Teacher Perceptions, Learned Helplessness and Mathematics Achievement:
A Longitudinal Study

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As part of a longitudinal study of mathematics achievement, 58 teachers in 31 schools rated the classroom behaviour and mathematics achievement of 258 primary and lower secondary South Australian students. The Student Behavior Checklist, used by the teachers had been designed to measure learned helplessness and mastery behaviours in the classroom, but confirmatory factor analysis indicated a single scale of academic behaviour. This Academic Behaviour scale was analysed with the Rasch model and the results of the teachers' ratings compared with the students' scores on the Progressive Achievement Test in Mathematics one year later. In addition, students' task involvement, ego orientation, explanatory style and depression were assessed via self-report instruments. It was found that teachers' ratings of achievement in mathematics were predictive of subsequent achievement in mathematics, but their ratings of academic behaviour failed to predict significantly the students' responses on the self-report scales. However, the relationship between the Academic Behaviour scale and students' self-reported depression was of a small but marginally significant order of magnitude.

Introduction

To what extent can teachers identify students with the disposition to exhibit learned helplessness? Helplessness is often defined by the use of student self report indices such as the Intellectual Achievement Responsibility Scale (IAR; Crandall, Katovsky & Crandall, 1965), by various attributional-type line scales or by the Children's Attributional Style Questionnaire (CASQ; Seligman, Peterson, Kaslow, Tannenbaum, Alloy, & Abramson, 1984). Although the concept of learned helplessness now has a long history in psychology, there appears to be no recognized measure of this trait in terms of teachers' perceptions and judgements. In the current project, the use of a teacher-rating instrument that emerged from the work of Fincham, Hokoda and Sanders (1989) was investigated.

As part of a longitudinal investigation into motivational variables likely to influence primary and lower secondary students' mathematics achievement, teachers rated the behavioural characteristics of students in the classroom as well as their achievement in mathematics. These measures of academic helplessness and achievement, as perceived by teachers, were compared with student achievement data and motivational indices one year later. The area of mathematics was chosen in part
because it is an area of the curriculum where students hold strong attitudes and where success and failure are more obvious (McLeod, 1993).

Learned Helplessness

Helplessness is described by Peterson, Maier and Seligman (1992) in terms of three criteria: (1) loss of motivation, (2) changes in cognition and emotion, and (3) a reduction in behavioural agency (such as passivity). Among the changes in cognition is the perception of non-contingency; that is, the belief that important outcomes are uncontrollable. As helplessness in children has been predominantly measured by pencil and paper self-report, the available research has largely used students in the fifth grade or higher. It has been widely assumed that the Children’s Attributional Style Questionnaire is predictive of learned helplessness (Nolen-Hoeksema, Gigrus & Seligman, 1986; 1992).

In classroom contexts it is likely that helplessness is observed through the way students respond to situations of actual or conceivable failure. It may be thus assumed that teachers are in a position to assess at least some of the recognized dimensions of helplessness as they surface in classroom life.

The Student Behavior Checklist

In developing the Student Behavior Checklist that was used in this
study, Fincham et al. (1989) generated items that reflected the range of behaviours associated with learned helplessness and mastery orientation in the research literature. Thus, by their very nature the items reflect student characteristics that are directly observable by teachers, rather than being inferred from an internal state as measured in student self reports. Fincham et al. (1989) reported that although the learned helplessness and mastery orientation subscales were highly correlated ($r = -0.81$) the psychometric robustness of the instrument had yet to be established. Furthermore they raised the issue as to whether the scales specifically measured learned helplessness and mastery orientation or whether they reflected academic competence. Lastly, they considered that as the scale was strongly related to concurrent and future achievement scores in their own study and that of Nolen-Hoeksema, Girgus and Seligman (1986), perhaps a shorter version of the scale might "provide a cost-effective measure of helplessness" (Fincham et al., 1989, p 143).

Teacher Judgement

Classroom behaviour

In a critical review of teacher-administered rating scales of the classroom behaviour of children Spivack and Swift (1973) noted the importance of ascertaining student behavioural adjustment in the classroom not only from a behavioural management point of view but also because it reflected "the extent to which the child may be benefiting from participation in the educational enterprise itself" (Spivack &
Swift, 1973, p55). In reviewing the literature of the time they found 19 studies in which teachers had rated overt behaviours, and in most of these there was both a paucity of classroom behaviours covered and a marked lack of psychometric rigour in the scales themselves. With respect to teachers as judges, they reported that teacher ratings discriminated between a variety of criteria, had some stability over time, and that teachers' ratings of girls' overt behaviour were more consistent with their actual performance than was the case for boys. It was considered that the study of overt student behaviour by teachers supplied a new dimension to the understanding of classroom behaviour and school achievement.

