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Learning strategies and academic success of undergraduate arts students

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2015-01-15
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TABLE 23

FREQUENCY DISTRIBUTION OF LS AND FCREDITS1

		FCREDITS1		TOTAL
LS		0 - 1	2 - 4	
GOOD HOLISTS (H1)	n	0	7	7
	%	0	100	
POOR HOLISTS (H2)	n	1	5	6
	%	17	83	
GOOD ATOMISTS (A1)	n	16	37	53
	%	30	70	
POOR ATOMISTS (A2)	n	24	28	52
	%	46	54	

N = 118.

χ = 8.10; df = 3; $p \leq 0.04$

Contingency Coefficient = 0.25

The results of this analysis show that when learning strategies are divided into four levels there is a significant relationship between learning strategies and academic success at the end of first year. However, the contingency coefficient drops considerably from mid-year (0.40) to the end of the year (0.25). A closer examination of the distribution reveals that 100% of good holists obtained two or more credits, while 83% of poor holists also managed to pass with two or more credits. Thus there is no difference from mid-year to the end of year for Holists, as all good holists passed while 83% of poor holists passed first year. The Atomists on the other hand present a different picture in that 46% of poor atomists failed first year with one or less credits, although 70% of good atomists managed to pass first year with two or more

credits. The major difference here between mid-year and finals is that the failure rate of poor atomists has declined from 62% in mid-year to 46% at the end of the year. The frequency distribution of final year credits still reveals a stepwise pattern (see underlying) that moves from a 46% failure rate (A2) to everybody passing (A1).

The relationship between the four levels of learning strategies (LS) and average marks obtained at the end of the year is examined (table 24).

TABLE 24

ANOVA BETWEEN LEARNING STRATEGIES (LS) AND MID-YEAR AVERAGE (JAVERAGE).

VARIABLE	CRITERION	df	F Value	R-Square
LS	- Faverage	3	3.97 *	0.10

* = significant at 0.05 level

The results of this analysis reveal that there is a significant relationship between the four levels of learning strategies and average mark at the end of first year. In this case the R-Square value is 0.10, meaning that learning strategies are explaining about 10% of the variance in academic performance at the end of the year. Again there is a drop from the mid-year result (R-Square = 0.19) to the end of year result (R-Square = 0.10). However, this drop can be somewhat actributed to the nature of the criterion variable. As discussed previously the average mark criterion does not reflect the number of courses from which the average was derived.

Thus poor atomists may in fact have dropped courses from their curriculum and concentrated on only studying two courses, thus improving their pass rate. A limitation of the present study is that it has not examined the course discard rate across the different levels of learning strategies.

The direction of the significa[illegible] regarding learning strategies was examined by using Tukey's test for differences between pairwise comparisons (Runyon & Haber, 1980). The results are presented in table 25.

Table 25

PAIRWISE COMPARISONS BETWEEN CATEGORIES OF LEARNING STRATEGIES AT THE END OF FIRST YEAR

LS Comparison	Difference between means	
H1 - H2	2.92	
H1 - A1	2.21	
H1 - A2	7.35	*
H2 - A1	0.72	
H2 - A2	4.44	
A1 - A2	5.20	*

* denotes significance at 0.05 level

An examination of the results reveals that good holists (H1) still do significantly better academically than the poor atomists (A2). However, by the end of the year poor holists (H2), unlike the mid-year results, do not do significantly better academically than the poor atomists (A2). Finally, the table reveals that good atomists (A1) still do significantly better academically than poor atomists (A2). These findings will be examined further in the discussion section.

5.6 SCHOOL PERFORMANCE AND ACADEMIC SUCCESS AT THE END OF FIRST YEAR.

Again it was necessary to exclude the effects of school results from the relationship between learning strategies and academic success. A Pearson Product Moment correlation coefficient was used to examine the relationship between matric results and end of year average while a one way Anova was used to examine the relationship between matric and the number of credits obtained at the end of first year. These results are presented in table 26.

TABLE 26

CORRELATIONS OF MATRIC RATING WITH END OF YEAR CREDITS AND END OF YEAR AVERAGE

VARIABLE	FCREDITS	FAVERAGE
MATRAT n = 118	F = 2.72; df = 4 p ≤ 0,03 *	r = .16 p ≤ 0,08

* denotes significance at 0.05 level

The results of this table (like learning strategies) clearly demonstrate a decline of the predictive ability between school and academic performance. The results of the Anova with final credits is still significant but there is a decline in the R-square value at mid-year (0.10) to the value at the end of the year (0.09). More important is the finding that there is no significant relationship between matric rating and final year average. It is felt that as there is a relationship between final credits and matric rating; that this result is indicative of the problems inherent to the average criterion in that it does not reflect the amount of courses which comprise the measure. However, given this result it is still necessary

to examine the relationship between learning strategies and academic success while controlling for the effects of matric. The resultant ANCOVA is presented in table 27 .

TABLE 27

ANCOVA BETWEEN LEARNING STRATEGIES (LS) AND MID-YEAR AVERAGE (JAVERAGE) CONTROLLING FOR EFFECTS OF MATRIC.

VARIABLE	CRITERION	df	F Value
LS/MATRAT	FAverage	3	3.76 **

** = significant at 0.001 level

The findings above indicate that even given the problems inherent in the criterion variable of end-of-year average. The ANCOVA still reveals a significant relationship between learning strategies and academic performance while controlling for the effects of matric. Indeed the results demonstrate that when controlling for school results learning strategies still manage to explain 9% percent of the variance of a problematic criterion.

The above results for both mid-year and end of year criterion measures conclusively and collectively support the major hypothesis of this study.

5.7 SUMMARY OF FIRST-YEAR FINDINGS

A summary of the findings at end of the first academic year reveals that in accordance with the mid-year findings the two level classification of

learning strategies is not significantly related to academic success. Again it can be concluded that the two level classification of learning strategies is a crude measure which is not particularly useful in predicting tertiary academic success.

