variables and data used to classify subjects within the typology groups, important subject information that may potentially serve to enhance or modify the findings of the research may go undetected. Relatedly, classification in not a suitable method for testing exceptions. Classification attempts to identify groups of individuals by theory or problem-related criteria, and categories are composed of individuals who have similar

configurations of specific attributes. Thus, pronouncedly dissimilar and extreme measures on variables not of specific interest to the researcher may be virtually ignored.

Like all methodological procedures, classifications may be flawed and not hold up to the empirical standards of replicability, construct and external validity across diverse populations (Robins et al, 1998). The observations and results obtained based on group classification may not replicate or repeat under different circumstances. This may be caused, for instance, if the criteria for group inclusion is to flexible and not well defined. A small change in a variable used to determine group classification would result in the subject changing categories under different circumstances and set of conditions. Groups and social relations would be restricted in time and place. Next, The variable definitions and criteria set to determine group classification and classification construction may not accurately reflect or measure what they are intended to measure. Furthermore, similiar group classifications and results derived from those classifications may not generalize from that research setting and subject population to other settings and populations. Finally, as a result of all potential the methodological restraints it would appear that a test of typology stability in order to validate its use would be of the utmost importance.

8. School dropout classification

Researchers have proposed several models of classification which consider the psychosocial heterogeneity of the dropout population and which group the subjects into certain homogenous categories based on similar psychological, social, or behavioural criteria. Variables such as personality characteristics, interactional dynamics at school, and experiences of daily living, have all been used to group students who drop out of school into various homogenous groups. Although many of the studies have failed to empirically test their proposed classification subtypes, nevertheless the suggested classifications serve to highlight the heterogeneity of the school dropout population, and the importance of studying these subjects within the confines of a classification scheme.

Elliot and Voss (1974) in their book Delinquency and Dropout explored the relationships between delinquency and high school dropout and identified three types of dropouts. Educationally Handicapped dropouts are very low achieving students who drop out because they can not handle the academic rigours of school. Secondly, Involuntary dropouts are intellectually capable students who abandon school because of extrinsic reasons (eg, financial obligations) over which they have limited control. Finally, Intellectually Capable dropouts possess the intellectual abilities to complete their schooling but leave school prior to graduation.

In a 1975 study, Epicum and Murray proposed the following six types of dropouts. 1) *Accidental* dropouts who are described as having all the intellectual capacity to terminate their schooling but who prefer to join the job market. 2) *Maladjusted* dropouts who are described as having great intellectual or behavioural difficulty as not to be able to handle the rigours of school. 3) *Disfavoured* dropouts are individuals who grow up in a socioeconomically disfavoured environment and who's outlook on life is such that school does not take high priority. 4) *Delinquent* dropouts resemble the disfavoured but are individuals who have developed socially inadequate behaviour. 5) *Female* dropouts are girls who abandon school because of marriage or pregnancy. 6) *Marginal* dropouts are adolescents who possess the abilities (intellectual, creative, behavioural) to succeed academically but who are totally disconnected from school.

Charest (In Roy, 1991) proposed a five type classification of school dropouts. Charest labelled dropouts who prefer entering the labour force over continuing with their schooling as dropouts *Oriented Towards Work*. In addition, he termed dropouts who are unmotivated, have limited parental support, and come from a low socioeconomic background as *Disfavoured* dropouts. Furthermore, Charest called dropouts who abandon school because of intellectual deficiencies in handling school curriculum as *Maladjusted* dropouts. Moreover, he referred to dropouts who reject the constraints imposed on them by the academic setting and society at large as *Marginal* dropouts. Finally, dropouts who abandon school for reasons out of their control were coined "*Out of Necessity*" dropouts.

In a 1991 study, Violette outlined five major reasons why adolescents withdraw from high school before acquiring their graduation diplomas. The first category of adolescents are those who drop out due to academic difficulties. The next group of adolescents who leave school early are those who exhibit behaviour problems, personal difficulties and delinquency related behaviour. The third group of adolescents are those who choose the job market instead of school, either by choice or due to financial pressure. The fourth classification of adolescents are those who are faced with external constraints such as pregnancy and illness, and must therefore withdraw from school in order to address those needs. Finally, the last category of adolescents are those described as false dropouts. This category includes intellectual or physically handicapped students, students who inscribe into the army or other professional organizations, and students who are forced to withdraw from school due to domicile relocation.

Kronick and Hargis (1990) in Who Drops Out and Why: And Recommended Action suggested a typology of dropouts integrating personal characteristics, school experience, and moment of leaving school. The first category of dropouts are referred to as *High-Achiever Pushouts*, those students who are expelled from school because of problem behaviours. Dropouts in this category do not display any learning difficulties and generally obtain above average grades in school. The second category of dropouts are referred to as *Low-Achiever Pushouts*. Dropouts in this group have a history of school failure, and react with aggressiveness and rebelliousness to the frustration caused by this failure. Unlike the previous group, the next category of dropouts referred to as *Quiet Dropouts* do not react with frustration and anger to academic failure. They do not manifest externalized problem behaviours, and most go unnoticed until they drop out of school. Finally, the last group labelled *In-School Dropouts* reach the last grade of high school but fail the final exams because of serious weaknesses in their knowledge of exam material. A large proportion of these students exhibit signs of reduced motivation resulting from external circumstances (eg. family problems, illness).

Cairns and colleagues (1989) explored the correlates and determinants of early school

dropouts. They concluded that the severity of school (academic) and personal problems (problem behaviour) vary greatly between dropouts, and that academic achievement and problem behaviours are major dimensions for differentiating dropouts. Their findings support the hypothesis of heterogeneity amongst the school dropout population.

Jarjoura (1993, 1996) addressed the consequences of treating all school dropouts as a heterogeneous group. Jarjoura (1993) differentiated school dropouts in eight groups according to their reasons for dropping out: 1) to get married, 2) because of pregnancy, 3) because of poor grades, 4) dislike for school, 5) because of problems at home, 6) because of financial reasons or employment, 7) because they were expelled, 8) and because of other reasons (military involvement, school dangers). Results indicated that the effect of dropping out on violent offenses, thefts and selling drugs, differed according to the reasons for dropping out. For example, dropping out because of a disinterest in school or for unspecified reasons was related to all types of deviant behaviour, whereas dropping out because of domestic problems was not related to any of the delinquent behaviours.

RESEARCH FOCUS

1. Classification proposed by Janosz

Janosz and colleagues (1995) proposed a school dropout typology based on school related variables: *achievement scores*, *problem behaviour*, *grade retention*, and *commitment level*. Their study empirically confirmed the psychosocial heterogeneity in the school dropout population. The study, using a French-Canadian sample of adolescent students, classified dropouts into four homogenous categories illustrating the following characteristics: *Quiet Dropouts* exhibited high levels of commitment to education, low achievement scores, and displayed no evidence of school misbehaviour. They comprised approximately 40% of the dropout sample . *Disengaged Dropouts* exhibited low levels of commitment to education, average performance in school grades, and displayed average to low levels of school misbehaviour. They comprised approximately 10% of the sample distribution. *Underachiever Dropouts* exhibited weak levels of commitment to education, very poor school performance, displayed average to low levels of school misbehaviour. They comprised approximately 10% of the sample distribution. Finally, *Maladjusted Dropouts* exhibited weak levels of commitment to education, poor performance in school grades, and displayed high levels of school misbehaviour. They comprised approximately 40% of the sample distribution.

Initial evidence on the reliability, interpretability, and validity of the dropout subtypes has been positive. For example, in a study undertaken by Janosz, Catalano, Hawkins (1996) the heterogeneity of the dropout population with an American longitudinal sample of adolescents was examined. The study confirmed the prevalence of Janosz's et al (1996) Quiet and Maladjusted type dropouts as being the most prevailing types of dropouts. The study supports the convergent and cross-cultural validity of the typology.

