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**The Psychology of School Leaving:
Motivation, Sense-of-Self, Values and Aspirations**

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Background. Identifying the reasons for school leaving remains a critical issue for educational researchers and practitioners. Many studies have investigated sociological variables implicated in school leaving. Very few studies, however, have explored psychological variables that may be implicated in school leaving. This study addresses this perceived deficit in the literature.

Aim. The aim of this study was to identify key psychological variables implicated in students' decisions to stay at, or leave, school.

Sample. 590 secondary school students (298 females and 292 males) attending five schools in the Sydney metropolitan region.

Methods. The participants were surveyed to determine the quantity (or level) and quality (or orientation) of their academic motivation, sense-of-self, and their values and aspirations. These variables were then used, in a series of Discriminant Analyses, to discriminate between school 'stayers' and school 'leavers'.

Results. Results of the study indicate that a limited range of variables (which included students' overall motivation, their general self-concept, their aspirations to further education, and the value they placed on their schooling) correctly discriminated between approximately seventy percent (70%) of school leavers and stayers in the study.

Conclusions. Relevant psychological variables may be used to correctly classify school leaver and school stayers. Hence, these variables ought not to be ignored in studies and interventions concerned with school leaving.

Early school leaving has remained a key concern of educators, policymakers, and the public in general. An indication of the magnitude of this concern is the extent of the literature generated in response to it (e.g. Ainley & Allen, 1997; Ainley & Sheret, 1992; Barrington & Hendricks, 1989; Brodinsky & Keough, 1989; Finn, 1989; Hernandez, 1995; McCormick, 1989; McMillen, Kaufman, & Whitener, 1994). One reason for this concern is the uneven pattern of 'dropping out' behaviour. For example, dropout rates remain high in certain areas, particularly major cities, and among certain populations, particularly minority populations (Barber & McClellan, 1987; Carter & Wilson, 1997; Ekstrom, Goertz, Pollack, & Rock, 1987; Frase, 1989). Another reason for concern is the potentially serious consequences of dropping out, which include substantially reduced income earning potential, increased likelihood of imprisonment, and increased divorce rates among early school leavers (Boss, Edwards, & Pitman, 1995; Coley, 1995).

Predicting Early School Leaving

Despite the above, identifying the factors implicated in early school leaving remains problematic, and there is still very little consensus in the literature as to the key variables which may 'cause' early school leaving (Coley, 1995; Fernandez & Shu, 1988; Finn, 1989; Reyes, Gillock, & Kabus, 1994). One reason for this is that although a number of factors are correlated with early school leaving, this does not mean that these factors cause individuals to leave school early (Finn, 1989). In addition, the interaction of multiple, complex variables makes it difficult to determine which variables are most significant in predicting school leaving and retention (Rumberger, 1987; Steinberg, 1996). Moreover, it is also the case that different early school leaving risk factors may be more, or less, important than others in

different communities (and sub-communities). Even within the same area, school, or class, for example, students leave school for different reasons (Greenberger & Steinberg, 1986; Mann, 1989). Finally, much school leaving is, apparently, unexplained. For example, one study found that the majority of students with any particular risk factor did not drop out, and the majority of drop-outs were not represented in any identified at-risk groups (Frase, 1989).

As a result, predictive models of school leaving are notoriously inaccurate (LeCompte & Goebel, 1987; Parsons, Saye, and McNamara 1990). This situation is compounded by the fact that school leaving statistics are often inaccurate, and mis-attribution of school leaving (e.g. recording as school leavers those who have simply moved to other schools) is common (LeCompte & Goebel, 1987). Also, it needs to be recognised that what constitutes “accurate” in terms of models of school leaving is not definitively addressed in the literature. However, we suggest that at the very least models of school leaving should (a) be demonstrably more accurate than chance, and (b) be tested against competing models. In this study we test the models of school leaving proposed against a ‘chance model’ and against internally competing (nested) models.

Theories of School Leaving

Whilst reasons and explanations for early school leaving remain problematic, some dimensions of early school leaving appear to be fairly well established in the literature. First, variables at many levels appear to influence, or at least to be associated with, early school leaving (Coley, 1995; Ekstrom, Goertz, Pollack, & Rock, 1987; Finn, 1989; Glennie & Stearns, 2002). Thus, individual-level variables (e.g. poor grades or not liking school, see Ekstrom, et al., 1987), family-level variables (e.g. the need to financially support family members, see Greenberger & Steinberg, 1986), school-level variables (e.g. school organisational structures and curriculum alternatives, see Hamby, 1989; Hernandez, 1995; Sziro, 2001), community-level variables (e.g. the wider acceptability, or not, of dropping-out, see Parsons, Saye & McNamara, 1990; Tinto, 2000) and cultural-level variables (e.g. culture-related attitudes to learning and schooling, see Nurmi, Poole, & Seginer, 1995; McInerney & Dowson, 2003) have all been implicated in school leaving.

In addition to the above, individual-level variables affecting school leaving may be divided into demographic variables (e.g. the age, sex, race, or socio-economic status of an individual) or psychological variables (e.g. an individual’s attitudes to, or belief about, school or their perceptions of self). One key difference between these two types of individual variables is that the former are either relatively or absolutely unchangeable, whereas psychological variables such as attitudes, beliefs and perceptions may be influenced by significant others (such as parents, peers and teachers) (Maehr & Anderman, 1993). This opens the possibility of effective interventions based on an understanding of psychological variables which may effect school leaving.

Second, the relative salience of these variables with respect to school leaving is context-sensitive i.e. in any given context individual variables (or sets of variables) at a given level (or levels) may be more important than other variables in students’ decisions to leave school (Alwin & Otto, 1977; Glennie & Stearns, 2002; Nurmi, Poole & Kalakoski, 1994).

Third, psychological (Nurmi, et al., 1995, Roeser, Midgley & Urdan, 1996) relational (Hernandez, 1995), organisational (Maehr & Anderman, 1993; Mann, 1989) sociological (Rumberger, 1987; Tinto, 2000), and socio-cultural (McInerney, 1992; Nurmi, et al., 1994) theories may all be at least partially effective in explaining why selected variables (sometimes taken at different levels e.g. Glennie & Stearns, 2002) may contribute to school leaving. Despite this, it is not clear that any one theory is obviously superior to others in explaining why students leave school early.

What is clearer is that given variables may act in different ways to influence school leaving. For example, Glennie and Stearns (2002) suggest that variables implicated in school leaving fall into three basic categories: ‘drop-out’, ‘push-out’ and ‘pull-out’ variables. Drop-out variables are usually assessed at the individual level. They include a range of variables

which are said to either directly undermine students' psychological commitment to school, or variables that make it difficult for students to function effectively in school, thus reducing their satisfaction in, and eventually their commitment to, school. Examples of drop-out variables include those associated with students' overall motivation towards school, their sense-of-self in school (e.g. their academic self-concept, self-efficacy or self-esteem, see Bong, 2001), and their values and aspirations (e.g. whether they see school as valuable in the present, and useful for fulfilling their future plans and desires (see Zaleski, 1994).

Push-out variables include variables, typically assessed at the school level, which make it difficult for student to continue in school. These include variables such as 'boring' or 'irrelevant' curricula, poor relationships with teachers, difficult school-work, and inability to negotiate school rules/boundaries. Pull-out variables, which are often assessed at the family, community or socio-cultural level, include variables which attract students away from school rather than 'push' them out of school. Variables of this type include family responsibilities, job opportunities, religious commitments, and perceived social roles.