However when the four-level classification of learning strategies was used a significant relationship was found between the four levels of learning strategies and credits obtained in June. However the strength of this relationship declined from a contingency coefficient of 0,40 at mid-year to 0,25 at the end of the year.

The frequency distribution of learning strategies and credits obtained revealed a movement from everybody passing (Good Holists) to 43% failing (Poor Atomists). This relationship was further confirmed by the findings that the four levels of learning strategies are significantly related to the mid-year average. However, problems in the nature of the criterion could partly explain the drop in the R-Square value from 19% in June to 10% at the end of the year. The non-significant relationship between matric and end of year average gives support to the notion of criterion related problems.

Pairwise comparisons revealed that differences at the end of the year existed between, Good Holists and Poor Atomists, and Good atomists and Poor atomists. Finally it was found that learning strategies still predict well for end of year academic success when the effects of school results are controlled for. Again this implies that learning strategies are independent of matric results.

25×10

5.8 INTELLECTUAL FUNCTIONING AND ACADEMIC SUCCESS

The relationship between a traditional measure of intellectual performance and academic success was examined by Pearson Product Moment correlations. The Deductive Reasoning Test (DRT) was thus correlated with two performance criterion, namely Javerage and Faverage. The results are presented in table 28.

TABLE 28

CORRELATIONS BETWEEN DRT AND CRITERION MEASURES

VARIABLE	JAVERAGE	FAVERAGE
DRT	$r = .15$ $p \leq 0.14$	$r = -.03$ $p \leq 0.78$

Results of these correlations clearly indicate that there is no significant relationship beween a traditional standardised psychometric measure of intellectual functioning (DRT) and tertiary academic performance.

5.9 LEARNING STRATEGIES AND ACADEMIC PROGRESS

An examination of the range of the criterion variable 'number of credits obtained by the end of the second year of university study (CREDSEC), reveals that credits obtained, range from 2-9 with a mean of 5.48, a standard deviation of 1.66 and N = 88. According to Mcnemar (1969) as this variable approximates a normal distribution, the use of the ANOVA

technique in this instance is appropriate. The same principle applies to the variable number of credits obtained by the end of the third year of study (CREDTHIR). The range of CREDTHIR is 2-13, with a mean of 8.07 a standard deviation of 2.24 and n = 83. The results of ANOVAS between learning strategies and academic progress are presented in table 29.

TABLE 29

ANOVAS BETWEEN LEARNING STRATEGIES AND ACADEMIC PROGRESS

VARIABLE N =	CREDSEC N = 88	CREDTHIR N = 83
COMB	F = 2.99; df = 1 p ≤ 0.09;	F = 3.45; df = 1 p ≤ 0,08
LS	F = 2.91; df = 3 p ≤ 0,03 *	F = 2.29; df = 3 p ≤ 0,08

* = significant at 0.05 level

The results in table 29 demonstrate that the two-level classification of learning strategies is not significantly related to academic progress after first year. However the four-level classification of learning strategies shows a significant relationship with the number of credits obtained after two years of study (R-Square = .09). This represents a slight decline from the R-Square of 0.10 obtained at the end of first year. When learning strategies are examined against the third year of study the relationship just loses significance ($p \leq 0.08$) with the R-square value being 0.08.

This finding is consistent with the notion that the university context should in itself bring changes in student learning strategies (Wilson,

1981). The findings (see table 30) show that the strength of the relationship between the original classification of learning strategies and subsequent academic progress gradually declines as students progress through their academic careers.

Table 30
Declining Relationship between learning strategies and academic performance.

VARIABLE	JAVERAGE	FAVERAGE	CREDSEC	CREDTHIR
LS	R = 0,18 *	R = 0,10 *	R = 0,09 *	R = 0,08

* = significant at 0,05 level

As it has been established previously that learning strategies are independent of school results, it follows that learning strategies are significantly related to academic progress at least up until the end of the second year of study.

A close examination of the frequency distribution of categories of learning strategies who have obtained 9 or more credits after three years of study (table 28), reveals a descending pattern from 100% of good holists obtaining 9 or more credits to only 36% of poor atomists obtaining similar results.

TABLE 31
FREQUENCY DISTRIBUTION OF LEARNING STRATEGIES WITH NINE OR MORE CREDITS AFTER 3 YEARS OF STUDY

STRATEGY	≥9 credits	%
H1	7	100
H2	3	60
A1	21	55
A2	12	36

This result implies that the university context is not **sufficient** in itself to bring about meaningful changes in student learning strategies. Compensatory academic support programmes are therefore vital, particularly for poor atomists who are most at risk in terms of academic failure.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

6.1 INTRODUCTION

This section will discuss the findings and implications of the results of this study in terms of a number of issues raised in the introductory chapters. These will be discussed under the following headings:

1) Discussion of results.
2) Implications for tertiary academic selection and prediction.
3) Implications for traditional intelligence testing and academic prediction
4) Implications for current research trends in academic prediction.
5) Implications for disadvantaged students.
6) Implications for university teaching methods and compensatory academic support programmes.
7) Limitations of present study and future research
8) Summary and conclusions

6.2 DISCUSSION OF RESULTS

All three hypothesis have been supported by the results of this study. The major finding of the present study was that only 13 (11%) out of the 118 students in the sample could be classified as holists. This was somewhat in line with the literature in that both Svensson (1976) and Entwistle

(1977) found that most Swedish and British first-year students were surface processors or atomists. However, in Sweden the percentage of holists numbered 30% of the sample and in Britain it was slighly higher at 38%.

According to Entwistle (1977), the low incidence of holists in higher education can be expected as school experience promotes atomistic working. This contention has been noted by most of the researchers in this paradigm (Entwistle & Hounsell, 1977; Lurillard, 1979; Marton & Saljo, 1976; Ramsden, 1977). However, most researchers in the field have argued forcibly against perceiving these learning characteristics as being inviolate static traits, instead asserting that the learning context itself can influence characteristic learning strategies to learning. Perry (1970) argued that the tertiary academic environment should in itself effect changes in student approaches to learning. The gradual decline in the predictive ability of learning strategies in this sample lends empirical support to this contention. The implications of this finding are vital for conceptions of tertiary academic performance as they imply learning strategies can be transcended and changed, especially if directly addressed by compensatory learning courses whose content focuses on holistic and atomistic approaches to learning.