**Academic performance**

Hoge and Coladarci (1989) located 16 studies in which teachers' judgements of their students' academic performance were compared against actual scores on objective test measures. Across the studies the median correlation was 0.66 suggesting a strong correspondence between teacher judgements and student achievement. The data from several studies suggested that teachers achieved a 'hit-rate' of around 70 per cent accuracy when asked to assess whether individual students were able to succeed on specific test items. In a review of 42 studies, Follman (1990) found the best estimate of the correlation between teachers' estimates of students' achievement and their actual scores on standardized achievement tests to be 0.50, although the correlations ranged from about 0.10 to 0.90.
When the judgements of teachers were compared, Hoge and Coladarci (1989) noted that a number of studies indicated large variations amongst individual teachers. Moreover, they reported that the accuracy of teacher judgements appeared to be relatively higher in the case of judgements made on average to above average ability students. Teacher ratings of academic brightness have been found to be significantly correlated with examination success five years later (Kenealy, Frude & Shaw, 1991).

Teachers' perceptions might be influenced by a variety of student characteristics and these expectations might in turn affect classroom interactions. High achievers in the third grade were rated as having better meta-cognition, higher self concept and stronger effort and ability attributions about success (Carr & Kurtz, 1991; Carr & Kurtz-Coates, 1994). Interestingly, in the latter study teachers were moderately accurate in their perceptions of students' metacognitive abilities, but not of their attributional beliefs or self concepts (Carr & Kurtz-Coates, 1994). Physically attractive students were judged more favorably by teachers (Ritts, Patterson & Tubbs, 1992), while students for whom the teachers held high performance expectations in physical education received significantly higher academic learning time (Cousineau & Luke, 1990). When average achieving students were assigned to advanced mathematics classes in an urban American junior high school, they not only received higher level mathematical content and active teaching, but they also achieved at a higher than expected level (Mason, Schroeter, Combs & Washington, 1992).
The effect of teacher expectations on student performance has been termed a self-fulfilling prophecy (Rosenthal & Jacobsen, 1968), a term originally employed by Merton (1948) to refer to situations in which initially false beliefs became true. While this phenomenon was believed to be powerful and pervasive through the 1980s, neither meta-analyses of the experimental research (such as Raudenbush, 1984; Rosenthal & Rubin, 1978) nor naturalistic studies (see Brophy, 1983; Jussim & Eccles, 1995a, for reviews) supported this conclusion although, under some conditions, self-fulfilling prophecies were more powerful. In a longitudinal study of the effect of this phenomenon in mathematics, teachers’ expectations predicted changes in student achievement beyond effects accounted for by previous achievement and motivation (Jussim & Eccles, 1992), although their perceptions predicted achievement more strongly for low achievers than high achievers (Madon, Jussim & Eccles, 1997).

The overall conclusion of the Hoge and Coladarci (1989) review was that, with regard to the achievement domain, teacher judgements did concur with more objective measures. However, some teachers tended to be more accurate than others and there was a tendency for teachers to err in over-estimating the capabilities of low-achieving students.

Teacher grading

In a review of 19 studies of teacher grading over the last ten years, Brookhart (1994) also noted variability in teacher practices. Different
teachers not only perceived the meaning and purposes of grades differently, but considered achievement and nonachievement factors differently (Brookhart, 1993; Frary, Cross & Weber, 1993; Nava & Lloyd, 1992; Pilcher-Carlton & Oosterhof, 1993). Primary teachers relied more on observation and informal evidence while secondary teachers depended more on written evidence when grading (Brookhart, 1994).

With respect to achievement and nonachievement factors, Brookhart noted the confounding effect of effort and achievement on teachers' grading. When grading students' work, teachers see effort as a separate issue from considering students' gender or personality (Frary et al., 1993; Griswold & Griswold, 1992; Nava & Lloyd, 1992; Pilcher-Carlton & Oosterhof, 1993; Stiggins, Frisbie & Griswold, 1989; Wood, Bennett, Wood & Bennett, 1990). These comments are important as the characteristics of learned helplessness include passivity, loss of motivation and lack of effort, behaviours which in turn impact on academic achievement. If students do not participate in the activities and lessons provided by the teachers, then their achievement is jeopardised (Brookhart, 1994).