Janosz and Le Blanc (1998) propose to use this typology to be better understand the different dropout trajectories possible. They demonstrate, for example, that the individual, family, and social risk factors of Quiet and Maladjusted group members are quite dissimilar. Therefore, it may be preferable to study etiologies of school dropout as opposed to one general developmental model.

Janosz (1995) also claims that the typology could serve to better guide high school dropout prevention by supporting a differential approach and a more focused intervention plan geared to the different potential dropouts. Finally, while interesting and presenting heuristic value, Janosz (1995) does not address several elements in the validation of the typology that may largely affect the use of the typology in clinical purposes. Specifically, Janosz (1995) does not present findings related to the stability of the typology and its' predictive validity.

2. Stability

An important aspect of any classification model is its stability in classifying subjects over a time interval. Studying the stability of at-risk students within the context of a classification model has both theoretical and dropout prevention and intervention implications. Stability is viewed as an index of reliability in which the test is thought of as a parallel with itself. In order to substantiate the use of a dropout typology as a valide classification instrument a test of the accuracy and consistency in classifying the same individuals over different time periods is needed. Furthermore, the stability of the proposed model must be examined as part of an internal validation of the classification model. If the typology is not stable this would render any conclusion drawn from the results of the typology susceptible to error. The study of stability can help in gaining a better understanding of the processes involved in the classification of subjects. For instance, how subjects are classified and under which circumstances they remain stable within their respective groups can be studied. Postulates and theories could be used to help explain the classification model as a function of results of the test of stability.

For prevention and intervention purposes a clear and reliable classification model with consistent findings at different testing intervals is of vital importance. Postulates based on prevention procedures or intervention approaches could be analysed with reference to the classification scheme that emerges at both testing intervals. Let us assume, for instance, that differential strategies were

developed specific to the various differences that is assumed to exist within each of the dropout groups. It is only in presuming that sufficiently high stability of group membership is maintained over time, that efforts to develop such approaches would be worthwhile. In Janosz et al (1997) typology, for example, subjects in each dropout group possess specific academic related characteristics. Different clinical strategies geared to address these different characteristics could be developed and used with subjects depending on which group they are classified in. However, if subjects do not remain stable in their classification, then such a differential approach would be futile. Subjects characteristics would be constantly changing, and their need for various forms of prevention or intervention would also vary.

2.1 Scenario of change and stability

Several possible patterns of classification could emerge. Firstly, subjects could remain stable, thus being classified in the same groups in both time intervals. A certain amount of intra group mobility might be evident, but insignificant to affect the overall stability of the classification scheme. Refer to table 1 for an illustration of subject stability.

Secondly, the classification scheme may show overall instability, yet display stable formations of change. For example, a linear pattern of group movement might prevail, in which certain trends emerge. Subjects may progress from one group to another over time. Hypotheses related to the relationship between group classification and dropout progression may be tested. For instance, students who are initially considering the possibility of dropping out of school may be at the outset classified in a specific group. As their desires and behaviours align with their intentions to abandon school students may progress linearly from one group to another, eventually being classified in the last group before the actual act of leaving school. Refer to table 1 for an illustration of linear mobility.

Finally, random inter group mobility might be observed, in which there is no clear pattern of group membership. Subjects classified in one group in time 1 are randomly classified in any one of the four groups in time 2. Table 1 illustrates an example of random subject classification.

Table 1. Potential classification status of hypothetical models in Time 1 and Time 2

Classification in time 1	Classification in time 2			
	A	B	C	D
A	X(O)	O(Y)	O	O
B	O	X(O)	O (Y)	O
C	O	O	X(O)	O (Y)
D	O	O	O	X(O)(Y)*

Legend: X = stability; O = random; Y = linear pattern of change

3. Predictive validity of the typology to classify all subjects

Another ambiguous attribute of Janosz's typology resides in the absence of findings on the predictive validity of the typology to classify all subjects. In effect, Janosz and colleagues (1995) suggests the use of the typology on potential dropouts, students at risk of dropping out but who are presently still in school. Although it allows for the classification of students who would likely receive their graduation diplomas, it was conceived to be employed with students who present a high risk of dropping out. The typology was developed solely using a sample of students who had dropped out of school and was not intended to distinguish between potential graduates and potential dropouts. Therefore, the true predictive value of the typology in classifying all subjects is not known. This a significant problem being that the rules of classification, as outlined by Janosz (1995), permit for the majority of students to be classified according to the four categories, irrespective of their risk of dropping out.

Janosz (1995) recognizes this gap and purposes using the typology only with a sample of students at-risk of dropping out of school. Firstly, the author recommends the need to screen the potential dropout with the help of reliable procedure (Janosz et al., 1997) and then to classify these students according to the different classification types.

Based on the predictive research results of two Quebec adolescent samples, Janosz and his

colleagues developed a procedure capable of calculating a student's probability of dropping out of school (Janosz et al., 1997; Janosz & LeBlanc, 1997). The dropout risk score is calculated using a formula containing student scores on three MASPAQ scales (Le Blanc, 1996): the *School Achievement Scale, Commitment Towards Schooling Scale*, and *Grade Retention Scale*. The results of logistic regression analyses gives for each of the predictors (achievement, commitment, and retention) a corresponding weight (beta coefficient) which is used in the calculation of subject dropout risk. Thus, the raw score obtained in each of the three scales is weighed by its coefficient and the probability of a student dropping out of school is calculated according to these adjusted scores. The calculation of subject dropout risk adheres to the following equation:

$P = \exp((score_1 + score_2\ score_3) + cste) / (1 + \exp((score_1 + score_2\ score_3) + cste)$ where P= probability of dropping out (min. 0, max. 1); $score_x$ = weighed score from a scale; cste = prediction model constant, determined from the marginal frequencies of student dropout according to the sample of reference.

Accordingly, the relative risk of dropping out for each student can be calculated. Dropout probability scores ranged from zero to one hundred percent. Subjects with a probability of less than fifty percent are classified in the low dropout risk category, whereas subjects with a fifty percent probability or greater are placed in the high dropout risk category. Janosz and his colleagues demonstrated their ability to correctly classify more than eighty percent of future graduate and dropout students with this formula (Janosz et al., 1997; Janosz & LeBlanc, 1997).

In creating a typology as a function of only students who abandoned school, it is possible that this classification may be biased in favour of students presenting a high risk of dropping out. Thus, this may have an affect on the stability of the typology. Moreover, if the typology, in effect, is a typology of potential dropouts and not a typology adapted for non at-risk students, the classification

stability may vary according the level of dropout risk. This study will test the validity of the screening procedure proposed by Janosz and colleagues (1997) and assess whether this procedure is necessary in order to work with the typology.

Janosz and colleagues (1997) constructed the typology in several stages. Firstly, association analyses was used to "dichotomize all scholl experience variables: school marks, grade retention, school commitment, involvement, sanctions, stress, misbehavior and truancy. The variables were divided on their median value or its nearest value. The initial sample was divided into two sub-samples by a splitting variable. Each sub-sample is divided by another splitting variable. The process continues until the groups become too small or no other variables can be considered splitting criteria. A variable becomes a splitting criterion because it is the one that shows the strongest relation (i.e., chi-square coefficient) with all other potential criteria" (Janosz et al, 1997). The results of the association analyses led to a five-group solution. Next cluster analysis technique was used to group school dropouts into different homogeneous groups according to the criterion variables. The final typology of four groups was based on three school axes: behavioral maladjustment, commitment and achievement.

4. Hypothesis

The main purpose of this study is to test the stability of the school dropout classification model proposed by Janosz and colleagues (1997). Firstly, the classification of subjects for Time 1 will be compared with that of Time 2 and the resulting subject stability over a six month period will be analysed. Secondly, the study will test whether the stability of the classification model is influenced by a subject's risk of dropping out of school. These two questions will be addressed using chi-square and logit loglinear analyses.

Hypothesis 1: Contends that the classification of all subjects in time 1 will be significantly associated to the classification of the subjects in time 2, indicating a good overall stability.