In terms of the literature the low incidence of Holists in this study was therefore partly expected, however the percentage of Holists was still much lower than that obtained in other studies. The relative absence of holistic approaches in a sample based only on white (advantaged?) students was thus an indictment on the educational system that they came from. This problem could be expected to be particularly acute when examining students

coming from a disadvantaged educational system.

Considering how few students in the sample could be classified as good holists, the implication is that it is not only black students who are disavantaged but rather that education in South Africa involves relative deprivation. The low incidence of Good Holists certainly suggests that the Commitee of University Pricipals have good cause to be concerned with the high failure rate of first year university students.

The results of this study consistently demonstrate that poor atomists are extremely at risk academically, especially during their first year of study. Although this relationship becomes less severe after second year it has been shown that only 36% of poor atomists have nine or more credits by the end of three years of study as opposed to the 100% of good holists. In addition the results show that although 70 % of good atomists manage to pass, their academic progress in later years is not as good as either of the two holist categories.

An interesting finding is that in terms of university success good atomists, who essentially reproduce facts sequentially, still manage to do well at University. The results demonstrate that 77% of atomists passed at mid-year while 70% managed to pass their final examinations at the end of the year. This supports Ramsden's (1979) comment that while university lecturers say they require students to transform information by making broader connections and inferences, evaluate the facts presented and draw conclusions, the actual demand characteristic is a straight reproduction of facts. The fact that no statistically significant difference in terms of academic success beween the holists and good atomists has been found

lends support to the above argument. However, the fact that all Good holists passed first year and continued passing up to third year implies that the ability to transform information is nonetheless an important component of tertiary academic success. Indeed only 55% of good atomists had 9 or more credits by the end of three years as compared to the 100% of good holists. The conclusion that can be drawn is that Good Atomists who can identify main arguments with supporting evidence in a coherent manner do pass, but not as well as those who can transform information and look for conclusions.

Although Svensson (1977) and Marton and Saljo (1976b) conceptualise holists and atomists as comprising two distinct learning strategies, the results of the present study imply that this is more of a continuum than discrete categories. In terms of the present classification it could be argued that a good holist is really a higher level manifestation of a good atomist, in that the Good holist category includes the ability to identify main arguments with supporting evidence, but then goes beyond the good atomist by transforming the information and adding to it by looking for associations and conclusions.

The significant relationship found in this study between learning strategies and academic performance is congruent with the findings in the United Kingdom and Sweden, and adds to the growing literature concerning the processes underlying learning and the way in which these processes relate to tertiary academic success.

6.3 IMPLICATIONS OF LEARNING STRATEGIES FOR ACADEMIC PREDICTION

Before concluding that learning strategies have proved to be a decisive predictor of academic success, it is important to bear a number of disadvantages inherent in the present study. The classification and operationalisation of learning strategies in this study has not been attempted before. Given the novelty of this research it would be premature to conclude that learning strategies as classified in the present study is a consistant and reliable predictor of academic success.

Shochet (1986) argues that novel research into academic prediction should be conceptualised as 'preliminary predictive research', pending confirmation from subsequent research. This is particularly important as the small number of holists in the study was not as large as would have been hoped for in predictive research. Though this does not mean that broader implications cannot be drawn from the results in terms of approaches to selection and academic prediction, it does mean that the results need to be treated with caution, and viewed as preliminary findings. In addition this research is only based in the Faculty of Arts and thus generalisations cannot be made across faculties. Indeed Biggs (1970) has pointed to the different learning demand characteristics found between arts and science faculties. According to Biggs (1970), science faculties generally place more emphasis on the reproduction of 'objective facts' than on the transformation and restructuring of information which is often called for in arts faculties. He sees this as a direct consequence of the nature of the two disciplines where subjects in the arts tend to be more abstract, philosophical and less absolute than the type of material that would for example comprise a chemistry course. A study by Cloete & Lolwana (1984) in fact revealed no significant relationship between learning strategy and success in the science faculty.

Future research should aim at extending learning strategies into different faculties.

Given the above constraints the present study has clearly demonstrated that learning strategies are a good predictor of first-year BA academic success. Anastasi (1982) defines predictive validity as the capacity of a measurement to predict a criterion score over a period of time. The present study has certainly met this requirement in that there is a strong relationship between student learning strategies and first year academic success. The classification method used in the present study thus seems to be measuring what it purports to measure and furthermore has demonstrated that it is a reliable enough measure to predict success over a period of one year. The results consistently show that the poor atomists perform significantly worse than all the other categories of learning strategies. In addition, the results show that although the good atomists manage to pass, their academic progress in later years is not as good as either of the two holist categories. This implies that the sequential reproduction of 'facts' becomes less useful to students after their first year of study and that the emphasis in second and third-year courses is more on transformation, interpretation, synthesis and abstraction.

Another major factor which demonstrated the usefulness of learning strategies for academic prediction was that learning strategies were shown to be independent from matric rating. Matric rating was however shown to correlate with academic success at mid-year although this relationship was considerably lower than that found in other studies. Shochet (1986) for instance found that matric had a 0.55 correlation with first-year academic success for white advantaged students, thus explaining approximately 30%

of the variance in first-year final results. Given that school results have historically proved to be the best single predictor of tertiary academic success, it is reasonable to argue that for advantaged students using both school results in conjunction with learning strategies could go a long way to accounting for a major proportion of variance in first-year university success. The finding that poor atomists are most likely to fail at university, in conjunction with the research evidence that students with a low matric rating are also likely to fail, thus provides selection-commitee authorities with a reliable exclusionary category. In other words white students with low matric ratings who are classified as poor atomists are most likely to fail at university.