The Present Study

The extent to which teachers' judgements of student emotional and motivational traits reflect the high level of accuracy that is apparent within the achievement domain is of course open to question. Knowledge
of this area has been hampered by lack of suitable measurement instruments. Thus the present study sought to investigate properties of the Student Behavior Checklist (Fincham, Hokoda & Sanders, 1989), and the extent to which this scale taps into teachers' perceptions of learned helplessness in the classroom, and the relationship between their ratings and subsequent student motivation and achievement. This scale was chosen for investigation because of its importance in the literature in investigations of student achievement and explanatory style (Nolen-Hoeksema, Girgs & Seligman, 1986).

Subjects

In November, 1994, 58 teachers in 31 schools in an Australian city rated 258 students from Years 4 to 8 with the Student Behavior Checklist. Of these students, the 243 in the final sample were located in 26 primary and 24 lower secondary schools in Term 4, 1995, where they were administered a test of mathematics achievement, and questionnaires of explanatory style, depression and attitudes towards mathematics. The distribution of these students by year level and gender in 1995 is presented in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Gender</th>
<th>Year 5</th>
<th>Year 6</th>
<th>Year 7</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Total N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>8</td>
<td>28</td>
<td>21</td>
<td>28</td>
<td>24</td>
<td>109</td>
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<tr>
<td>Female</td>
<td>10</td>
<td>34</td>
<td>22</td>
<td>38</td>
<td>30</td>
<td>134</td>
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</tbody>
</table>
Instruments

1. Student Behavior Checklist

The Student Behavior Checklist (Fincham, Hokoda & Sanders, 1989) designed as a rating scale for teachers is comprised of 24 items, 12 of which had been selected from the research literature to measure the construct of learned helplessness, while the other 12 were designed to measure mastery orientation. An example of an item measuring learned helplessness is "Prefers to do easy problems rather than hard". An example of an item measuring mastery orientation is "Tries to finish assignments even when they are difficult". The teachers were asked to rate student behaviour over the past two to three months on a five point scale ranging from 1 (not true) to 5 (very true). They also provided a single estimate of student achievement in mathematics on a five point scale which ranged from 1 (excellent) through 3 (average) to 5 (poor).

2. Progressive Achievement Tests in Mathematics

The Progressive Achievement Tests in Mathematics (ACER, 1984), which utilises a multiple choice format, consists of three tests (Tests 1, 2, and 3) at different grade levels and different levels of difficulty,
with each covering a range of general mathematics topics. Form A of
each test was used. Within each test, the items are arranged in order
of increasing difficulty in content groups. The item difficulty order
was determined by the Rasch analysis of the responses from the
Australian standardization sample tested in November, 1983.

Test 1 designated for Years 3, 4, and 5 contains 47 items, encompassing
number, computation, fractions, measurement and money, statistics and
graphs and spatial relations. Test 2 with 57 items covers the areas of
number, computation, fractions, measurement and money, statistics and
graphs, spatial relations and logic and sets and is designed for use in
Grades 5, 6, 7, and 8. Test 3, intended for Grades 6, 7, and 8,
contains 55 items measuring the same areas except fractions. Initial
concerns that there might have been a ceiling effect for some students
in Year 9 were allayed by consultation with Heads of Mathematics
Departments in some of the participating secondary schools who
considered that curricular changes after 1984 made the items still
relevant for students at this level.

In the Rasch calibration procedure, the items in the tests were
analysed with the Rasch model calibration program BICAL3, with a
common-items equating procedure enabling the preparation of a scale
score equivalence table from the item difficulty estimates (ACER,
1984). It is possible to equate the results from Tests 1, 2 and 3 for
all year levels and place the students' scores on a single scale of
achievement. These Rasch scaled scores locate students' performance on
either of the sets of tests on the same single common scale of mathematics achievement irrespective of the level of the test and the time of the school year at which students took the test. Students' raw scores on the two tests were therefore converted to Rasch scaled scores by reference to the relevant conversion tables provided in the Teachers Handbook.