Hypothesis 2: Maintains that the stability of the typology will vary according to the level of risk of dropping out. More precisely, the relationship between the classification in time 1 and in time 2 will be moderated by the level of risk of dropping out. The classification will be stable for high-risk students but not for low-risk students.

METHOD

1. Subjects

The subjects for this longitudinal study are students from two Montreal Catholic Commission High Schools (CECM): École Eulalie-Durocher and École Accès. The mandates of both CECM high schools differ, while their overall intentions define and influence the operations and goals of each school. The demographic composition of both École Eulalie-Durocher and École Accès constitute a large proportion of high risk potential dropout students.

Student's admitted into École Eulalie-Durocher must be between the ages of sixteen and nineteen by September thirtieth of that school year. The school's academic year is divided into two sessions of four months each. The school strives to offer its students an enriched educational atmosphere which will allow them to obtain their high school leaving diploma (D.E.S). Students are encouraged to actively pursue their studies in order to graduate from École Eulalie-Durocher. In a report written in 1997 examining the academic profile of students attending École Eulalie-Durocher, Janosz reports that a large percentage of students exhibit school related difficulties. Difficulties include lack of motivation toward school related issues, poor academic skills, and persisting behavioural problems

The mandate of École Accès differs from that École Eulalie-Durocher in that its main goal is to return students back into regular (mainstream) high school. The aim of École Accès is to allow its students the opportunity to acquire necessarily tools to permit them to reintegrate back into a conventional high school after one year. Janosz (1997) in a report examining the academic and psychosocial adaptation profile of students at École Accès, reported that the overall student population displayed several predictive factors of high school dropout. The factors included: serious delinquent behaviour, low socioeconomic status, disadvantaged family profile (eg, ethnic background, divorced parents, etc) and a high association with delinquent peers.

N=269

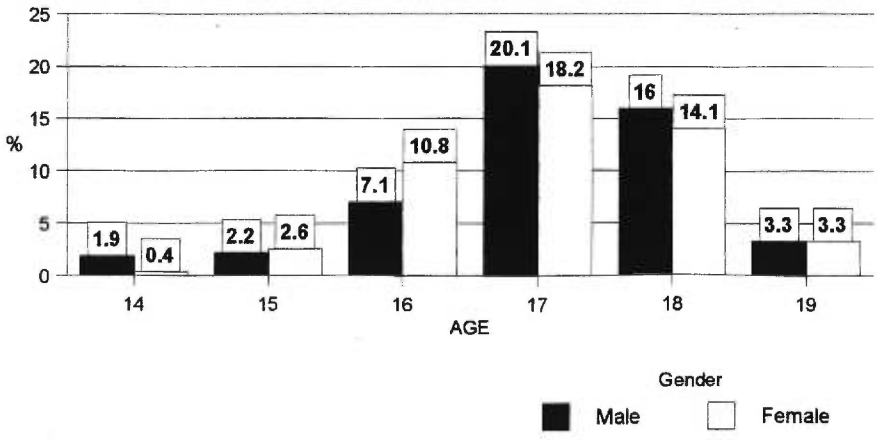

Figure 1. Percent distribution of subjects in both time 1 and time 2 according to their age and gender.

When both schools were combined for the purpose of the study there are a total of 269 subjects. The subjects range in age from 14 to 19 years old (the mean age of subjects from École Eulalie-Durocher and École Accès are 17 and 15 years old respectively). There is a slightly greater distribution of males than females in the sample distribution (136 males (50.6%), 133 females (49.4%)). Figure 1 displays the percent distribution of subjects according to their age and gender.

2. Procedure

Data was obtained through secondary analyse of a project of validation and action research. In November 1996 (Time 1), students from École Eulalie-Durocher and École Accès were administered during their respective class periods a self-reported measures paper-and-pencil questionnaire assessing their school experience. Students from École Accès were read the questionnaire by research assistants, whereas the students from Eulalie-Durocher were instructed to read the questionnaire on their own. In February 1997 (Time 2), the same questionnaire was readministered to the students at École Eulalie-Durocher and in March, 1997 (Time 2) the same questionnaire was distributed to the students at École Accès. The same administrative procedures were adhered to as in time 1. All efforts were taken to ensure that high ethical standards in respect

Table 2. Number of subjects in study from École Eulalie-Durocher and École Accès.

Schools	Subjects Time 1	Subjects Time 2			Subjects in both
		New	Old	total	Time1&2
Eulalie-Durocher	594	283	249	532	244
Accès	56	12	29	41	25
Total	650	295	278	573	269

to protecting the subjects from harm and assuring that the subjects participated willingly and were not coerced. The anonymity and confidentiality of the subjects filling out the questionnaire was assured. The information given subjects was held in the strictest of confidence.

Table 2 illustrates the number of subjects tested in time 1 and time 2 from both schools, and the number of students tested in both time intervals. The 269 students in the study are only those subjects who filled out the questionnaire in both time intervals. Of the 573 subjects in time 2, 295 (51.5%) are "new" subjects who did not fill out the questionnaire in time 1. The possibility of new subjects in time 2 exists because of newly enrolled students at both schools during the testing interval. At Eulalie-Durocher the testing interval encompassed the start of a new session in which new students registered in the school. At Accès several new students were admitted into the program, during the testing interval, replacing those students who had dropped out. Note that 9 subjects who filled out the questionnaire in both time 1 and time 2 were eliminated from the study because they did not fill out the questionnaire properly in time 2. Data was missing from their questionnaire, which prohibited the analyses from being performed. Therefore, the total number of subjects in the study is 269, corresponding to 41.4% of the initial 650 students in time 1.

2.1 Subject attrition

Closer examination of the subject pool in time 1 reveals that 186 subjects or 28.6% of the total sample in time 1 had dropped out of school prior to the second administration of the questionnaire. The majority of subjects who dropped out where between the ages of 17 and 18 years old (76.3%), with males comprising 56.4 % and females making up the remaining 43.7%. Finally, the same amount of subjects, 186 or 28.6 %, of the initial sample in time 1 were officially enrolled in school but were

missing on the day the questionnaire was administered in time 2.

In the discussion section a thorough review of the potential problems related to the subject attrition and the effects it may have had on the validity of the results obtained is undertaken. Reasons for the high level of subject attrition are given, as well as possible explanations for the attrition as it relates to the dropout classification model. Refer to Appendix 1 for both an analyse of the distribution of dropout subjects according to their classification status in time 1 and their risk score, as well as a brief comparison of subjects in time 1 who dropped out of school to those who remained in school on various sociodemographic characteristics.

3. Measures

The questionnaire which contained scales from the *MASPAQ (mesures de l'adaptation sociale et personnelle pour les adolescents québécois)* (Le Blanc, 1996) and other questions, allowed for the accumulation of information on specific school-related variables needed to construct the classification model. Derived directly from the MASPAQ, thirteen items were used in the construction of the dropout classification model. The MASPAQ, is an evaluation tool which allows for the measurement of the social adaptation of adolescents in Quebec. Through self reported measures it assesses the presence or risk of delinquent behaviour. The thirteen items were organized into four specific scales, consisting either of a four or five-point scale[1].

The *School Achievement Scale* was comprised of two questions which assessed the subject's academic achievement in school. The two questions asked dealt with the subject's average over the course of the semester in both French and in Math.

The *School Problem Behaviour Scale* was comprised of six questions (α=0.78) which assessed the subject's maladjusted behaviour in school. Questions within this group included: Have you ever responded to one of your teachers in an impolite manner?; Have you ever disturbed your class on purpose?; Have you ever skipped a class while you were in school?; Have you ever used hidden notes or other means in order to cheat?.

The *Commitment Towards Schooling Scale* was comprised of four questions (α=0.58) which

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[1] Refer to appendix 2 for a list of the thirteen questions comprising the four scales as administered to the subjects.

assessed the subject's commitment level towards school. Questions within this group included: Do you like school?; How important is it for you to obtain good grades?.