It must be stated, however, that the learning strategies paradigm goes beyond mere prediction in that the classification of learning strategies is immediately linked to remediation. Correlations of matric results (the products of learning) and academic success do not tell us anything about the nature of success at university, merely that there is a relationship between matric (product) and success. Learning strategies on the other hand link the way in which students learn (the process) with success. The former method thus leads to elimination while the latter leads to understanding and points to remediation

6.4 IMPLICATIONS FOR TRADITIONAL INTELLIGENCE TESTING AND ACADEMIC PREDICTION

The results of this study lend empirical support to critiques of static measures of intellectual functioning. The present study finds no

relationship between the Deductive Reasoning Test and tertiary academic success. Indeed, a negative correlation exists between DRT and final year average. Particularly condemning is the fact that the DRT is perceived as satisfying most requirements of psychometric theory in that it has good reliability coefficients, appropriate levels of complexity, has been normed on university students, is in the language medium used at the university and has face validity in terms of the perceived relationship between its constructs and success at university.

The findings of this study did not support the geneticist and environmental conceptions that there was a relationship between static measures of intellectual functioning and tertiary academic performance. The findings of this study were not unique; Shochet (1986) found no significant relationship between the Deductive Reasoning Test and tertiary academic success. In addition, he found that a non-verbal test of intellectual functioning derived from Raven's Progressive Matrices (Pattern Relations Test) did not predict academic success for either advantaged or disadvantaged students.

More problematic for advocates of static notions of intelligence or 'g', underlying performance on these tests were his findings that performance on both tests could be dramatically altered through a relatively brief teaching intervention. Shochet concluded his study by stating:

> " It is suggested by the results that both the environmentalists and geneticists who have adopted static approaches to intellectual functioning have been perpetuating a long-standing myth that the scores on these tests of intellectual

> functioning can provide a measure of "intelligence" or "aptitude" or "potential" that is stable and predicts over a period of time. Geneticists have explicitly perpetuated this myth and the environmentalists have implicitly perpetuated it by using static attempts at culture-fair testing." (Shochet, 1986, p 296).

The main issue here is not so much whether tests of intellectual functioning or 'aptitude' in fact do or do not correlate with success at university; although this has been the major assertion of theorists in this area, but that the theoretical and ideological notions underlying intelligence and aptitude testing are based on false premises. As was shown in earlier chapters, culture-fair attempts at adapting the tests by renorming, changing items, or statistical manipulations have really only served to reinforce static notions of 'g' rather than fundamentally challenging the underlying premises of the paradigm.

The overwhelming evidence is that tests of "intelligence" or "aptitude" are not particularly useful in predicting tertiary academic success (Evans & Waites, 1981; Entwistle et al, 1977; Entwistle, 1984; Houston, 1983; Levenstein, 1970; Karnes & Teska, 1970; Shochet, 1986; Slack & Porter, 1980) and it seems that the time has come for a fundamental paradigm change in this area. It is suggested that the present study, by arguing that learning strategies are something acquired and can be changed, represents a fundamental shift in paradigm away from static notions of "g" "aptitude" or "potential" which have dominated this area of research for so long.

6.5 IMPLICATIONS FOR CURRENT RESEARCH TRENDS IN ACADEMIC PREDICTION

As discussed in chapter two, research into tertiary academic prediction has generally been disappointing. Research into non-cognitive factors underlying academic performance may well provide some of the answers in the future, but the current state of findings in this area is so diffuse and unco-ordinated that it is impossible to make any coherent conclusions in this area. The general findings at this stage, however, remain modest and inconclusive (Shochet, 1986).

As has been stated throughout this study, school results remain the single best predictor of academic success to date (Chopin et al, 1973; Entwistle et al, 1977; McDonnel, 1975). Although school results remain the best predictor of academic success, the majority of variance remains essentially unexplained. (Entwistle et al, 1977; Darling, 1983). The results of this study confirm these findings in that only a weak correlation ($r = 0.16$) has been found between matric rating and academic success at mid-year. Entwistle (1977) and Shochet (1986) have also pointed to the unreliability of school results in the lower ranges to predict academic success. These findings have led to general acknowledgement that it is necessary to supplement school results with other predictors. In this regard then the present study has contributed substantially to accounting for variance in academic success not accounted for by school results.

The question that begs to be answered is if learning strategies are not related to school results then why does matric correlate at all with academic success? The list of possible interpretations is endless; for

instance matric could be measuring things such as endurance, the ability to deal with stress (exams), time management etc. The point is that a matric rating does not lead to an understanding of the factors which have resulted in the student receiving that rating. Thus a correlation between it and university success leaves us none the wiser as to why this is in fact the case. The fact that learning strategies are independent of matric also implies that success in matric is independent of holistic abilities to transform, abstract and reorganise information, but rather that the stress is on the reproduction of facts which both atomists and holists are capable of doing.

Of more importance in the South African context is the finding that matric results of disadvantaged students demonstrate little or no relationship at all with academic success (Potter, Jamotte & Van Der Merwe, 1983a, 1983b; Shochet, 1986). This finding has created an urgent and pressing need to find predictors that are viable for both advantaged and disadvantaged communities. The learning processing paradigm which stresses the context, content and metacognition factors involved in learning and the acquisition of knowledge is a paradigm that is capable of providing some of the solutions to this dilemma. A major strength of the learning processing paradigm is that it leads to an understanding of the constituents underlying academic success as opposed to correlation coefficients which focus solely on the relationship but not the factors underlying the relationship of the measure to academic success.

6.6 IMPLICATIONS FOR DISADVANTAGED STUDENTS

The extent to which students emerging from the DET system suffer

educational disadvantage has been well documented (Hartshorne, 1984). The present study focuses only on advantaged students for good reason, in that it is expected that most students coming from the D.E.T. system will be atomistic processors due to the predominant demand characteristics of that system which stresses verbatim memorisation and rote learning (Slonimsky & Turton, 1985). In addition, Rothkoph (1968) argues that rote learning is not the same as being a good atomist which at least requires the ability to identify main arguments with supporting evidence.