Fifth, recommendations at different levels (i.e. individual interventions, family support, school improvement, community awareness, and social reform (see Szirom, Jaffe & MacKenzie, 2001) have all been proposed to counter-act early school leaving. Despite this, identifying students who may be at-risk and constructing appropriate and effective interventions for these students remains notoriously difficult (LeCompte & Goebel, 1997). Perhaps partly as a result, school drop-out rates remain high in many countries, and may even be increasing (Szirom et al., 2001).

The dimensions of the early school leaving literature discussed above may be summarised as follows (see Table 1).

Table 1
Dimensions of Early School Leaving

Variable Level	Nature of Explanation/Theory	Direction of Effect	Type of Intervention
Individual	Demographic Psychological	Drop-out	Individual Intervention
Family	Relational	Pull-out	Family Support
School	Organisational	Push-out	School Improvement
Community	Sociological	Pull-out	Community Awareness
Society	Socio-cultural	Pull-out	Social Reform

Directions for Research

Most of the literature on early school leaving appears to have focussed on individual-level demographic variables (e.g. Glennie & Stearns, 2002), or on school-level variables (such as changes to school curricula or organisational patterns e.g. Mann, 1989; and McCormick, 1989). This, alongside the fact that effective models of school leaving continue to remain elusive, suggest that investigations into the variables implicated in early school leaving may need to be expanded and/or redirected.

In the context of this study we suggest that an investigation into individual-level psychological variables may prove valuable for researchers and practitioners. We make this suggestion for several reasons. First, in many areas of functioning psychological variables have been shown to profoundly influence human behaviour (Bandura, 1997; Deci & Ryan, 1985; Mischel & Shoda, 1995). In the academic domain, examples of these variables include the level and quality of students' motivation (Barker, Dowson & McInerney, 2002; Pintrich, Marx & Boyle, 1993), perceptions of self, such as self-concept (Bachman & O'Malley, 1986; Marsh, 1993), and values and aspirations, such as valuing school and desiring to go on to further education or specific occupations (Bong, 2001; McInerney & Dowson, 2003). These variables have been shown to influence, or at least be associated with, important academic behaviours and outcomes from these behaviours. These behaviours and outcomes include

'deep' cognitive engagement in learning (Barker, et al., 2002; Dowson & McInerney, 2003), academic achievement (DeBaryshe, Patterson & Capabaldi, 1993; Marsh, 1990b), pro-social behaviour in school (Wentzel, 1991), post-school educational and occupational outcomes (Hagstroem & Gamberale, 1995) and early school leaving (Marks, 1998).

Second, as indicated above, unlike many individual-level demographic variables investigated to date, psychological variables can, at least potentially, be influenced by teachers, parents, and schools and communities as a whole. So, for example, supportive parents and teachers may improve students' motivation-for-school (McInerney & Dowson, 2003) and their academic self-concept (Hattie, 1992). The way teachers structure instruction may promote adaptive motivational orientations to learning (e.g. persistence in the face of difficulty or a willingness to try new learning strategies, see Ames, 1992 and Maehr & Anderman, 1993). Interesting and relevant curricula options may improve students' appreciation for the value and usefulness of school (Renninger, 2000). The implication in the above is that school leaving may be at least partly addressed through the manipulation of key psychological variables. However, which psychological variables may be of most significance in early school leaving is, at yet, largely indeterminate.

Related to the above, if a set of psychological variables can be shown to be associated with early school leaving, then interventions which address school leaving may usefully include reference to these variables. Conversely, some programs may have already included reference to certain psychological variables without necessarily having a firm empirical basis for these inclusions (e.g. Szirom, et al., 2001). Thus, empirical research into psychological variables associated with school leaving may provide a current, or even retrospective, basis for the development of effective school-leaving interventions.

The reasons stated above provided an overall justification for investigating psychological variables associated with school-leaving. This justification has not, however, dealt with the issue of specifically which psychological variables may be important for school leaving. Below we suggest that, based on the results of previous studies, it is possible to select a defined set of psychological variables potentially related to school leaving. These include variables relating to students' motivation, their perceptions of self (or sense-of-self), and their values and aspirations. The criteria for the selection of these variables are outlined first.

Criteria Guiding the Selection of Variables

Three criteria guided the selection of variables in this study. First, we were particularly interested in psychological variables that would potentially discriminate between school leavers and school stayers. This is because identification of early school leavers, especially 'before the fact', is still a major unresolved issue. For example, it is known that a greater percentage of students from minority groups leave school early than is the case with majority groups (Barber & McClellan, 1987). Despite this, many students from minority groups do not leave school early, and many from majority groups do. Thus, a search for more specific measures that may help identify potential early school leavers is both warranted and necessary – both for theoretical and practical (intervention-based) reasons.

Second, in searching for such discriminating variables, we started with psychological variables associated with early school leaving in previous theoretical or empirical school-leaving studies, but not explicitly investigated as discriminating variables. These variables included students' overall level of school motivation, their self-concept, the value students place on school, and their plans for future education and/or employment (Bong, 2001; Marks, 1998; Szirom et al., 2001). Thus, we hoped to extend the research on these variables by explicitly investigating their discriminatory power with respect to school leaving.

Third, we included some psychological variables not yet investigated as discriminating variables with respect to school leaving. These variables were chosen, however, because they have been associated in many studies with other important schooling outcomes such as engagement in learning, academic achievement and absenteeism (e.g. Ainley & Sheret, 1992; McInerney, et al., 1998; McInerney, Roche, McInerney, & Marsh,

1997). These outcomes, in turn, have been associated with school leaving (Barber & McClellan, 1987; Barrington & Hendricks, 1989; Frase, 1989). Examples of these variables included, particularly, students' motivational goal orientations, such as their mastery, performance and social motivations. In other words, we selected some psychological variables that, on a theoretical level at least, have been indirectly associated with school leaving. The point of the present investigation with respect to these variables, then, was to determine whether they may be directly associated with early school leaving.

In summary, we were interested in establishing the discriminatory power of psychological variables that have, either directly or indirectly, been associated with school leaving in previous studies. We cannot be sure (of course) that all relevant psychological variables of potential significance have been included in this study. Nevertheless, the variables in this study (described further below) represent a diverse range of potentially important variables, which may be expanded upon in future studies. With the above criteria in mind, we move to a description of the variables included in this study.

Global Academic Motivation

Students' global academic motivation may be defined as their self-perceptions of their desire to be involved in, apply effort towards, and persist with, their schooling and learning. It has often been assumed or directly hypothesised (e.g. Maehr & Midgley, 1996; Steinberg, 1996; Szirom et al., 2001) that students with high motivation are more likely to stay at school while students with low motivation are more likely to leave. However, we are aware of no studies in which global academic motivation has been included as a specifically measured independent variable in empirical studies of school leaving. In this study we include a specific measure of global academic motivation (described later). Consistent with previous literature we also hypothesise that global motivation will be a discriminating variable between school leavers and school stayers, with school leavers reporting significantly lower global motivation than school stayers.

Motivational Goal Orientations

Students' overall level of academic motivation may be distinguished from their motivational orientations towards learning. Following Dweck (1992), and Urdan and Maehr (1995), this paper uses the terms 'achievement motivation goals', 'motivational goals', or 'goal orientations' to refer to students' academic and social reasons (purposes) for achievement. These reasons are said to direct students in particular ways towards specific achievement outcomes. This definition differs from other conceptualisations of goals commonly found in the literature (e.g. Zimmerman, Bandura, & Martinez-Pons, 1992), where goals are equivalent to specific achievement outcomes.