Finally, the *Grade Retention Scale* was comprised of one question which assessed whether the subject had ever repeated an academic school year. The question consisted of: Have you previously repeated a school year?.

Criteria for subject inclusion into one of the four dropout groups were based on their scores in the specific areas mentioned above. Subjects scoring high on the commitment scale (above a score of twelve) and low on the problem behaviour scale (below or equal to a score three) were assigned to the Quiet group. Subjects registering low commitment scores, average to high school achievement grades (65% or above), and low problem behaviour scores were classified in the Disengaged category. Subjects with low commitment scores, low school achievement scores (less than 65%), and low problem behaviour scores were placed in the Underachiever group. Finally, subjects with high problem behaviour scores (above a score of three) were assigned to the Maladjusted group. Many of the Maladjusted subjects had previously been held back one or more grades (grade retention score).

RESULTS

Table 3. Observed and Expected Frequencies for subjects at time 1 and time 2 (n=269)

	Typology of subjects in time 2				
Typology of subjects in time 1	Quiet	Disengaged	Low-achievers	Maladjusted	Total
Quiet	**87** (63.6)	28 (40.8)	8 (11.9)	16 (22.7)	39
Disengaged	15 (29.7)	**34** (19.1)	7 (5.6)	9 (10.6)	65
Low-Achievers	4 (8.2)	5 (5.3)	**7** (1.5)	2 (2.9)	18
Maladjusted	17 (21.5)	12 (13.8)	1 (4.0)	**17** (7.7)	47
Total	123	79	23	44	69

Note. Expected or theoretical cell frequencies are contained within parentheses

1. Stability

In order to answer the first part of the study's research question, the overall stability of the typology is examined by means of chi-square analyse and several measures of association. In addition, closer analyse of subject cross-classification is achieved through standardized residual examination.

Table 3 displays the observed and expected frequencies for the cross-tabulation of subject classification at time 1 and time 2. The numbers in bold correspond to the amount of subjects whose classification remain stable over time. The chi-square results reveal that there is a significant relationship between subject classification in time 1 and time 2 (χ^2=56.611, $p< 0.01$). The Cramer's V value for the contingency table 5 is 0.460, $p< 0.01$, indicating a fairly strong association between classification status in time 1 and time 2. The symmetric Lambda value for the above contingency table is .105 with T=1.956, $p< 0.05$. The significant Lambda score confirms that test classification in time 1 is related to classification in time 2. Knowledge of a subject's classification status at time 1 appreciably increases the accuracy of prediction of that subject's classification status in time 2. The Lambda score substantiated the results obtained by the Cramer's V statistic.

Table 4. Standardized residual scores for subjects at time 1 and time 2 (N=269)

	Dropout groups in time 2			
Dropout groups in time 1	Quiet	Disengaged	Low-achievers	Maladjusted
Quiet	**2.9**	-2.0	-1.1	-1.4
Disengaged	-2.7	**3.4**	0.6	-0.5
Low-Achievers	-1.5	-0.1	**4.4**	-0.6
Maladjusted	-1.0	-0.5	-1.5	**3.4**

Table 4 displays the standardized residuals for the time 1 by time 2 classification of dropout groups. Standardized residuals scores highlight the directionality and intensity of statistically significant associations in the contingency table, and help detect possible patterns in the data. Standardized residuals can be interpreted as z scores (Haberman, 1973; Kennedy, 1983; Kennedy, 1992). Looking in the z distribution table for $df = 9$ and $p = 0.05$ for a two-tailed test, we find a critical value of ±2.81. Thus, a z statistic that is more extreme than ±2.81 would be sufficient to reject the null hypothesis that subject classification in time 1 is independent to subject classification in time 2. The results show that within the contingency table only cells defined as the cross classification of the same dropout group in both time intervals displayed positive significant z scores. The significant departure from independence seen in these cells indicate a relationship between dropout group classification in time 1 and time 2. Subjects were more likely to be classified within the same dropout groups than would be expected under the null hypothesis.

2. Moderating effect of dropout risk on classification stability

To answer the second part of the study's research question, whether subject dropout risk acts as a moderating effect on the stability of the typology, identical statistic procedures as in the above section were followed.

Table 5. Classification distribution of subjects in time 1 and time 2 according to dropout risk.

	Time 1		Time 2	
Subject Classification	low risk	high risk	low risk	high risk
	%	%	%	%
Quiet	**71** (51)	**68** (49)	**70** (57)	**53** (43)
Disengaged	**29** (45)	**36** (55)	**28** (35)	**51** (65)
Low-Achievers	**1** (6)	**17** (94)	**1** (4)	**22** (96)
Maladjusted	**13** (28)	**34** (72)	**15** (34)	**29** (66)
Total	**114**	**155**	**114**	**155**

Table 5 indicates the number of subjects in each typology group for both time 1 and time 2 according to dropout risk (low or high). Similar patterns were observed in both time 1 and time 2. As a group, only the Quiet's displayed a greater percentage of subjects with a low dropout risk score. Contrarily, a greater number of subjects in all other dropout groups displayed a high dropout risk score. All subjects in the Low-Achievers group at both time intervals, except for one, scored in the high dropout risk level.

Table 6 displays both the observed and expected frequencies for the contingency table according to classification status in time 1 and time 2, and subject dropout risk. The numbers in bold correspond to the amount of subjects whose classification remain stable over time.

Table 6. Observed and Expected Frequencies for subjects at time 1 and time 2 according to subject dropout risk in time 1.

Dropout Probability	Typology of subjects in time 1	Typology of subjects in time 2				
		Quiet	Disengaged	Low-Achievers	Maladjusted	Total
Low	Quiet	**50** (43.6)	12 (17.4)	0 (0.6)	9 (9.3)	71
	Disengaged	13 (17.8)	**11** (7.1)	1 (0.3)	4 (3.8)	29
	Low-Achievers	1 (0.6)	0 (0.2)	**0** (0.0)	0 (0.1)	1
	Maladjusted	6 (8.0)	5 (3.2)	0 (0.1)	**2** (1.7)	13
	Total	70	28	1	15	114
High	Quiet	**37** (23.3)	16 (22.4)	8 (9.7)	7 (12.7)	68
	Disengaged	2 (12.3)	**23** (11.8)	6 (5.1)	5 (6.7)	36
	Low-Achievers	3 (5.8)	5 (5.6)	**7** (2.4)	2 (3.2)	17
	Maladjusted	11 (11.6)	7 (11.2)	1 (4.8)	**15** (6.4)	34
	Total	53	51	22	29	155

Note. Expected or theoretical cell frequencies are contained within parentheses

The contingency table defined by low subject dropout risk has a likelihood ratio chi-square value of 11.217 (DF=9, n=114) $p< 0.264$, while the contingency table defined by a high subject dropout risk has a chi-square value of 59.252 (DF=9, n=155), $p<.01$. The chi-square test of independence is significant for the three-way table only in subjects with high dropout probability in time 2. The null hypothesis of independence is therefore rejected only in the table defined as subjects exhibiting a high dropout probability.

The contingency table defined by low subject dropout probability has a non significant Cramer's V value of 0.181 $p< 0.26$. The contingency table defined by a high subject dropout probability has a Cramer's V value of 0.358 $p< 0.01$, indicating an association between the three factors (i.e., Subject classification in time 1, Subject classification in time 2, and Subject dropout risk)

of moderate strength. The contingency table defined by low subject dropout probability has symmetric Lambda value of 0.011 with T=1.004, $p< 0.315$, while the contingency table defined by a high subject dropout probability has a symmetric Lambda value of 0.066 with T=3.230, $p< 0.001$. The Lambda scores confirm that test classification in time 1 is related to classification in time 2 only in subjects with high dropout probability. Knowledge of a subject's classification status at time 1 appreciably increases the accuracy of prediction of that subject's classification status in time 2 for subjects whose dropout probability score is in the range of the high category. The Lambda score substantiated the results obtained by the Phi coefficient.