The importance of the learning processing paradigm for disadvantaged students is that contrary to traditional intelligence or aptitude models that stress innate abilities which allow for racial and genetic interpretations of low performance, learning strategies point to acquired learning approaches through context determination. This implies change and remediation is possible and certainly desirable if the aims of education are to be understanding rather than reproduction. At the same time it provides the basis for the content of the remediation programmes. However, this view is not that of a cognitive skill deficit model such as Feuerstein's cognitive deficiency theory, indeed the assumption is that the cognitive skills exist but that the D.E.T. system has systematically trained these students against using them in the educational context. Miller (1989) argues in this regard that; " students from disadvantaged backgrounds may be over-prepared in the sense that what impedes their progress at university is not new learning but relics of what Vygotsky called 'fossils'of old learning". (p158) Slonimsky & Turton (1985) point to the high level of critical thinking evidenced by black students when engaged in political debate as evidence

of well developed cognitive skills of extraction of main ideas, transformation, critical analysis and evaluation - all features of holistic processors. Their contention is that these skills are not used in their school work because the demand characteristics of the D.E.T. are in fact rote learning and regurgitation and, as school is the new students basic model of academia, these approaches are continued in the university context. In the light of the above arguments it seems quite obvious why research into the relationship between D.E.T school results and university success shows no meaningful pattern whatsoever.

The gradual decline of the predictive ability of learning strategies found in this study does suggest that the university context itself does begin to exert a counter influence on atomistic approches to learning. However, the fact that holists have more credits by the end of third year suggests that to rely on the context itself is insufficient and that remedial programmes based on the awareness of the learner and the content of what is learnt, needs to be instituted to facilitate the achievement of academic success.

6.7 IMPLICATIONS OF THE LEARNING STRATEGIES PARADIGM FOR UNIVERSITY TEACHING METHODS AND COMPENSATORY ACADEMIC SUPPORT PROGRAMMES.

Although the learning processing paradigm has important implications for teaching methods at university it must not be forgotten that the problems experienced by disadvantaged students is a direct result of socio-political factors. The learning strategies paradigm, unlike traditional theories of intelligence, does not locate poor performance as an internal 'pathology' of the individual. Instead by stressing the

contextual determination of approaches to learning the paradigm takes account not merely of immediate environmental determinants on educational performance, but also the wider socio-political arena. It would be wrong to perceive teaching methods as the sole determinate on students' learning approaches, but rather that there is a dialectical relationship between these methods and the socio-political milieu in which they are articulated.

It is to the country's deep ignominy that tertiary educators are faced with having to deal with the end results of a 'Verwoerdian' policy which had as its main aim the political, economic and mental subjugation of the majority of people in this country.

> "There is no place for him (the black man) in the European community above the level of certain forms of labour...for that reason it is of no avail for him to receive a training which has as its aim absorption in the European community, where he cannot be absorbed. Until now he has been subjected to a school system which drew him away from his own community and misled him by showing him the green pastures of European society in which he was not allowed to graze." (Verwoerd, 1954, p. 23)

Thus the learning strategies paradigm is no universal panacea for political and social inequalities and if socio-, political and educational reforms are neglected then tertiary educators in this county will continue to be forced into playing the uncomfortable role of applying symptomatic final-hour band-aid treatment to the majority of the youth of this

country. The aim of selection is surely not to identify those students who have university potential despite the effects of an abysmal educational system but rather those students who have the potential to succeed after benefiting from an equitable and just educational system.

The stress on the context of learning also changes the focus from the individual to the learning environment. The paradigm does not focus solely on the individual and how the individual must change but also on the institutional context of learning. The results of the present study have demonstrated a link between learning strategy and academic success. The question therefore arises as to how inappropriate learning strategies can be changed.

What is clear is that teaching and assessment methods direct and reinforce student approaches to learning (Marton & Svensson, 1979; Ramsden, 1979). The evidence according to Ramsden (1988) is often negative as pleasing teachers and gaining high grades is often at variance with understanding. Ramsden (1988) argues that the assessment procedures used in higher education often encourage passive, reproductive forms of learning while simultaneously hiding the inadequate understanding to which such forms of learning invevitably lead. He argues that this is a consequence of perceiving learning in quantitative terms, ie 'how much' rather than the quality of understanding:

> "Learning..is centrally about qualitative changes in how people interpret subject content. When student achievement is de facto measured in terms of reproducing facts or implementing procedures and formulae, an operational definition of what it means to be

> highly competent in a subject area is consequently provided. This definition is readily learned by students, and leads them to adopt strategies at variance with teachers' aims.
> (Ramsden, 1988, p.25)

According to Marton and Ramsden (1988), a central pedagogic intervention would be to change assessment proceedures in higher education to an emphasis on understanding rather than reproduction. Another method is to directly address students' conceptions of learning by emphasising students' awareness of the act of learning in relation to a specfic content. This places precedence on <u>why</u> a method is used as opposed to <u>how</u> it is used. Traditional study skill programmes which divorce skill from content and place emphasis on 'doing' rather than 'knowing' thus become inappropriate. The failure of content-independent technicist study skills programmes to make significant improvements in university performance is well documented (Gibbs, 1981; Lafitte, 1963; Maddox, 1963; Svensson, 1978; Selmes, 1978).

The implications for compensatory academic support programmes is that intervention thus needs to be multi-faceted engaging teaching and assessments methods (demand characteristics), students awareness of learning (metacognition) and the strategies they employ when approaching material to be learnt (process/content). The content of the programmes should also deal with actual university learning material rather than focusing on content-independent technicist skills such as memorising nonsense syllabiles, examining the table of contents or solving nonsense syllogisms.