What is of most importance for this study is the potential connection between students' motivational goals and students' potential for early school leaving. In this study we frame the general hypothesis that because motivational goals are associated with perceptions of academic success or failure (e.g. Ainley & Allen, 1997; McInerney, Roche, McInerney, & Marsh, 1997; Roeser, Midgley, & Urdan, 1996), and perceptions of success and failure are associated with school leaving (e.g. Brodinsky & Keough, 1989; Rumberger, 1987), motivational goals may discriminate between school leavers and school stayers.

Three particular motivational goals are investigated in this study: mastery goals, performance goals and social goals. Each of these goal orientations represents a particular purpose for achievement, and hence a particular criteria for success or failure i.e. success occurs when the particular purpose of a goal is fulfilled, and vice versa. A full description of these goals is not possible here, and many full-reviews are available elsewhere (e.g. Dowson & McInerney, 2003; Urdan & Maehr, 1995). However, briefly, the goals investigated in this study may be summarised as follows. Under a mastery goal, the purpose of striving for achievement is defined as the development of competence, and the criterion for success is whether competence has been improved or enhanced through involvement in achievement related activities (Blumenfeld 1992; Dowson & McInerney, 2001; Pintrich, Marx & Boyle,

1993; Renninger, 2000). Under a performance goal, the purpose of striving for achievement is defined as the establishment or demonstration of competitive superiority over others. The criterion for success is whether superiority has been established or demonstrated through involvement in achievement related activities (Barker, Dowson, & McInerney, 2002; Urdan, 1997). Finally, under social goals, the purpose of striving for achievement is defined as the demonstration of cooperation with others and others' desires, and the criteria for success is the extent to which others positively acknowledge and respond to demonstrations of cooperation (DeBaryshe, Patterson, & Capabaldi, 1993; Dowson & McInerney, 2001, 1997; Wentzel, 1991; Urdan & Maehr, 1995).

Although not widely researched, there appears to be at least some evidence (e.g. McInerney, Hinkley, Dowson, & Van Etten, 1998) indicating that mastery, and to a lesser extent, social goals lead to more positive and stable perceptions of success, while performance goals lead to less positive and stable perceptions of success. This makes some intuitive sense, because many, most or even all students in a given achievement-related context may be successful in terms of developing competence or showing cooperation with others over time. However, presumably only the most able students will be able to consistently demonstrate superior performance to others over time. Viewed another way, competitive comparisons may lead students more readily into perceptions of academic failure because performance-based comparisons generate a 'winners' and losers' frame of reference in which all but the most able 'lose' at least some of the time (Barker, et al., 2002).

Because mastery and social goals may lead to more positive and stable perceptions of success (and because perceptions of success are related to school retention) we hypothesise that school stayers will be more mastery and socially oriented than school leavers. Conversely, we hypothesise that early school leavers will be more performance oriented than school stayers, with the underlying assumption being that early school leaving is associated with the less positive and stable perceptions of success associated with performance goals.

It should be noted that recent research and theorising (e.g. Elliot, 1999, 1997; Elliot & McGregor, 2001; Urdan, 1997) has partitioned the performance goal into performance approach goals (goals directed towards the display of superiority in front of others), and performance avoidance goals (goals directed towards avoiding the display of inferiority in front of others). This research and theorising suggests that performance approach and mastery goals may act in a positive direction with respect to students' actual and perceived achievement behaviours, while performance avoidance goals may work in the opposite direction. Development of the performance goal measures used in this study preceded wider recognition of this recent theorising, and so do not include the performance approach/avoidance distinction. This is a limitation of the study, which may be addressed in future research.

Sense-of-Self

Whilst many variables may be said to influence one's sense-of-self, it is clear that self-held opinions and beliefs about the self are critical to overall academic success (Bachman & O'Malley, 1986; Bandura, 1997; Covington, 1992; Marsh, 1984; Stipek & Gralinski, 1996). To the extent that academic success is also related to school leaving there is, then, at least a possible relationship between sense-of-self and school retention or otherwise.

In this study we selected three particular sense-of-self variables: students' academic self-concept, their sense of purpose with respect to academic achievement, and their sense of self-reliance or autonomy (e.g. McInerney, Simpson & Dowson, 2003). In general, these variables were selected either because previous studies have (a) related these constructs to school leaving but have not explicitly investigated these constructs as discriminating variables between school leavers and stayers or (b) related these constructs to outcomes potentially associated with school leaving (such as academic engagement in school, perceptions of success, and absenteeism) but not to school leaving itself. Each of these sense-of-self variables, and hypotheses associated with them in this study, are described further below.

Self-Concept. A long history of educational research suggests that improvements in academic self-concept may lead to improved academic achievement and other desirable academic outcomes such as school completion (Craven, Marsh, & Debus, 1991; Hattie, 1992; Marsh, 1993, 1988; Skaalvik & Rankin, 1995). Specifically, recent self-concept research suggests that the attainment of a positive academic self-concept affects academic behaviours, academic choices, educational aspirations, as well as overall and domain specific academic achievement (Marsh, 1990a; Shalveson & Marsh, 1986). Furthermore, educational interventions that successfully produce short-term changes in academic skills, aptitudes or achievement are enhanced when these interventions also result in positive changes to students' self-concept (Marsh, 1990b, 1993; Marsh, Chessor, Craven, & Roche, 1995; Marsh, Craven & Debus, 1991). Given these findings, we hypothesised that self-concept may be a salient variable in discriminating between school leavers and stayers. More specifically, we hypothesised that school stayers would report higher self-concepts than school leavers.

Sense of Purpose. Students' sense of purpose for their schooling refers to their self-perceptions that schooling is a meaningful and worthwhile activity because it leads to some self-defined, valued outcome(s). Students' sense of purpose is related to their sense of self because their sense of purpose typically leads to feelings of control, direction and meaningfulness in academic settings. In doing so, students' sense-of-purpose creates an affective climate which promotes engagement in schooling and learning (McInerney, et al., 2003).

A student's sense of purpose may be either present- or future-referenced (Nurmi, Poole, & Seginer, 1995; Zaleski, 1994). For example, a present-referenced sense of purpose for schooling may be generated if present learning itself is deemed to be a worthwhile outcome of schooling. A future-referenced sense of purpose may be generated if schooling is perceived to lead to some future valued outcome, such as a place in university or a valued future occupation (Nurmi, et al., 1995; Nurmi, et al., 1994; Zaleski, 1994). Whether present- or future-referenced, because sense of purpose promotes engagement in schooling and learning, we hypothesise that students with a stronger sense-of-purpose are more likely to complete school than those who hold a weaker sense of purpose for their schooling. This hypothesis is consistent with previous studies (e.g. Nurmi, et al., 1995; Nurmi, et al., 1994), although these studies have not explicitly investigated sense-of-purpose as a discriminating variable between school leavers and stayers.

Self-Reliance. Brookover and Lezotte (1979), in their model of effective schools suggested that along with academic self-concept, maximising academic self-reliance should be a major goal of schooling. Such a focus has also been recognised by school systems and governmental bodies (e.g. Australian Educational Council, 1989). Academic self-reliance may be defined as a student's ability to undertake and complete academic work without the necessary intervention of others. Academic self-reliance is hypothesised to promote appropriate task choice, sustained academic effort, overall academic performance, and subsequent feelings of self-efficacy (Harter, 1985; Schunk, 1996; Zimmerman, et al., 1992). Because these effects are associated with school retention (e.g. Bong, 2001; Szirom, 2001), it is possible that self-reliance is also directly associated with school retention. Also, because the later years of secondary school require increasing degrees of self-reliance (e.g. McInerney et al., 2003) it is possible that students with higher self-reliance will adapt better to the cognitive and affective demands of these later years, and hence be more likely to stay at school. For these reasons, we hypothesise in this study that school stayers will report higher levels of self-reliance than school leavers.