Table 7 displays the standardized residuals scores for the time 1 by time 2 classification of dropout groups according to subject dropout probability in time 2. Z score analysis confirms greater classification stability in subjects with high dropout probability. Classification stability is related to subject dropout probability in time 2. Specifically, results show that within the contingency table for subjects registering a high dropout probability, all four cells defined as the cross classification of the same dropout group in both time intervals displayed z scores equal or above 2.81. In addition, the cell representing subjects classified as Disengaged in time 1 and Quiet in time 2 displayed a significant negative z score, indicating that less subjects fell in this cell than what as expected according to the null hypothesis. In the contingency table of subjects scoring low dropout probability no cell displayed a significant z score.

Table 7. Standardized residuals for subjects at time 1 and time 2 according to dropout probability scores in time 2.

Risk score range	Typology of subjects in time 1	Typology of subjects in time 2			
		Quiet	Disengaged	Low-Achievers	Maladjusted
Low	Quiet	1.0	-1.3	-0.8	-0.1
	Disengaged	-1.1	1.5	1.5	0.1
	Low-Achievers	0.5	-0.5	-0.1	-0.4
	Maladjusted	-0.7	1.0	-0.3	0.2
High	Quiet	**2.9**	-1.3	-0.5	-1.6
	Disengaged	**-2.9**	**3.2**	0.4	-0.7
	Low-Achievers	-1.2	-0.3	**3.0**	-0.7
	Maladjusted	-0.2	-1.3	-1.7	**3.4**

3. Predictive value of the typology in subject classification

To confirm the predictive value of the typology to classify subjects, Logit Loglinear analyses were used. The Logit Loglinear analysis procedure analyzes the relationship between dependent variables and independent variables, and is interested in predicting a dependent variable from a set of predictors. Dropout probability and subject classification were used as the independent variables, while subject classification in time 2 was the dependent variable. All three variables are categorical. The Logit procedure analysed the relationship between the dependent variable and the independent variables, and predicted subject classification in time 2 as a function of subject classification in time 1 and subject dropout risk. The utilization of log-linear analyse offers the advantage of employing all available information in regards to the data, while controlling for the variations not pertinent to the research focus.

Table 8. Likelihood-ratio chi-square (L^2), degrees of freedom, and significance level associated with each Logit model and with each component of the model for the analysis when Subject dropout risk is entered first.

	Residual			Component		
Model	L^2	(df)	p	L^2	(df)	p
null [T2]	66.1	(21)	1×10^{-6}			
Main effect [R1]	49.6	(18)	3×10^{-7}	1.0	(3)	>0.10
Main effect [T1]	12.4	(12)	**0.94**	52.7	(6)	**<0.001**
Interaction [R1×T1]	4.1	(9)	**0.64**	8.3	(3)	**<0.005**
Saturated [T2] [T2×T1] [T1×R1][T2×R1][R1×T1×T2]	0	(0)	1.00	5.0	(12)	>0.10

T1: Subject classification in time 1
T2: Subject classification in time 2
R1: Subject dropout risk

The Logit analysis consisted of : a 4 (subject classification in time 1) × 4 (subject classification in time 2) × 2 (subject dropout risk). Table 8 presents the results of this analysis. The left column indicates the results relative to the quality of adjustment of the model following the addition of each component. The right column presents the contribution of each component in improving the quality of adjustment of the model.

The high alpha level for the main effect of subject classification in time 1 in the residual column indicates a strong quality of adjustment by this term to the model. The significant alpha level in the component column indicates that subject classification appreciably adds to the prediction of subject classification in time 2. In addition, the significant alpha level for the interaction effect of subject

classification in time 1 and subject dropout risk with subject classification in time 2, indicates an adjustment by this term to the model. The interaction substantially influences the prediction value of subject classification in time 2.

Contrarily, both the main effect of dropout risk and the saturated model add little to the predictive value of the typology. The contribution of each of these component does not improve the quality of adjustment of the model. Entering the components in a different order *(i.e.* entering 'Subject classification in time 1' first) did not modify the results in a substantial manner.

DISCUSSION

1. Overview of results

In an attempt to validate the classification model proposed by Janosz and colleagues (1995) the goals of this study were to test the stability of the classification model, test the influence of subject dropout probability on the stability of the model, and finally, to investigate the predictive value of the typology.

1.1 Stability

The results obtained by the chi-square analysis support the overall stability of the classification model. A significant relationship was found to exist between subject initial and final classification status across all four classification groups. In addition, the results of the standardized residual procedure showed that all cells defined as the cross-classification of the same dropout group in both time intervals displayed positive significant Z scores. The significant departure from independence seen in these cells is indicative of a relationship between the subject classification in time 1 and time 2.

Although the studies results confirm the stability of the classification model, numerous subjects do change groups from time 1 to time 2 (over half of the subjects in the study). Therefore reasons explaining subject mobility should be explored. Focusing attention on the main characteristics of subjects in the different dropout groups can help in offering possible explanation to subject mobility. As an example let us focus on the instability of a large number of subjects classified initially in the Maladjusted group. Many subjects initially in the Maladjusted group have by the second testing period either dropped out of school or become member's of another group. A Maladjusted student tends to exhibit high levels of school misbehaviour, poor academic grades, and usually has a high probability of dropping out according to their risk score. Moreover, it is not surprising when a large percentage of students in this group decide to abandon school. Group stability is affected because of the high risk nature of its subjects. A hypothesis which attempts to explain the "backward" movement

of subjects in the Maladjusted groups to the other groups assumes that subjects in other groups show both lower academic risk and dropout probability. Because of their overtly disruptive behaviour and pronounced academic deficiencies, subjects in the Maladjusted group are presumably the students who are initially identified as requiring the most help. They are signalled out because their needs are the most identifiable. Their school misbehaviour acts as the catalyst in discerning their requisite for help. These students assumably receive more intense and frequent interventions by school professionals than students from other classification groups. Although high risk students from other groups might be in grave need of assistance, they might often be by-passed due to their less recognizable predicament. Therefore, by receiving often early and focused treatment, Maladjusted students are likely to move "backwards" into a classification group in which subjects show less probability of dropping out of school (eg, Quiet group). The hypothesis given for the observed trend is purely speculative and its validation requires further testing and study.

1.2 Moderating effect of dropout risk on classification stability

As mentioned, Janosz (1995) constructed his typology based on a sample of school dropouts, presumably academically weak students. Janosz suggests the utilisation of a criteria for classification inclusion sensitive to the characteristics of a dropout sample. Therefore, Janosz and colleagues (1997) recommend the separation of potential graduates and potential dropouts from the total sample and the classification of only the potential dropouts within the typology, when using the typology to classify actual students. Although not fully developed in previous research and open to potential methodological problems, Janosz's recommendations seem to imply a relationship between subject dropout risk and classification. The typology is seen to be more compatible and efficient in classifying subjects at greater risk of dropping out of school. Accordingly, it is conceivable that classification stability would not be as good for low risk students as it would be for high risk students.

The results obtained in this study align well with the presumption that use of the typology is

most efficient with subjects with higher risk of dropping out. When subject dropout probability is factored into the contingency table, the findings show a moderator effect of dropout risk on the stability of the classification. Students with a high probability of dropping out exhibit significant group stability, whereas subjects with low dropout probability show random group mobility. Classification stability is evident only for subject with a high risk of dropping out of school. Thus, stability is directly related to subject dropout probability.