6.8 LIMITATIONS OF PRESENT STUDY AND FUTURE RESEARCH

Although this study has found a link between student learning strategies and academic success, the classification of learning strategies is not ideal in that there are many possible ways in which students can perceive the instruction to 'summarise' the material. The problem with this method is that students may not have responded to the instruction in terms of the habitual strategy they use when confronted with learning material. This implies that more indicators of learning strategies need to be developed perhaps along the line of structured interviews; though this could lengthen the selection procedure considerably.

A limitation was found in the criterion variable 'average mark obtained', as it did not reflect the amount of courses from which it was comprised. Future studies could develop an indicator of the course discard rate which would make this a more refined measure. In addition, the low incidence of holists in the study is not what one would want for predictive research and therefore the results generally need to be treated with caution.

The classification of learning strategies requires a high degree of skill and familiarity with the theoretical constructs underlying the classification. Thus extensive training would be necessary in order to make this a general selection procedure.

Finally the study was of necessity limited to white students in the faculty of Arts; future research should focus on extending learning strategies research in different faculties and on disavantaged students.

An example of work which has attempted to address process factors in tertiary academic learning in science faculties is that of West & Pines (1985). West & Pines have marked out a research paradigm consistent with this study in that the emphasis is on:

> " the shift to cognitive psychology with its interest in the learner-in-process-of learning- .... and the methodological shift towards qualitative studies."
> (West & Pines, 1985, p.1)

Thus the stress is on conceptual understanding rather than isolated skills:

> " We are emphasising the learning of a coherent body of knowledge, not as discrete concepts, skills and so forth, but as a related set." (p.2)

Work by Champagne, Gunstone & klopfer (1985) demonstrate a congruence with the atomist vs holist dimension whereby they analyse differences between expert and novice physicists and conclude that differences in knowledge occur in the level of abstraction, accuracy and structure. These are precisely dimensions on which holists and atomists differ. Head & Sutton (1985) on the other hand point out that the need to acquire knowledge 'quickly' or under pressure may lead to atomist type processing in science.

> "A full understanding often cannot be achieved quickly, so if the idea is grasped at all, it will usually be through rote learning. The idea is then not part of the individuals repertoire of general sense making beliefs about the world; it will merely be a context-bound formula to apply in a given situation." (Head & Sutton, 1985, p.95)

This suggests that the test situation with its intrinsic time constraints may have contributed to some extent to the large proportion of atomist type processors found in this study.

Pines (1985) directs science and physics educational researchers to examining the process by which humans acquire knowledge through conceptual relations; particularly the 'set-subset' and the 'whole-part' relationships. This corresponds to the holist dimension where an attempt is made to transform, abstract, and restructure learnt material.

Sheull (1985) picks up on the process whereby traditional teaching and assessment methods direct and reinforce student approaches to learning, by stating that:

> "Students enter a classroom with preexisting conceptions that determine how the institutional material and events encountered in the classroom are interpreted. (Shuell, 1985, p.127)

Thus a vital area for future research should be aimed at identifying ways in which atomist processors could be influenced to become holist

processors. Biggs (1988) suggests some ways in which this might be approached. The first method he suggests is to actively discourage surface approaches to learning.

> "Certain practises, relating particularly but not exclusively to assessment and workload, induce students to bargain for minimal involvement, thereby committing themselves to a surface approach. Teachers seem frequently unaware of this affect: it invites self-exploration by teachers individually and in in-service workshops. (Biggs, 1988, p.135)

The second method involves actively encouraging deep (holistic) approaches to learning by promoting guided self-questioning, using other students as a resource in small groups and finally using the teacher as a role model to demonstrate effective holist learning strategies. Finally he suggests developing an 'achieving approach'. He sees this approach as utilising study skills but with a fundamental difference to 'technicist approaches' in that students need to reflect on and understand the purpose and process underlying the use of these skills.

> "The present results show that teaching study skills can be fruitful as long as it is done in a metacognitive context. The target is the achieving approach with self-management of students' learning and study contexts, while alerting students towards a meaning orientation." (Biggs, 1988, p.136)

6.9 *CONCLUSIONS*

This study has successfully extended the learning processing paradigm into tertiary academic prediction by establishing a relationship between learning strategies and academic performance.

The notion that there is a relationship between traditional intellectual tests and academic success has been brought into question by the findings of this study. Furthermore, it has shown that traditional and culture-fair approaches to intelligence and academic prediction have generally been unsuccessful. It was argued that this was because these approaches have been explicitly and implicitly predicted on static and immutable conceptions of intelligence or 'g' which have confined researchers into a narrow paradigm which excludes examining the processes underlying ability or performance. In addition it was argued that the use of these tests have little or no relevance for selection in higher education as they do not elucidate the processes intrinsic to success at university.

It has been shown that current research trends have found school results to be the single best predictor of academic success but that the majority of variance essentially remains unexplained. In addition, the literature has been shown that school results do not predict for black students in South Africa and consequently there is an urgent need to find predictors that are relevant to both advantaged and disadvantaged communities. The results of the present study suggest that learning strategies may provide some of the solutions to this dilemma.

It has been shown that learning strategies can contribute to an understanding of the constituents of sucess while simultaneously establishing predictive validity. Thus allowing selection, remediation and teaching to be on a continuum rather than three seperate and discrete categories.

Finally it should be borne in mind that while attempts at prediction will never be able to account for all the variance in academic success it is crucial to eliminate as many false negatives as possible in the selection process. It is felt that learning strategies can contribute substantially to this goal.

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APPENDIX A

TEST ADMINSTRATORS' INSTRUCTIONS FOR THE DEDUCTIVE REASONING TEST

INSTRUCTIONS

In this test you will be asked to solve a number of syllogisms. A syllogism consists of two simple statements from which it is possible to infer a conclusion.

Here is an example of a syllogism:

Statement 1: All snakes are reptiles
Statement 2: All cobras are snakes
Therefore: All cobras are reptiles

Note that in solving a syllogism one cannot always rely on common sense. Sometimes the rules of logic produce conclusions which do not sound right to us.

For example:

All metals are malleable
Some metals are liquids
Therefore: Some liquids are malleable

It is also possible to infer a logically correct conclusion from two completely senseless statements.