Values and Aspirations

The intrinsic value students place on school and schooling, their positive or negative affect towards school, and their future educational and occupational aspirations may influence students' retention in school (e.g. Alwin & Otto; 1977; Bong, 2001; Hagstroem & Gamberale, 1995; Hernandez, 1995; Merten, 1997; Mischel & Shoda, 1995). Moreover, these variables may interact, even in apparently contradictory ways, to influence students' retention (or not).

For example, one study found that despite leaving school, eighty-five percent of dropouts planned to attain at least a high school education, one-third expected to attend college, eleven percent anticipated gaining a degree, and five percent expected to get a master's degree (Parsons, et al., 1990). Thus, defining linear relations between values and aspirations and school retention or otherwise may be problematic. Despite this, several studies (e.g. Marks, 1998; Rumberger, 1987; Sziron, 2001) suggest that school stayers will positively value school, report positive affect towards school, and have defined educational and occupational aspirations. For this reason, we hypothesise that the school stayers in this study will exhibit a similar pattern, and that these variables will discriminate between school leavers and school stayers.

Distinctions Between "Sense-of-Self" and "Values and Aspirations" Variables

Some of the Sense-of-Self (particularly Sense-of-Purpose) and Values and Aspirations variables described above are quite closely related, and so distinctions between them may require some further clarification. Sense-of-Purpose refers to the perceived future utility (extrinsic) value of schooling, as opposed to its present intrinsic value (as measured by the Value construct). This is a potentially important distinction because Sense-of-Purpose and Value may not necessarily act in the same direction. For example, a student may not think that school is intrinsically worthwhile, which may direct them towards leaving school. However, at the same time they may recognise that school will "get them somewhere" in the future, and so be prepared to stay at school despite their lowered evaluation of its present value.

Sense-of-Purpose is also distinguished from Further Education and Desired Occupation, which represent students' actual educational and occupational aspirations, as opposed to their perceptions that school may enable them to achieve these aspirations. Sense-of-Purpose and Value may also be distinguished from Positive Affect in that the former two variables refer to cognitive appraisals of school, whilst Positive Affect refers to student emotional/affective appraisals of school. This distinction is important because students' decisions to leave school are not always made for explicitly formulated cognitive reasons, but may be made for emotional/affective reasons at least partially below the level of conscious reflection (Szirom, 2001).

Finally, it should be noted that Sense-of-Purpose is closely aligned to other constructs formulated in the literature. These include perceived instrumentality (Zaleski, 1994) and future-oriented goals (Nurmi, et al, 1995, Nurmi, et al., 1994). We recognise that this plurality of terms is not necessarily helpful. However, we have deliberately chosen Sense-of-Purpose in this study because Sense-of-Purpose implies a sense of personal direction not necessarily implied by the other constructs. We hypothesise that this sense of personal direction is in fact a key to discriminating between school leavers and stayers, rather than a more personally removed appraisal of school as a useful institution. Also, Sense-of-Purpose has been used as the construct label (for the identical construct) in a long series of studies (e.g. McInerney, et al., 1998; McInerney, et al., 2003; McInerney & Sinclair, 1992). Thus, continuing to use the label links this study to previous research.

Summary

Variables implicated in early school leaving may be categorised by the level of the variable concerned, the nature of the explanation or theory associated with that variable, the hypothesised directional effect of the variable, and/or the type of intervention associated with the variable. The, as yet, partial success in explaining or predicting school leaving, and the partial success of school retention interventions, suggests that exploring new variables associated with school leaving, or assessing the discriminatory power of 'old' variables, may provide a positive way forward for both researchers and practitioners. For various reasons stated above, not least including the fact that these variables may be potentially manipulated by both researchers and practitioners, we have chosen to investigate the discriminatory power of several old and new individual-level psychological variables. These variables are described

and differentiated above, and specific hypotheses regarding group differences (i.e. leavers versus stayers) with respect to these variables are formulated.

Purpose

The psychological variables reviewed above do not represent the only variables (psychological or not) that may be implicated in school leaving. However, they do represent a justifiable initial selection of psychological variables that may discriminate between school leavers and stayers. The review above also indicates that some of these variables may interact with each other to influence school leaving behaviour. Thus, there is scope for examining not only which variables, but also which combinations of variables, may be most salient in distinguishing between school leavers and stayers.

The specific purpose of the present research, then, was to determine, of the psychological variables selected, those individual variables and combinations of variables that may differentiate between school leavers and stayers.

Method

Participants

Five-hundred and ninety (590) Year 10 secondary school students participated in the study. In Australia, students may leave school at the end of Year 9. However, students who complete Year 10 are eligible for a school-leaving Certificate. Thus, the end of Year 10 represents the first exit point from high school at which a formal qualification may be obtained. For this reason, most students intending on leaving school before Year 12 (the completion of secondary schooling in Australia) do so at the end of Year 10.

These students were drawn from five (5) secondary schools in the south-western region of Sydney, Australia. The schools were chosen to participate in the research because of their relatively high drop-out rates in comparison with schools in other areas of Sydney. The number of participants from each school varied somewhat, with the lowest number of participants from an individual school being seventy-five (75), and the highest number being one-hundred and eighty-seven (187).

The mean age of the sample was 15.5 years, with the majority of participants being either 15 years ($n = 306$) or sixteen years ($n = 275$) years old. Of the total sample, two-hundred and ninety-eight (50.5%) were females and two-hundred and ninety two (49.5%) were males. A wide variety of cultural groups were represented in the sample. However, most of the participants ($n = 347$, 58.8%) came from Anglo-Australian cultural backgrounds. Other significant cultural groups represented in the sample included Italians ($n = 25$, 4.2%) and Aboriginal-Australians ($n = 23$, 3.9%).

One-hundred and eighty students (180, 30.5%) from the total sample left school after completion of the surveys (described below). Of these school-leavers, one-hundred and two (102, or 56.7% of the total number of school leavers) were male, and seventy-eight (78, 43.3%) were female. Of those students who remained at school ($n = 410$, 69.5%), two-hundred and twenty (220, or 53.7% of those who stayed at school) were females, and one-hundred and ninety (190, 46.3%) were males. Thus, despite being roughly equally represented in the total sample, males were much more highly represented amongst the school leavers.

Measures

The present research used three separate, but related, instruments to measure important psychological constructs identified in the literature which may be implicated in students' decisions to leave school or not. These instruments were the Sense of Self scales from the Inventory of School Motivation (ISM), the General Achievement Goal Orientation Scale (GAGOS), and the Facilitating Conditions Questionnaire (FCQ) (McInerney, 1995, McInerney & Sinclair, 1991, 1992; McInerney & Swisher, 1995; McInerney, Yeung, & McInerney, 2001).

Specifically, in the present study, the Sense of Self Scales from the ISM were used to measure (a) students' General Self-Concept (i.e. students' evaluations of themselves as students), (b) their Sense of Purpose (i.e. the extent to which students perceive schooling and learning have a purpose beyond the immediate school context), and (c) their Self-Reliance (i.e. the extent to which students perceive themselves as able to complete tasks independently).

The ISM was also designed to measure specific components of students' motivational goals, such as task orientation, competitiveness, social power, affiliation and social concern (McInerney & Swisher, 1995). However, in recent studies the ISM has been further developed to include a new instrument - the General Achievement Goal Orientation Scale (GAGOS) (McInerney, Yeung, & McInerney, 2001). This instrument includes sets of items that reflect students' general motivation in three targeted areas drawn from goal theory. The areas are General Mastery goal orientation (i.e. wanting to succeed for internally referenced academic reasons, such as interest or competence), General Performance goal orientation (i.e. wanting to succeed for externally referenced academic reasons, such as achieving higher grades than others), and General Social goal orientation (i.e. wanting to succeed for socially referenced reasons, such as to feel part of a peer group).