Several reasons can be given to help explain why subjects at a greater risk of dropping out tend not to change classification groups as often as those with a lower risk. Firstly, a possible explanation lies in the assumption that for subjects with low dropout risk their determined dropout group may be falsely represented. Students with lower dropout probability may be in a state of "flux", constantly changing their academic profile and hence their group membership. At any one particular time their grades, motivation, and school behaviour may change, which would in turn affect which dropout group they would be classified in. This change in group classification would clearly affect stability. Let us illustrate our point with the use of an example of a student who is not at-risk of dropping out of school. Normally this student achieves good grades in school, displays a high commitment level towards his studies, and does not disturb his class. All characteristics which would classify this student in the Quiet group. However, on the day the questionnaire was administered this student received a low score on a test he had not studied for. The student was extremely discouraged and could hardly concentrate in class. He was reprimanded several times by his teacher for talking to his classmates. When filling out the questionnaire later during the day, the student indicated that he had on occasion disturbed his class and was not always motivated to study. The student's answers on the questionnaire reflect characteristics typical of a subject in the Disengaged category, rather than that of a subject in the Quiet group. Clearly, if the questionnaire was distributed on another day, the student's answers and subsequent group affiliation may have been different.

Building upon the same premise as above, if a student's risk of dropping out increases they

may become "fixed" in a particular academic or psychosocial state. For example, a student who has repeatedly experienced school failure, may continuously be disruptive in class or manifest other inappropriate conduct. Characteristics typical of a student in the Maladjusted group. This student, unable or unwilling to modify his behaviour, will continue to remain affixed within his predicament, unless they receive some form of help. Unfortunately, if none is offered, in time he may simply leave school. Another example, is of the students who are struggling academically. Without sustained school success their school related commitment level will wane and their desire to remain in school will diminish. Over time, they will enter a state of despondency. Such may be the case with students who are in the Disengaged or Underachiever groups. Without appropriate intervention they may remain in this state for a prolonged period of time and may eventually drop out of school.

Secondly, the virtual absence of subjects with low dropout risk scores in the Under-Achiever group presents a potential statistical problem. Whereas, overall stability is evident for subjects in the Low-Achiever group with a high dropout risk, because only one subject is classified within the Low-Achiever group with a low dropout risk, analyse of group stability is prohibited. Without more subjects classified in this group a true gage of group stability in the low dropout risk level is impossible. In addition, due to the low overall number of subjects classified as Low-Achievers in the high dropout risk (less than seven percent of the total sample) the stability results obtained are subject to error. The possibility exists that with an increase of subjects the stability results may be different.

Finally, an alternative reason to help explain the discrepancy between the classification stability for low and high risk subjects is offered by examining the subject attrition results of this study. The findings shown in appendix 1 indicate that the majority of dropouts were classified in either the Low-Achiever or Maladjusted groups with high dropout risk scores in time 1. The subject loss may have artificially inflated the classification stability of subjects in the high dropout risk score category. Subjects who dropped out of school during the testing interval are not considered in the study, and this "lack of stability" is not factored into the assessment of classification stability. Therefore, on the

surface it may appear that subjects with high risk scores in the Low-Achiever or Maladjusted tend to remain in the same group over time. However, this observation may be biased by the fact that a large majority of subjects in both those groups dropped out of the study and there classification mobility was not considered. If, hypothetically, they had not dropped out, undoubtedly the classification observed in the high risk category would not have been as stable.

1.3 Predictive value of the typology in subject classification

When both subject classification in time 1 and subject dropout risk are placed in a prediction model of subject classification in time 2, Logit analysis reveals that almost all the variance in the dependent variable can be accounted for by subject classification in time 1. The variance in subject classification in time 2 that is predictable from variability in subject classification in time 1 is quite strong. Moreover, knowledge of subjects risk level adds little to the predictive value to the model. The variance in subject classification in time 2 that is predictable from variability in subject risk score is extremely weak. It appears that all prediction variance has been taken up by subject classification in time 1 and that Subject dropout risk as far as predictive value does not add anything new to the model.

The results also reveal that a smaller, but significant, part of the variance in the dependent variable can be accounted for by the interaction effects of all three variables in the model. The result indicate an interaction effect between subject classification and dropout risk. These results confirm the findings shown in the standardized residual analyse. Knowledge of the interaction effect appreciably increases the predictive value of the typology. Subjects at high dropout risk have a greater group stability than do subjects at low dropout risk. Consequently, they have a stronger propensity to remain in the same classification group over time than subjects at low dropout risk. The predictive ability of the typology is subject to the dropout risk level variable. The typology predicts group classification over time with greater accuracy in cases where subjects have a greater probability

of dropping out of school. Finally, the results validate Janosz and colleagues (1997) assumption that the typology should be used to classify subjects at-risk of abandoning school. Based on the findings of the standardize residual and Logit analysis, the typology appears to function as a classification instrument that is best used with students who have been assessed (using the screening method discussed) for high school dropout probability. The findings confirm the neccessity, as outlined by Janosz and collegues (1997), of using a sequential approach to classifying subjects within the typology.

2. Clinical implications of results

Janosz et al (1997) discuss the virtues of developing differential prevention and intervention approaches based on the different subject characteristics of the dropout groups. The results of the study confirming the stability of the typology supports the internal validity of this differential clinical strategy. Furthermore, this strategy seems valid only for students at a high risk of dropping out, as confirmed by the moderator effect of subject dropout risk. Development of differential approaches for students at high risk of dropping out is worthwhile because of their demonstrated tendency to remain in the same typology group over time. Therefore, the recommendations brought forth by Janosz et al (1997) to first screen for potential at-risk students and then to classify them, seems much more adequate than a classification of all students regardless of dropout risk level.

As discussed and demonstrated in the study students at risk of dropping out of school have dissimilar characteristics and drop out for different reasons, thereforee precipitating a need for differential programs which would respond to their individual circumstances. Identification of student characteristics provides the foundation and framework in which to mould prevention and intervention efforts. It serves to identify the kinds of preventions and interventions that could be most effective in helping potential and actual dropouts. The typology should be used as a guide in the development of dropout related programs. Programs developed should be sensitive to the theoretical foundation

of the typology, and address the particular needs of students who encompass the four dropout groups. Being aware of the characteristic makeup of at-risk subjects in the various typology groups can greatly assist in the planning and implementation of comprehensive dropout prevention strategies that accommodates students with different needs. Typology classification can also serve to identify the various academic related factors which may have caused a student to drop out of school, and subsequently help in the development of an effective reintegration program.

Effective prevention programs could be instituted based on subject classification within the model. Prevention programs are designed to interrupt or modify academic, school, or personal problems that are negatively affecting a student's performance. Dropout prevention takes on various forms and in most cases is an interdisciplinary approach. Prevention includes approaches that anticipate, forestall, or deal with cognitive, social or personal problems before they irreparably impair a student's ability to perform. To help more students stay in school and reach high academic standards, schools must offer a range of choices among learning experiences and prevention strategies that are engaging and meaningful to students. No one structure or set of activities works for all students (Hahn, 1987). A variety of strategies, student centred, should be used to address the entire range of student needs or factors that alienate them from school. By identifying the classification group of high risk students within the typology, and hence the specific areas of student difficulties, work to improve the academic experiences of students can progress in a concentrated and productive manner. In agreement with the classification status of students and the particular academic needs, the appropriate type of curriculum, teaching staff, instructional progress, schedule and location, and auxiliary services can be put into place to help students at-risk of dropping out of school.

In consideration of the heterogeneity of an at-risk student population, various differential prevention methods could be used for different potential dropouts depending on which typology group they fall into. For example, focusing on the difficult school behaviour of students classified in the Maladjusted group through a mentorship program, intensive counselling, or increased involvement

on the part of their parents, would be of greater benefit than if the same area was targeted with students who fall in the Quiet category. Students in the Quiet group rarely demonstrate any school misbehaviour, thus spending time on issues such a conflict resolution and anger management techniques with these students would most likely be a waste of time. Conversely, efforts to improve the social skills, self-esteem, and confidence level of students in the Quiet category through individualized counselling or support groups, would likely be quite beneficial. In addition, engaging to improve the school-related commitment level, intellectual strengths, or pedagogical strategies of students in either the Disengaged or Low-Achievers groups through concentrated remediation using individualized instruction, tutoring, competency-based curricula, improved school incentives, or school-to-work programs, would be both energy and resources well spent.