For example:

Some spoons are plates
All plates are knives
Therefore: Some knives are spoons

This is a test of your ability to deduce **logically correct** conclusions from given statements. Items in the test will include syllogisms similar to each of the three types outlined in the examples above. Do not concern yourself with whether the statements are factually correct. The test items appear in this booklet. You are to record your answers on the separate answer sheet. Please do not make any marks in the test booklet.

Each item consists of two statements followed by five possible conclusions. Only one conclusion is correct. Your task is to examine each pair of statements and then decide which of the five given conclusions can be logically deduced from the information given in the statements. Record your answer on the separate answer sheet by making a dark cross over the letter corresponding to your choice.

Make sure that the conclusion you select is the best, or logically "strongest" conclusion which can be correctly deduced from the information given in the two statements.

For example, if two of the five possible conclusions given for a particular item are:

All men are mortal and
Some men are mortal

both of which follow from the information given in the two statements, only the "stronger" conclusion, namely **All men are mortal** is correct.

In some cases, however, the information given in the two statements may be such that **only** the "weaker" conclusion, in this case, **Some men are mortal** can be logically deduced. In such cases the weaker conclusion is correct.

A similar rule holds in the case of negative conclusions. For instance two of the five possible conclusions given for a particular item might be:

No men are immortal and
Some men are **not** immortal

If both these conclusions follow from the information given in the two statements, the "stronger" conclusion **No men are immortal** is correct. Again, if the information permits **only** the deduction of a "weaker" conclusion such as **Some men are not immortal** this conclusion will be correct.

Note:

In everyday usage the meaning of the word **some** is very ambiguous. For the purpose of this test **some** should be taken to mean, **at least** 1, or possibly 2, 3, 4 5 . . . **all.** In other words some means an indeterminate positive number ranging from **one** to **all.** All has therefore a more specific meaning than **some** and is for this reason **stronger.**

There are 36 items and you will be allowed 45 minutes in which to complete the test. Work quickly and carefully, but do not spend too much time on a particular item If you are unable to answer an item go on to the next one. You can return to any item left out if there is time at the end of the test.

Remember to mark only one conclusion for each item.

Are there any questions?

DO NOT TURN OVER UNTIL YOU ARE TOLD TO DO SO.

APPENDIX B

SAMPLE OF ITEMS FROM THE DEDUCTIVE REASONING TEST

9 No humans are wicked
Some thieves are wicked
Therefore:

O Some humans are not thieves
P All wicked individuals are thieves
Q Some thieves are not humans
R Some humans are not wicked
S Some wicked individuals are not humans

10 Some cauliflowers are round
All round things are policemen
Therefore:

T Some round objects are policemen
U Some policemen are cauliflowers
V Some policemen are not cauliflowers
W All cauliflowers are policemen
X Some round objects are cauliflowers

11 All homes are family units
No family units are houses
Therefore:

Y No houses are family units
Z Some homes are not houses
A No houses are homes
B Some homes are houses
C Some houses are not family units

12 No ditchdiggers are mudbaths
Some ditchdiggers are millionaires
Therefore

D Not all mudbaths are millionaires
E Some millionaires are not mudbaths
F Some mudbaths are ditchdiggers
G Some mudbaths are millionaires
H Some millionaires are mudbaths

APPENDIX C

LEARNING STRATEGIES READING EXERCISE AND QUESTIONS

1. READING EXERCISE

OBESITY

Obesity is a major problem, and millions of rands are spent each year on special diets, drugs, or other treatments by those seeking to lose weight. Most people are not very successful in losing weight; and those who do succeed in shedding kilograms almost invariably regain them.

A popular view is that obesity stems from unresolved emotional problems - fat people were starved for love as children and food symbolizes "mother's love", or, overeating is a substitute for other satisfactions lacking in the individual's life. While such explanations may be appropriate for some cases, most overweight people have backgrounds that are no more psychologically disturbed than those of normal-weight individuals. Fat people are often unhappy, but their distress is primarily a result, rather than a cause, of obesity. In a society where thinness is equated with beauty overweight people tend to be embarrassed by their appearance and ashamed of their supposed lack of control.

Research so far has failed to discover a single personality type that characterizes all obese people. Rather than focusing on the individual's personality or emotional background, current studies of obesity look at the situational factors that lead to overeating. What cues(both internal and external)prompt a person to eat? How do obese people differ in their responses to these cues?

EATING IN RESPONSE TO EXTERNAL CUES

The sight, aroma, and taste of food often affect how much we eat and when we eat. Research suggests that obeses individuals may be more responsive to these food cues than people of normal weight.

In one study, obese and normal-weight individuals were allowed to have all they wanted of a nutritious but mild-tasting liquid diet. Over a period of three weeks, obese subjects gradually diminished their intake to an average of only 500 calories a day. Normal-weight subjects consumed slightly fewer calories initially, but thereafter returned to an average of 2,000 calories per day (Nasim and Van Itallie, 1965). Taste seems to be particularly important to overweight subjects. Of course, the obese subjects were more motivated to lose weight than the normal subjects, but they had been unable to restrict their intake at home or on a clinic diet of regular food.

Obese individuals also seem to be particularly responsive to the sight of food. For example, when bright lights are focused on a dish of cashew nuts, they eat twice as many nuts as they do when the lights are dimmed. People of normal weight eat about the same number of nuts, regardless of how well they can see them (Ross, 1974). Even listening to a mouth-watering description of food prompts overweight individuals to eat far more than normal-weight individuals under the same conditions (Rodin 1974). The evidence from these various studies indicates that the eating behaviour of obese individuals seems to be very dependent on food cues.

Another external cue for eating is the passage of time. Most of us assume that when four to six hours have passed it is time for the next meal. Do obese people differ from those of normal weight in their eating response to temporal cues? How is eating behaviour affected when apparent elapsed time differs from actual elapsed time?