The GAGOS also contains a Global Motivation scale that is comprised of 'precision alternatives' (i.e. items which are virtually identical) of the question "I am motivated at school". Precision alternatives were used here because the aim of this scale was not to measure the scope of a multi-dimensional construct. Rather, the aim of this scale was to provide a multiple item measure of a mono-dimensional construct. This was done because multiple items are able to provide a more reliable indicator (than single item indicators) of, in this case, students' overall motivation towards schooling.

Finally, the FCQ was used to measure constructs that may directly influence students' psychological states and, hence, indirectly influence their schooling outcomes. Specifically, the FCQ was used to measure the students' Positive Affect towards their schooling (i.e. the extent to which students' perceptions of school are associated with positive feelings [affect] about school), students' aspirations towards Further Education (i.e. whether students intended to go on to university or college after leaving school), and the Value (i.e. intrinsic importance) students' placed on their schooling.

The Sense of Self items from ISM, the GAGOS, and the FCQ all used an identical five point, Likert-type response format to measure students' responses to the items comprising each of the scales indicated above. For each of these instruments, Table 2 records:

- (a) the scales drawn from these instruments,
- (b) the number of items comprising each scale,
- (c) the means and standard deviations for school leavers and school stayers for each scale,
- (d) the reliability (using Chronbach's Alpha) of each scale with respect to the present sample, and
- (e) a sample item from each scale.

The scale reliabilities reported in Table 2 support the findings of the previous studies (cited immediately above), including a new study (i.e. McInerney, Marsh & Yeung, in press), which have demonstrated the robust psychometric properties of the ISMR, GAGOS, and FCQ across a variety of groups and research settings.

The remaining measure comprised a single item drawn from the FCQ that asked students: "What job do you want to have when you leave school?" (i.e. their desired occupation). Responses to this question were coded according the Socio-Economic Status (SES) of the desired occupation with "1" indicating professions with the highest SES, and

other professions descending in numerical order (to “7”) from this point. This ordering corresponded to categories used by the Australian Bureau of Statics (Farrell, 1993).

Table 2
Relevant Scales and Sample Items from the GAGOS, ISMR, and FCQ

Scale	No. Items	Stayers		Leavers			Sample Item
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
<u>GAGOS Scales</u>							
Global Motivation	8	3.60	.63	3.22	.72	.81	I am motivated at school.
Mastery Goal	5	3.99	.56	3.73	.65	.69	I am most motivated when I see my work improving.
Performance Goal	8	3.04	.80	2.89	.78	.82	I am most motivated when I am doing better than others.
Social Goal	5	3.39	.79	3.29	.84	.75	I am most motivated when I work with others.
<u>ISMR Scales</u>							
Self-Concept	12	3.55	.58	3.15	.61	.79	I am as good at school as most other students.
Sense of Purpose	6	4.28	.58	3.89	.76	.80	I try hard to do well at school to have a good job when I leave.
Self Reliance	12	3.51	.47	3.28	.48	.67	I often try new things on my own.
<u>FCQ Scales</u>							
Further Education	5	3.84	1.13	2.84	1.27	.95	I intend to go to college or university.
Value	8	4.25	.59	3.73	.86	.84	Education is important for me.
Positive Affect	2	2.85	.94	2.31	1.00	.64	I like working at school.
Desired Occupation	1	2.16	2.18	2.75	2.24	N/A	What job do you want to have when you leave school?

Note:

Bold-faced figures indicate variables that significantly discriminated between school stayers and school leavers.

Procedures

The participants completed the full ISM, the GAGOS and the FCQ during the 1999 school year (when all students were in Year 10). The survey was administered to in-tact year and class groups so that only absent students did not complete the survey. School records for the following (2000) school year (when the students were in Year 11) were used to determine which students had left the research schools or not. Due to the incomplete nature of some school records, it was possible that some students who were recorded as having left a particular school had not, in fact, left school 'for good'. These students' may have simply transferred to another school, or to another post-school educational destination. In order to determine whether this was the case or not, follow-up phone interviews were used to determine whether students who had left a particular school were, in fact, true school leavers. On the basis of these phone interviews, the original data for a small number of students was amended to reflect the fact that they were at another school, or at another post-school educational destination.

Discriminant Analyses

Discriminant Analysis is an appropriate statistical methodology for identifying independent variables that may 'discriminate' (distinguish) between groups with respect to a particular outcome (dependent) variable (Pedhazur & Schmelkin, 1991). Specifically, Discriminant Analyses are used where the dependent variable groups (in this case school leavers and stayers) are already known, and the interest is in developing models that correctly replicate these known groups on the basis of the independent variables included in the models. Another way of stating the above is that Discriminant Analyses are appropriate where the dependent variable is categorical, as opposed to nominal or continuous, and where the interest is optimising the accuracy of group classifications based on the categorical dependent variable.

Five core Discriminant Analyses were performed in this study. The first four of these analyses tested homogenous sets of variables relating to students' quantity (level) of motivation (with Global Motivation as the independent variable), their quality of motivation (with Mastery, Performance and Social Goals as the independent variables), their sense-of-self (with Self-Concept, Self-Reliance and Sense-of-Purpose as the independent variables), and their values and aspirations (with Value, Positive Affect, Further Education, and Desired Occupation as the independent variables). These analyses were conducted because it was of interest to determine what effect homogenous groups of variables identified in the literature may have on students' decision to stay at, or leave, school. The fifth analysis, in contrast, tested a heterogenous set of variables comprised of the significant discriminating variables identified in the previous four analyses. The purpose of this analysis was to determine whether significant variables identified in the first four analyses remained significant when tested against other variables from other sets. In each of the analyses described, the underlying alternative hypothesis was that each of the independent variables would discriminate between leavers and stayers when taken as multivariate group.

All Discriminant Analyses were conducted within the Statistical Package for the Social Sciences (SPSS, 1988). As recommended by several authors (e.g. Huberty, 1989; Thompson, 1995; Snyder, 1991) we avoided – for the most part - using stepwise variable selection in these analyses and, instead, entered all variables in each analysis as a single block. However, we also recognise that stepwise variable selection allows researchers to analyse the progressive contribution of variables to the classificatory accuracy of discriminant functions as a whole. This would be particularly useful in Analysis Five (the 'Best Discriminators' model) where the progressive contribution of each variable is perhaps of most interest. For this reason, and only after first conducting a block analysis on the variables in Analysis Five for which the overall classification statistics are reported (see Table 5), we conducted a parallel Stepwise DA on the best discriminators.

Univariate Analyses

In order to better interpret the results of multivariate Discriminant Analyses (in this case Analyses Two to Five), it is useful to first examine univariate group differences (in this case differences between the Stayers and the Leavers) with respect to each of the variables examined in the multivariate Discriminate Analyses (DAs). For the same reason, it is also useful to understand the percentage of correct classifications that may be attributed to each of the variables taken individually, before examining the classificatory accuracy of sets of variables taken together.

Two analyses were undertaken in order to examine these univariate differences and effects. First, in order to identify group differences on each of the variables, a single MANOVA was conducted with all eleven variables used in the DAs as the dependent variables, and school leaving or staying as the dichotomous grouping variable (fixed factor). Within this MANOVA, univariate tests for each of the variables were included. This procedure allowed for univariate group differences to be examined within the context of an overall multivariate probability estimate.