Finally, the classification instrument can be of immediate use to educators and policy makers in helping to identify potential dropouts at an accurate and timely identification, when effective preventions could be designed and implemented. Timely identification of students who are likely to drop out of school is crucial if dropout prevention programs are to be successful. The earlier a student with a high risk of dropping out is identified the more likely it is that sustained effort at dropout prevention will be useful.

3. Potential sources of error

To reiterate, the results of the study were compiled from a secondary analyse of the data. The lack of control over certain aspects of the study accounts for some of the methodological flaws of the research. The following are specific areas of concern and how those potential sources of error have been addressed in the present study.

3.1 Subject attrition

High levels of subject attrition or non-compliance in any study may lead to the sample of

subjects becoming systematically biased (Breakwell et al, 1995). It is when the attrition is due or at least could be due, to a systematic factor that both internal validity and reliability are threatened (Gold, 1984). When attrition occurs in a random fashion and effects all experimental conditions equally, than the study can proceed confidently that subject attrition has not biased the results obtained. However, when the rate of attrition differs across the experimental conditions (differential attrition) the potential for error exists. Attrition represents the potential of a serious biasing of the sample which may affect the generalisation of the findings which are obtained (Breakwell et al, 1995). The interpretation of the obtained classification distribution requires an awareness of the potential difficulties subject attrition may cause in the analyse of results. By explaining the loss of subjects and the potential impact on the results of the study, analysis and interpretation of the data can proceed confidently.

This loss of subjects between testing intervals can be explained several ways. Firstly, a large percentage of subjects are documented to have dropped out of school. Considering both the high academic and psychosocial risk of the student body these results are not surprising. Secondly, because the time frame between passing of the questionnaires encompassed the end of a semester (i.e., end of December), many students who completed the questionnaire in time 1 graduated school or transferred to another institution. Furthermore, numerous students were absent the day of the questionnaire was passed out and several refrained from filling out the questionnaire for personal reasons. In addition, some subjects were lost because of missing information on their questionnaire which was omitted either accidentally or intentionally. Because of missing values, these cases were rejected when computing the classification make-up.

The approximately six month time interval between administration of the questionnaires could have produced an affect on subject stability. Intervening events during this time period may have occurred to change subject's scores on the measures and hence lower reliability of the classification model. These events may include difficulties in school, problems at home, social or personal issues. In addition, taking into account the mandate of both schools to focus attention on improving the

academic life of their students, it is highly probable that some sort of intervention program may have come into contact with subjects over the testing interval. This could have influenced the stability of the classification model, in that students receiving academic help between the course of the six month testing interval might have changed their academic standing and changed their attitude towards different school and parental factors. This change in attitude may have necessitated a change in group classification. More specifically, students who are at a low dropout risk level may be more inclined to be influenced by academic or social interventions. Change in group stability would thereforee not be due to the unreliability of the classification instrument, but rather to an actual change in the attitudes of subjects.

Ideally, it is the role of the researcher to optimize the delay between the two administrations to offset an artificially inflated classification stability due to subject recall or a spuriously low effect due to the change in the make-up of the subjects, if the testing interval is too short or too long respectively. The nature of the study requires a specific amount of time to elapse before the subjects are retested. In order to get a greater sense of subject stability and how it corresponds to school experiences in further studies it may be appropriate to test subjects in accordance with school events. For example, to test subjects at the beginning of the school year, and then again once their first term grades are available, then again upon availability of their second term grades and finally at the end of the school year. This mode of testing would diminish the time interval between administrations of subject questionnaires, and allow for an examination of the link between group stability and school related experiences.

As mentioned, the results shown in appendix 1 indicate that the majority of dropouts were classified in either the Low-Achiever or Maladjusted groups with high dropout risk scores in time 1 (both scoring averages above the fifty percent divide). The higher percentage of students from the Low-Achiever and Maladjusted groups who dropped out during the testing interval, supports the view that subjects classified in those two groups are at a higher risk of abandoning school (Janosz et al,

1997). The results confirm that the loss of subjects was a process in accordance with the underlying principles of the classification model. The fact that the majority of dropout subjects where initially classified as either Maladjusted or Low-Achievers, correlates well with the theoretical basis of the model. According to the characteristics associated with subjects from each dropout group, both the Low-Achiever and the Maladjusted members are considered at a higher risk of dropping out of school than those subjects from the Quiet or Disengaged groups (Janosz, 1995). Both their psychosocial and academic experiences put them at a greater risk. In addition, the results confirm previous inferences (Janosz et al, 1997) that a larger majority of dropout subjects possessing high dropout risk score's are classified within the Low-Achievers or Maladjusted groups. Thereforee, the subject attrition can be seen as serving to validate the classification model and supporting the predictive validity of the classification model.

3.2 Expected contingency cells of less than five subjects

Another potential problem encountered with the data is the prevalence of cells within the contingency tables with an expected frequency count of less than five. The distribution of chi-square used in determining critical significance values is a continuous theoretical frequency curve. Because the sampling distribution of chi-square may change as the expected frequencies drop below five, it is generally agreed upon that the expected frequency should not be smaller than five (Christensen, 1986). Where the expected frequencies are small, the actual sampling distribution of chi-square may exhibit marked discontinuity. The continuous curve may provide a poor fit to the data, and appreciable error may occur in the estimation of probabilities, these being areas under the continuous chi-square curve (Christensen, 1986).

However, in the present study because the chi-square is computed from a contingency table with more than four cells and only a few of the expected frequencies are less than five, the effect on the sampling distribution is rather small (Breakwell et al, 1995). In addition, as is the case with this

study, with two or more degrees of freedom the error introduced by small expected frequencies is of less consequence than with one degree of freedom (Gold, 1984). According to Breakwell and colleagues (1995) contingency tables with two or more degrees of freedom an expectation of not less than two in each cell will permit the estimation of roughly approximate probabilities.

Finally, in follow-up studies it may be possible without serious distortion of the data to combine rows and columns of the contingency tables to increase the expected cell frequencies. Combining categories (dropout groups) would not only allow for an elimination of small expected frequencies, but would permit other analyses from being performed and other specific questions to be explored.

CONCLUSION

1. Concluding Remarks

Dropping out of school is a complex and multifaceted social problem for which there is no simple solution (Hargrove, 1987). Dropping out of school is a deeply rooted phenomenon which requires a complex array of solutions. There is no one magical, quick fix solution to the dropout problem. Focusing attention on fixing one part of the problem calls attention to the need for solutions to many other parts as well. The interrelated causes and multiple problems associated with dropping out call for comprehensive community wide, multi-service approaches and multi-component programs. In order for the problem to be effectively addressed it requires a concerted and cooperative efforts by educators, policy makers, and educational researchers can improve our understanding of the problem and help reduce its incidence. Early and successful identification of high-risk students provides more time to intervene and address their needs at a young age. Completing a high school education is a crucial element in the realization of a productive and rewarding life.

The results of classification model are pertinent to general statements about the school dropout processes and in further exploration of the school dropout phenomenon. Based in part on the exploratory nature of the research, the study acts as an important vehicle for further exploration of the classification model proposed by Janosz and colleagues (1995). Subsequently, the typology can be refined to become a powerful tool in the effort to predict and classify potential dropout students. It is envisioned that the classification model will become an instrument used to identify and appropriately treat at risk students.

The study's findings support efforts for continued development of a theoretical understanding of subject dropout based on the heterogeneity of the dropout sample with the use of the present classification instrument. Implications of the results necessitate a better comprehension of the dropout population based on the classification types of the subjects. The study's findings offer a rational for continued efforts in the development of a more thorough and refined picture of the student composition within each typology group. The classification stability in of itself provides evidence

supporting the heterogeneity of the dropout population. It lends credence to the viability and existence of the four dropout groups.