In a laboratory study designed to answer these questions, two clocks were rigged so that one ran at half the normal speed and the other ran at about twice normal speed. The subjects were college students, half with an average weight 31 percent above normal and half whose weights averaged only 2 percent above normal. They were told that the study was an investigation of the relation between certain physiological measures(heart rate and GSR) and performance on psychological tests. Each subject arrived at the laboratory at 5.00 pm. The experimenter removed the subject's watch so electrodes could be placed on his or her wrist and left the subject alone in a windowless room containing only the recording equipment and either a fast or slow clock. When the experimenter returned to the room 30 minutes later (5.30), the slow clock read 5.20; the fast one 6.05. The experimenter was nibbling from a box of crackers. He put the box down, inviting the subject to have some. He then left the subject alone with the box of crackers to complete a self-administered personality test. The only datum actually recorded was the weight of the box of crackers before and after the subject had a chance to eat from it.

Figure 1 shows the amount of crackers eaten by obese and normal subjects for each time condition. The eating behaviour of both the obese and normal subjects is affected by time cues, but in opposite directions; the obese individuals who thought it was 6.05, and time to eat, ate significantly more than those who thought it was 5.20, and not yet dinner time. The normal subjects either did not increase their intake when they believed it was 6.05 or actually ate less because they did not want to spoil their dinner. Again, we see that for obese individuals, eating is very much influenced by external cues.

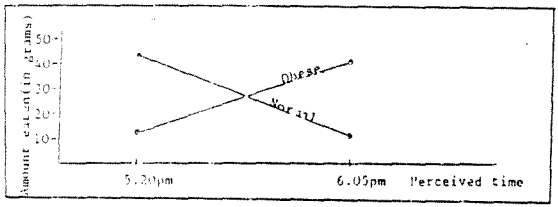

FIG.1 EATING BEHAVIOUR AND PERCEIVED TIME

Actual time for all groups is 5.35. Obese subjects consume more when they believe it is close to supper time, while normal subjects eat less. (After Schachter and Gross, 1968).

EATING IN RESPONSE TO INTERNAL CUES

Overweight individuals often report that they tend to eat more when they are tense or anxious. And experiments suggest that this is true. For example, obese subjects ate more cookies in a situation where they were made to feel quite anxious than they did in a low-anxiety situation. Normal-weight subjects ate more in the low-anxiety situation(McKenna, 1972).

Any kind of emotional arousal seems to increase food intake for some obese people. In one study, overweight and normal-weight subjects saw four films at four different sessions. Three of the films aroused various emotions; one was distressing, one amusing, and one sexually arousing. The fourth film was a boring travelogue. After viewing the films, the subjects were asked to evaluate different kinds of crackers. The obese subjects ate significantly more crackers after viewing any of the arousing films than after seeing the travelogue. Normal-weight individuals ate the same amount, regardless of which film they had seen(White, 1977).

The tendency of obese people to eat more when emotionally aroused suggests the possibility that they may be less sensitive to the internal cues of hunger than are persons of normal weight. They may be unable to discriminate between hunger and other states of physiological arousal; thus, they may eat whenever they are tense, excited, or hungry.

Initial studies reported that normal-weight subjects associated feelings of hunger with stomach contractions much more often than obese subjects - thus supporting the hypothesis that obese individuals are less sensitive to internal hunger cues(e.g. Stunkard, 1959; Stunkard and Kock, 1964). However, recent studies using more sensitive measuring instruments and more refined methods of self-reporting found that only a minority of either obese or normal subjects showed a strong association between stomach contractions and intensity of hunger. Most of us, whether fat or thin, are not very good at interpreting what our stomach tells us(Stunkard and Fox, 1971).

RESTRAINED AND UNRESTRAINED EATERS

The studies we have examined suggest that obese people tend to be more responsive than normal-weight individuals to such external cues as mealtime and the sensation aroused by food. They are also more apt to eat when emotionally aroused. But one variable we have not considered is that overweight individuals are more likely to be dieting than thin or normal weight individuals. Some of their responsiveness to external cues may stem from the fact that they are dieting. People who are hungry all the time might be expected to pay more attention to food.

To test this possibility, a questionnaire was developed that asked about diet and weight history(for example, "How often are you dieting?" or "What is the maximum amount of weight that you have ever lost in a month?") as well as concern with food and eating(for example, "Do you eat sensibly before others, and make up for it alone?" or "Do you have feelings of guilt after overeating?").

The result showed that almost everyone - thin, plump or fat - could be classified into two types: those who consciously restrain their eating and those who do not (Herman and Mack, 1975). In addition, no matter what their actual weight, "restrained eaters" behave more like obese individuals than "unrestrained eaters". For example, if normal-weight subjects are placed in an anxiety-producing situation, those who are classed as restrained tend to increase their food intake (like the obese), whereas the unrestained eaters tend to eat less.

The control of the dieter is fairly tenuous, however, and is vulnerable to many external influences - as anyone who has repeatedly broken a diet knows. Dieting may actually increase the chances of overeating. In one study, restrained and unrestrained eaters (of normal weight) were required to drink one or two milkshakes or none. They then sampled several flavours of ice-cream and were encouraged to eat as much as they wanted. The more milkshakes the unrestrained eaters drank, the less ice-cream they consumed later. The restrained eaters, in contrast, ate more ice-cream after they had drunk two milkshakes than after one or none. Apparently, once the restrained group had overeaten, their control broke down completely (Herman and Mack, 1975).

TIMED READING (4 MINUTES) REACHED LINE NUMBER [ ]

INSTRUCTIONS

Now go back and study the article as you usually prepare for a test or examination. Feel free to underline or make marks on the article. If you want to make notes or write comments, you can do so on the article or on the separate sheet of note paper. You have 20 minutes in which to prepare for questions on the text.

STOP! PLEASE DO NOT TURN THE PAGE.

Author Culverwell David
Name of thesis Learning Strategies And Academic Success Of Undergraduate Arts Students. 1989

PUBLISHER:
University of the Witwatersrand, Johannesburg
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