A similar strategy was used to examine the percentage of correct classifications attributable to each variable taken individually. Thus, a single DA with all variables was conducted to establish a multivariate probability estimate for all variables taken as a single block. A Chi-square test for this model (which provides an estimate for the improvement over the chance model – see below) was included in this analysis. Then, eleven follow-up univariate DAs (with accompanying univariate Chi-Square tests) were used to determine the classificatory accuracy of each of the variables taken individually.

Model Comparison

In all Discriminant Analyses, a certain percentage of correct classification will occur by chance. It is of interest to know ‘on average’ (i.e. across repeated samplings) what this percentage is likely to be. This is because the ‘chance’ model (also known as the ‘null’ or ‘independence’ model) can act as a base-line model against which to compare other (presumably more accurate) models. In two-group Discriminant Analyses – such as those used in this study - the null model will always classify 50% of cases correctly. This is because the null model starts by randomly assigning 50% of the cases to one group, and 50% of the cases to the other group. Over repeated sampling, we would expect X% of the cases assigned to the first group (where X% is the actual number of cases belonging to the first group in the sample as a whole) to be correctly classified. Conversely, we would expect (100 – X)% of the cases assigned to the second group to be correctly classified (again on average over repeated samples). The probability attached to the null model, then, is $[50\% \times X\%] + [50\% \times (100 - X)\%] = 50\%$ (cf. Klecka, 1980; Reynolds, 1984). In this study, for example, the correct derivation of the null model is $(50\% \times 69.5\%) + (50\% \times 30.5\%) = 34.75\% + 15.25\% = 50.0\%$.

A Chi-square statistic (with degrees of freedom equal to the number of variables in the analysis) can be computed for a DA. This statistic represents the improvement over chance in the classificatory accuracy of a DA model. A significant probability estimate associated with the Chi-square statistic means that the DA model in question correctly classifies significantly more cases than the null model. Moreover, where models are ‘nested’ i.e. one model (the ‘child’ model) contains a sub-set of variables in another model (the ‘parent’ model), a Chi-square difference test (χ^2) between the two models may be computed. This test is conducted by subtracting the Chi-square and associated degrees of freedom for the child model from the Chi-square and associated degrees of freedom for the parent model. The remaining Chi-square value (compared against the remaining degrees of freedom) acts as measure of how much better the parent model fits to the child model. In the present case the multivariate (parent) models were compared with the univariate (child) models to determine the degree of difference between them.

Multicollinearity

Multicollinearity (the extent to which variables in a Discriminant - or other - analysis share ‘common’ variance) can bias the results of a Discriminant Analysis (Pedhazur & Pedhazur

Schmelkin, 1991). It is, therefore, necessary to determine the extent to which variables in a Discriminant Analysis are multicollinear. Table 3 records the correlation matrix for the variables included in the present Discriminant Analyses.

Table 3
Correlations Amongst Variables in the Discriminant Analyses

	GLOB	MAST	PERF	SOCG	SC	SOP	SR	AFFE C	FURT H	VALU E	DESO C
GLOBMOT	1.00										
MASTERYG	.57***	1.00									
PERFORMG	.30***	.45***	1.00								
SOCIALG	.25***	.27***	.28***	1.00							
SC	.41***	.31***	.14**	-.10*	1.00						
SOP	.57***	.55***	.24***	.14**	.32***	1.00					
SR	.46***	.30***	.10*	-.06	.69***	.38***	1.00				
AFFECT	.56***	.38***	.14**	.12**	.36***	.50***	.42***	1.00			
FURTHERD	.24***	.30***	.13**	.06	.39***	.36***	.32***	.33***	1.00		
VALUE	.35***	.43***	.20***	.09*	.28***	.62***	.28***	.37***	.43***	1.00	
DESOCC	.19***	.17***	.04	.00	.18***	.24***	.16***	.22***	.34***	.21***	1.00

Note:

- *** = significant correlations at the .001 level
- ** = significant correlations at the .01 level
- * = significant correlations at the .05 level

Variable	Label (Above)	M	SD
Global Motivation	GLOBMOT	3.48	.68
Mastery Goal	MASTERYG	3.90	.60
Performance Goal	PERFORMG	2.99	.79
Social Goal	SOCIALG	3.33	.81
Self Concept	SC	3.42	.61
Sense of Purpose	SOP	4.16	.66
Self-Reliance	SR	3.43	.48
Positive Affect	AFFECT	2.67	.99
Further Education	FURTHERD	3.53	1.25
Value of Schooling	VALUE	4.08	.71
Desired Occupation	DESOCC	2.69	2.26

Table 3 indicates that most of the variables in the present analyses were significantly correlated with each other, although the absolute magnitude of these correlations is not large in many cases. Thirty of the 55 sub-diagonal correlations in Table 3 are .30 or below. Also, where correlations between variables are high (above .60) these correlations exist between variables which should be related theoretically e.g. Self-concept with Self-reliance, or Value of School with Sense of Purpose. Despite this, a unique sums-of-squares approach was applied to the Discriminant Analyses in order to deal with potential problems of multicollinearity (e.g. Marsh, Dowson, Pietsch, & Walker, in press). This approach only uses the unique variance attributable to each independent variable when calculating the effects of the independent variables on the dependent (grouping) variable (in this case, whether students had left school or not).

Results

Results of Univariate Analyses

The MANOVA with all variables included in the analysis was highly significant i.e. $F(11, 558) = 12.78, p < .001, \eta^2 = .201$. Moreover, with the exception of Performance Goal and Social Goal, the univariate F-tests associated with this MANOVA indicated that the group mean differences on each of the scales taken individually were significant (see Table 4). The DA with all variables included in the analyses was also highly significant ($\chi^2 = 126.42, df = 11, p < .001$), and Table 4 indicates that the classificatory accuracy of each of the variables taken individually ranged from 54.1% for Performance Goal to 67.5% for Further Education. The associated univariate Chi-square tests indicated that all variables, with the exception of Social Goal, correctly classified a significantly greater number of cases than the null model – with Performance Goal providing only a marginally significant improvement over the null model.

Table 4
Univariate Tests of Group Differences and Classificatory Accuracy

Variable	Mean Difference: Stayers – Leavers	Std. Error	Sig.	Total Correct Class. (%)	Chi-Square	Sig.
Global Motivation	.366	.060	.000	61.7	41.44	.000
Mastery Goal	.243	.054	.000	56.4	23.41	.000
Performance Goal	.129	.073	.079	54.1	3.85	.050
Social Goal	.009	.074	.188	55.3	2.06	.151
Self-Concept	.389	.054	.000	62.9	54.31	.000
Sense of Purpose	.389	.058	.000	62.9	46.27	.000
Self Reliance	.228	.043	.000	58.6	27.50	.000
Further Education	1.002	.107	.000	67.5	83.63	.000
Value	.522	.063	.000	66.2	64.34	.000
Affect	.552	.087	.000	59.4	37.88	.000
Desired Occupation	-.611	.201	.002	64.7	9.97	.002

Results of Multivariate Analyses

The results of the core Discriminant Analyses are presented in Table 5 and may be summarised as follows.