Further research is needed to confirm whether student classification could be conceptualized as a scale in which students are at different levels of dropout risk depending on which group they fall into. The notion of the different dropout groups as continuum of better to worse needs to be explored. It may be conceivable that in the act of dropping out, subjects pass through the different groups. A study which would test subjects at several specific time intervals is needed.

This study supports the need for the development of a comprehensive model of dropout behaviour that addresses the notion that there exists different types of dropouts who leave school for different reasons. These differences should be explored further and used to develop separate models of dropping out for different types of students. The research should strive to develop and advance theoretical concepts that treat school completion, grade retention, and school dropout, as consequences of a dynamic interaction of such variables as student characteristics, school context, occupational prospects, and cultural influences, and that represent dropouts as students who are part of a social world and who interact with the people and institutions that surround them. Such theories offer a rationale for dropout programs based on the motivating properties of students' lives and for future research.

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APPENDIX 1

Subject attrition

APPENDIX 1

SUBJECT ATTRITION

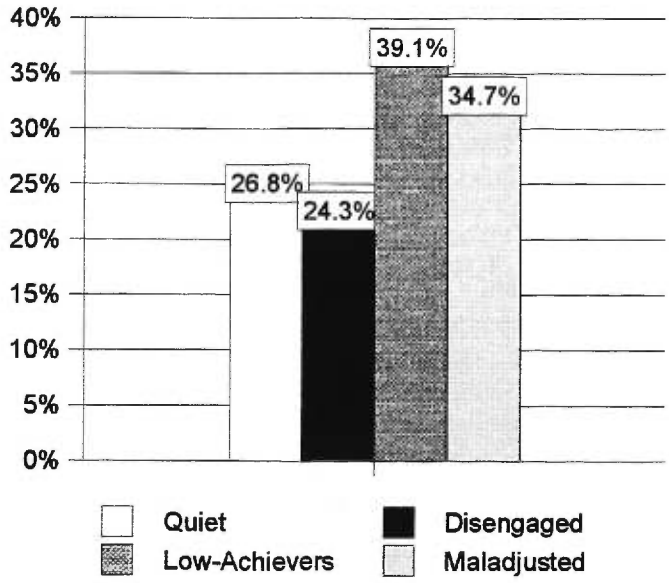

Figure 2. Percent distribution of subject dropout according to classification status in time 1

A closer examination of subject lose according to classification status reveals that a greater percentage of subjects who dropped out were originally classified in either the Low-Achievers or Maladjusted group in time 1. Approximately forty percent of subjects classified as Low-Achievers and close to thirty-five percent of those classified as Maladjusted in time 1 dropped out of school before the second administration of the questionnaire. Figure 2 presents the percent distribution of subject dropout according to classification status in time 1.

Another interesting finding relates to the subject dropout risk score for those students who dropped out. Although the average dropout risk score for students who dropped out of the study is quite similar to those students who remain in the study, 47.3 % compared to 52.4%, the average dropout risk score for dropout subjects according to their classification in time 1 is statistically different. Results of a one-way Anova reveal a difference between the mean dropout risk scores for both non-dropout subjects ($F=19.97$, $DF=3$, $p> 0.01$) and dropout subjects ($F=24.23$, $DF=3$, $p> 0.01$)

Table 9. Mean dropout risk scores for Non-Dropouts and Dropouts in the study

	Dropout Risk	
Dropout group	Non-Dropout	Dropout
Quiet	0.4388	0.3518
Disengaged	0.5335	0.4555
Low-Achievers	0.8984	0.8701
Maladjusted	0.6207	0.5862

according to group classification in time 1. A post hoc Scheffé test indicates that the subject dropout risk score for non-dropout subjects classified as Low-Achievers was significantly higher than for dropout subjects in any of the other three groups. In additions, findings show that subjects in the Maladjusted group scored higher in dropout risk than those subjects in the Quiet category, while the dropout risk scores of the Disengaged and Maladjusted subjects were not statistically different. A post hoc Scheffé test also finds that the subject dropout risk score for dropout subjects classified as Low-Achievers in time 1 was significantly higher than for dropout subjects in any of the other three groups. Results also indicate that the dropout probability for dropout subjects classified in the Maladjusted group in time 1 scored significantly higher on their dropout probability score than dropout subjects classified in the Quiet group in time 1. Finally, the average dropout risk scores per dropout category for both non dropout and dropout subjects were not significantly different. Table 9 shows the mean dropout risk scores of non-dropout and dropouts subjects according to their classification in time 1.

When compared on several sociodemographic factors, subjects who dropped out of school were not significantly different than subjects who remained in school. For example, 55% of subjects who abandoned school where male, while 56% of subjects who stayed in school were male. Chisquare analysis reveals $X^2 = 0.021$, $p = 0.885$. Furthermore, the mean age of subjects who left school was practically identical to the subjects who remained in school (17.35 and 17.14 respectively).

Finally, no significant differences are observed between dropouts and students remaining in

school on family related factors as measured by three scales derived directly from the MASPAQ (Le Blanc, 1996). On the *Family Disadvantage Scale* (which measures diverse structural disadvantage type variables and assesses the respondents family background, Anova results find $F = 0.972$, $p = 0.325$. On the *Parental Academic Support Scale* which measures parental support and commitment concerning school related issues, Anova results find $F = 1.323$, $p = 0.307$. Finally, on the *Parental Academic Value Scale* which assesses the importance parents place in education and the academic achievements of their children, Anova results reveal $F = 1.752$, $p = 0.274$.

APPENDIX 2

Questions used in the construction of the typology

APPENDIX 2

QUESTIONS USED IN THE CONSTRUCTION OF THE TYPOLOGY

A. School Achievement Scale

1. **Au cours de cette année scolaire**, quelles sont tes notes moyennes en francais ?

2. **Au cours de cette année scolaire**, quelles sont tes notes moyennes en mathématiques ?

90 % et plus	entre 80 et 89%	entre 70 et 79%	entre 60 et 69%	moins de 60%
A	B	C	D	E

B. School Problem Behaviour Scale

1. As-tu **déjà** répondu à un de tes professeurs en n'étant **pas poli** ?

2. As-tu **déjà** dérangé ta class **par exprès** ?

3. As-tu **déjà** manqué un cours pendant que tu étais à l'école ?

4. T'es-tu **déjà** servi de notes cachées ou d'autres moyens défendus **pour tricher** ?

5. As-tu **déjà** manqué l'école **sans une excuse valable** ?

6. T'est-il déjà arrivé de couler un cours au secondaire, mais sans avoir eu à recommencer (doubler) ton année ?

Jamais	Une ou deux fois	Plusieurs fois	Très souvent
A	B	C	D

C. Commitment Towards Schooling Scale

1. En pensant à tes notes, comment te classes-tu **par rapport aux autres** élèves de ton école qui ont ton âge ?

Je suis parmi les moins bons	Je suis en-dessous de la moyenne	Je suis dans la moyenne	Je suis au-dessus de la moyenne	Je suis parmi les meilleurs
A	B	C	D	E

APPENDIX 2

2. Aimes-tu l'école ?

Je n'aime pas du tout l'école	Je n'aime pas l'école	J'aime l'école	J'aime beaucoup l'école
A	B	C	D

3. Si cela dépendait que de toi, **jusqu'où aimerais-tu continuer** d'aller à l'école plus tard ?

Cela ne me fait rien, cela ne me dérange pas	Je ne veux pas terminer le secondaire	Je veux terminer le secondaire	Je veux terminer le CEGEP ou l'université
A	B	C	D

4. Jusqu'à quel point est-ce important pour toi d'avoir de bonnes notes ?

Pas important du tout	Assez important	Important	Très important
A	B	C	D

D. Grade Retention Scale

1. **Depuis ta première année au primaire**, as-tu déjà recommencé (doublé) une année ?

Jamais	Une fois	Deux fois	Quatre fois
A	B	C	D