First, all core DAs correctly classified significantly more cases than the null model (with total accuracy for the models ranging from 56.4% of cases to 72.0% of cases). Second, three of the multivariate DAs classified a statistically significant number of cases more than their nested univariate DAs. For example, the χ^2 test for the difference between the multivariate Sense-of-Self model and the univariate Self-Concept model (the most accurate of the sense-of-self variables in the univariate analyses) was $78.79 (3df) - 54.31 (1df) = 24.48(2df)$, which was highly significant ($p < .001$). Similarly, χ^2 for the difference between the multivariate Values and Aspirations model and the univariate Further Education model (the most accurate of the Values and Aspirations variables in the univariate DAs) was $110.34 (4df) - 86.63 (1df) = 23.71 (3df)$ which was highly significant ($p < .000$). The Best Discriminators model also correctly classified significantly more cases than the univariate Further Education model [$129.97 (7df) - 86.63 (1df) = 43.34 (6df), p < .000$]. Thus, in each of these three multivariate cases, the addition of variables significantly improved the classificatory power of the initial univariate analyses.

Table 5

Summary of Multivariate Discriminant Analyses

Analysis	School 'Stayers'		School Leavers		Total	²	Sig.
	Correct Class. (%)	Incorrect Class. (%)	Correct Class. (%)	Incorrect Class. (%)	Correct Class. (%)		
<u>Global Motivation</u>	252 (61.5)	158 (38.5)	112 (62.2)	68 (37.8)	364 (61.7)	41.44	.000
<u>Goal Orientation</u>	233 (57.0)	176 (43.0)	98 (55.1)	80 (44.9)	331 (56.4)	23.15	.000
<u>Sense of Self</u>	275 (67.1)	135 (32.9)	121 (67.2)	59 (32.8)	396 (67.1)	78.79	.000
<u>Values and Aspirations</u>	290 (71.3)	117 (28.7)	119 (68.0)	56 (32.0)	409 (70.3)	110.34	.000
<u>Best Discriminators</u>	292 (71.7)	115 (28.3)	127 (72.6)	48 (27.4)	419 (72.0)	129.97	.000

Note:

Class. = classification; Sample size = 590

The one exception to this was the multivariate Goal Orientations model. In this case, Performance and Social goals were not included in the final discriminant function for the analysis. Hence, the multivariate result is identical (except for rounding error) to the univariate Mastery Goal analysis (compare the relevant entries in Tables 4 and 5).

Third, even in the analyses where the multivariate model was significantly more accurate than the nested univariate models, the absolute number of cases in the multivariate models classified over and above the most accurate univariate nested model was not great. For example, the multivariate Sense-of-Self model correctly classified 4.2% (i.e. 67.1% - 62.9%) more cases than the Self-Concept model. The multivariate Values and Aspiration model classified 2.8% more cases than the univariate Further Education model, and Best Discriminators model 4.5% more cases than the Further Education model. Nevertheless, despite the fact that these differences are small in absolute terms, their significance should not be disregarded. As always, there is a subjective balance between model parsimony and model accuracy that needs to be carefully weighed.

Best Discriminators Analysis

The Best Discriminators analysis warrants some specific attention. This analysis included the seven statistically significant Discriminators identified in the previous four multivariate analyses (i.e. Global Motivation, Mastery Goal, Self-Concept, Sense of Purpose, Positive Affect, Further Education, and Value – see the bold-faced figures in Table 2). Results of the analysis indicated that four of these variables i.e. Further Education, Value, Self-Concept, and Global Motivation significantly discriminated between school leavers and school stayers. Conversely, Sense of Purpose, Mastery Goal orientation, and Positive Affect did not remain as significant Discriminators when included in the same function as the other variables in this analysis. This indicates that at least part of the variance associated with later variables was 'shared' with other variables in the analysis. When this 'shared' variance was 'partialled out' in the unique sums-of-squares procedure, these variables were no longer significantly predictive within the discriminant function as a whole.

Parallel Stepwise Analysis of Best Discriminators. Results of the parallel Stepwise DA for Analysis Five indicate that Further Education (the variable entered at the first step)

correctly classified 67.5% of the cases (confirming the univariate result in Table 4). Adding Value to the discriminant function (at step 2) resulted in a further 1.1% of cases being correctly classified. Adding Self-Concept at step 3 resulted in the correct classification of a further 1.7% of cases, as did the addition of Global Motivation at step 4. This led to an overall correct classification of 72.0% of the cases, which was identical to the result of the block-entered DA. Also, as with the block-entered DA, all other variables in the Best Discriminators model did not significantly improve the classificatory power of the discriminant function, and so these latter variables were not selected in the stepwise analysis.

Comparing these results with Table 4 indicates that, although Value, Self-Concept and Global Motivation all correctly classified a substantial number of cases (over 60% in all cases) by themselves, they did not contribute much more in terms of additional cases correctly classified when Further Educational was already in the Discriminant function (as previously indicated). This result may be explained in terms of collinearity between the variables. Thus, students wishing to go onto further education also value school, have higher self-concepts, and express motivation towards their schooling (For evidence of this explanation see the positive and significant correlations between these variables in Table 3).

It should also be recognised that the SPSS DA program takes an a-theoretical approach to the order of selection of variables. This means SPSS simply selects the variable with the highest classificatory power first, the second, second, and so forth. There may be, however, theoretical reasons for ordering the variables in another way (although we have not proposed any here). If this were the case, the SPSS program would simply indicate that the first variable assigned to the stepwise DA (whatever that was) explained the 'lions share' of correctly classified cases (with the percentage of correctly classified cases at step 1 being exactly equal to the number of cases in the univariate DAs reported in Table 4). All other variables (at least in cases such as the present with substantially overlapping variables) would contribute far fewer additional correctly classified cases. For this reason, the relative weighting of variables in the stepwise DA with respect to the number of correctly classified cases needs to be interpreted with caution.

Summary

The results above may be summarised in tabular form (see Table 6) in order to provide an overall picture of the different levels of analysis utilised in the study, and the processes of variable elimination during these analyses.

Table 6 demonstrates how the 4 'best' variables were identified from the eleven initial variables included in the study.

Discussion

Univariate Analyses

Several patterns emerge from the results reported above. First, the direction of group differences in the univariate analyses is, in all but one case, exactly as hypothesised. The one exception is with respect to performance goals, where school stayers reported stronger adherence to these goals than school leavers. However, this difference was not statistically significant. These overall findings suggest that the theory underlying the proposed operation of these variables with respect to early school leaving is generally sound. Despite this, the exception with respect to performance goals adds to the contrary findings that often occur with these goals i.e. sometimes performance goals have been shown to be adaptive for schooling processes and outcomes and sometimes not (e.g. Barker, et al., 2002). Thus, further research into the effects of performance goals, and the theory underlying their operation, appears to be warranted.

Table 6

Summary of Analyses

Level of Analysis	Analysis Group	Variables Eliminated in the Analysis
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Univariate	All eleven initial variables taken individually	Social Goal not significant (but retained for the next level of analysis)
Multivariate	All variables taken in four homogenous groups	Performance Goal, Social Goal, Self-Reliance, Desired Occupation
	Seven 'Best Discriminators' taken as one group.	Mastery Goal, Sense of Purpose, Positive Affect
Variables Remaining		Further Education, Value, Self-Concept, Global Motivation

Second, the univariate analyses indicate that all but one variable in the analyses correctly classified a greater number of cases than would be expected by chance, and that the stayers and leavers displayed significantly different means on all but two variables. These results, apart from providing an initial framework within which subsequent results may be interpreted, indicate that with the exception of Social Goals, and to a lesser extent Performance Goals, the variables in the analyses are individually important in discriminating between leavers and stayers. This, in turn, provides some support for the literature suggesting that these individual psychological variables may be of some importance in discriminating between leavers and stayers.

Third, of the five most significant variables (in terms of cases correctly classified), four of these remained significant in the Best Discriminators analysis. Thus, the univariate analyses provides a fairly clear indication as to the variables that would emerge as most important in latter analyses. The one variable of the five to which this did not apply was Sense of Purpose. This variable displays the second and third highest correlations (with Value, .62, and Global Motivation, .57) of those reported in Table 3. As both Value and Global Motivation were included in the Best Discriminators analysis, multicollinearity between Sense of Purpose and these variables may explain why it did not feature in the Best Discriminators analysis. Thus, while the univariate results are indicative of the multivariate results, the relationship between variables must also be taken into account. This point leads to a consideration of the multivariate analyses.

Multivariate Analyses

In all but one case (i.e. Goal Orientations), the multivariate models correctly classified a greater number of cases than their most accurate univariate nested model. This suggests that the multivariate models are in general a better choice than the univariate models for discriminating between school leavers and stayers. However, it was also noted in the results that the additional number cases correctly classified by the multivariate models was not great in absolute terms.

As is typically the case, then, there is a difficult choice between model parsimony and model accuracy. In the present case, because correct identification of school leavers is at the centre of the purposes of the research, we would choose the multivariate models, particularly the Best Discriminators model, over the univariate models. This choice is perhaps made easier by the fact that only four variables are included in the Best Predicators model. Thus, only four of the original eleven variables 'survived' the model testing process – suggesting that Best Discriminators model is relatively parsimonious as well as being the most accurate.

Multivariate Models with Homogeneous Variables

Multivariate Discriminant Analysis Two (Goal Orientations) indicates that students' mastery goal orientations may be important in determining their leaving or staying behaviour. However, mastery goals were a relatively poor discriminator of staying or leaving when included with other key variables in Analysis Five. This suggests that in comparison with

other goal orientations mastery may discriminate leaving or staying behaviour, but this is not the case in comparison with other types of variables. This is an interesting finding as the literature (e.g. Dweck, 1992; Elliot, 1997; Harackiewicz, 2000) has suggested that mastery goal orientations are important for students' engagement in learning. However, this study suggests that mastery goals may not be as important for the 'threshold' issue of whether students actually stay at school or not. In other words, once in school mastery goals may be important for student engagement, but they may not be as important in determining whether students actually stay at school or not in the first place.

Analysis Three (Sense of Self variables) suggests that both self-concept and sense of purpose are important discriminators of school staying or leaving. However, only self-concept remained an important indicator when included in Analysis Five. This suggests that students' sense of purpose is an important discriminator when compared against other sense-of-self variables, but not necessarily against other types of variables. Conversely, self-concept appears to be a more robust indicator of staying or leaving behaviour. This may be an important finding because much self-concept research has focussed on academic achievement as the key outcome variable (e.g. Marsh, 1993; 1990b). The present research helps extend self-concept research to another important schooling outcome, and in doing so highlights the importance of self-concept as a psychological variable in school settings.

The desire to go onto further education, the value of schooling and positive affect towards schooling were all significant discriminators of school staying or leaving in Analysis Four. Moreover, this set of variables, as a homogeneous group, best predicted staying or leaving amongst students. However, positive affect did not remain a significant discriminator when included in Analysis Five, suggesting that aspirations to further education and valuing schooling may be more robust indicators of leaving or staying behaviour. Interestingly, desired occupation was not a significant discriminant of school staying or leaving. It may be that this variable represents too distant or uncertain choices in students' minds in comparison with (say) the more immediate (proximal) choice to go on to further education, whatever the perceived occupational outcome(s) of that education.

Extending Early School Leaving Theory

The Introduction suggested that, in the light of partially successful models for predicting school leaving and partially successful intervention strategies addressing school leaving, that a further investigation of psychological variables implicated in school leaving may be useful. Results of the study suggest that several psychological variables may assist in discriminating between school leavers and stayers. Moreover, the pattern of responses with respect to these variables was more or less exactly as predicted from the theory e.g. in the final analysis, school stayers report stronger aspirations to further education, higher value for schooling, higher self-concepts and greater overall motivation.

For these reasons it is possible to suggest that future studies may profitably investigate whether the variables identified in the present study are useful in interventions with potential early school leavers. With respect to this point it is interesting to note that many programs for potential dropouts at least allude to psychological objectives and interventions (Szirom, 2001). Such objectives and interventions include increasing students' overall motivation, self-concept, and positive attitudes concerning the usefulness of school (Hamby 1989; Hernandez, 1995; McCormick 1989; Steinberg, 1996). The present study supports the general thrust of these interventions, and suggests that these interventions may be enhanced by more targeted approach to influencing students' psychological states.

From a somewhat more theoretical perspective, although a range of psychological variables may be implicated in students' decisions to stay or leave school, a relative few of these variables may be particularly important in determining whether students stay at school or not. Conversely, it also interesting to note what variables were not implicated in identifying school leavers in this study. Much, for example, has been made in the literature concerning the effects of students' goal orientations on their engagement in, and outcomes from, schooling and learning (e.g. Ainley & Allen, 1997; Barker, et al., 2002; McInerney, et al.,

1997; McInerney, et al., 1998; Roeser, et al., 1996; Urdan, 1997). Despite this, this study indicates that this class of variables had very little impact on students' retention at school. Of much more importance to their retention at school was students' overall level of their motivation towards schooling, regardless of the particular quality (orientation) of that motivation. This study, then, may indicate that the role of students' goal orientations (with respect to at least one very important outcome of schooling) has been somewhat over-emphasised.

Whatever the merits of this observation, it would be very helpful for future research to also explore the salience of a limited range of psychological variables to determine which may be implicated in school leaving across a variety of contexts. The particular importance of this study for such research is that it may direct future studies towards particular variables, or even particular sets of variables (e.g. values and aspirations) that are most likely to discriminate between school stayers and leavers.

Limitations

Although Discriminant Analyses are appropriate for the present research design, other methodologies such as Logistic Regression (e.g. Marcoulides & Hershberger, 1997), or even Structural Equation Modelling with categorical dependent variables (e.g. Green & Thompson, 2003), represent potential alternative methodologies. Logistic regression, for example, can have the advantage of being less sensitive to deviations from normality in the predictor variables, and can also provide the opportunity to test mediating effects between predictor variables (as can Structural Equation Models). However, MANOVA-type models, of which Discriminant Analysis is one, are typically more rather than less conservative where deviations from normality exist in predictor (independent) variables (Cole, Maxwell, Arvey & Salas, 1993). Thus, it is unlikely that deviations from normality in the present independent variables will have inflated the significance of results. Despite this we recognise that Discriminant Analyses have limitations, and are not the only appropriate methodology for analysing categorical dependent variables.

The major theoretical limitation of the study revolves around the fact that it cannot be stated with certainty that (a) the psychological variables selected are of most importance for discriminating between school leavers and stayers or (b) that psychological variables are the most important class of variables to investigate when discriminating between leavers and stayers. This is especially true given that the research is more exploratory than confirmatory. However, what can be said is that the psychological variables selected, and psychological variables as a class, are theoretically associated with school leaving (either directly or indirectly). Moreover, the overall accuracy (over chance) of the models in this research suggests that the variables selected are salient at least with the present sample. Further research, however, will be necessary before more definitive statements with respect to the relationship between these variables and school leaving may be made.

Conclusion

This study has identified some key psychological variables that discriminate between students' choices to stay at, or leave, school. This list of variables is by no means definitive. However, by systematically investigating a range of possible psychological variables that may influence school leaving, the study has demonstrated that some variables are more salient than others in discriminating between leavers and stayers. This finding provides a direction for future research, and a possible indication to researchers and practitioners concerning the types of interventions that may be most effective in influencing students to stay at school.

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