3 Your Feelings in Mathematics: A Questionnaire

Your Feelings in Mathematics: A Questionnaire (Yates, Yates & Lippett, 1995), is designed specifically for this study to measure the task involvement and ego orientation dimensions of goal orientation beliefs in mathematics. It is an adaptation of the Motivation Orientation Scales (Nicholls, Cobb, Wood, Yackel, & Patashnick; Duda and Nicholls, 1992). Fifteen of the 25 items measure task involvement, six items measure ego orientation, with the remaining four designated as filler items.

Students are asked to rate their attitudes towards mathematics on a five point Likert-type scale ranging from a strong yes to a strong no. Items are coded from 1 to 5 with a 5 being allocated for a strong yes through to a 1 for a strong no. Each item commences with the stem "Do you really feel pleased in maths when ... " which is then followed by a statement that relates to student mathematics behaviour. The students then circle the rating that most closely approximates their feeling about the situation presented in the item.
4 The Children's Attributional Style Questionnaire

The Children's Attributional Style Questionnaire (CASQ), (Seligman, Peterson, Kaslow, Tanenbaum, Alloy, & Abramson, 1984), a forced choice pencil and paper instrument, consists of 48 items of hypothetically good or bad events involving the child, followed by two possible explanations (Seligman et al., 1984). For each event, one of the permanent, personal or pervasive explanatory dimensions is varied while the other two are held constant. Sixteen questions pertain to each of the three dimensions, with half referring to good events and half referring to bad events. The CASQ is scored by the assignment of 1 to each internal or stable or global response, and a 0 to each external, or unstable or specific response.

Scales are commonly formed by summing the three scores across the appropriate questions for each of the three dimensions, for composite positive (CASQCP) and composite negative (CASQCN) events separately (Peterson et al., 1993). In some cases a composite total score (CASQCT) is derived by reversing the direction of the negatively scaled items (Nolen-Hoeksema, Girmus, & Seligman, 1986).

5 The Children's Depression Inventory

The Children's Depression Inventory (Kovacs, 1992), suitable for administration in either individual or group settings, was developed in 1977 as a self-rating symptom orientated scale for school-aged children and adolescents aged from 7 years to 17 years. It consists of 27 items,
covering a range of depression symptoms which include disturbed mood, hedonic capacity, vegetative functions, self-evaluation and interpersonal behaviours presented in contexts which are relevant to children. Factor analytic studies of these items found that although the CDI captured one major second-order factor of depression, five primary factors were also present (Kovacs, 1992). For this study, the questionnaire comprised 26 items, as Item 9 concerning suicide ideation, was deemed not to be appropriate for the student sample and was omitted. The questionnaire was also referred to as an Attitude Survey, since this was considered to be less anxiety provoking for students in the sample than the original title.

For each of the 26 items, students are presented with three sentences for which they are asked to rate the one that describes them best for the past two weeks by placing a cross in the appropriate box. The statements within each item present contexts with which students are likely to be familiar, with the ratings ranging from an absence of the symptom, through a mild symptom to a definite symptom. About half the items start with a choice which represents the greatest symptom severity while in the remainder of the items the sequence of choices is reversed. The items are scored as a 0 for the absence of symptom, 1 for a mild symptom, and 2 a definite symptom. While it is designed for children in the age range of 7 years to 17 years (Kovacs, 1992), some differences have been reported from the normative study in relation to the age and gender of the child, with boys and older children having significantly higher CDI scores (Finch, Saylor & Edwards, 1985).
Procedure

Teacher ratings

The Student Behavior Checklist was posted to 58 teachers in 31 different schools in Term 4, 1994. The teachers were requested to consider the student over the previous two or three months and for each of the 24 items, circle the rating from 1 to 5 that indicated how true that description was of the student. Teachers were asked to read the items carefully as they were directed towards several different aspects of the student's behaviour. Teachers also rated the student's achievement in mathematics on a five point scale. Completed questionnaires for 258 students were returned by post.

Student data

When 243 of these students were traced in 1995, the mathematics achievement test and the questionnaires were administered either individually or to groups of students in Term 4 by a male or female research assistant during normal school hours within the students' own school. Students were informed in very general terms as to the purposes of the study, with the instructions for the administration of each instrument being described to them verbally. These administrative instructions were also written on the mathematics tests and each questionnaire. At the beginning and the end of the administration session, students were assured of the confidentiality and anonymity of
their responses.

The Progressive Achievement Test in Mathematics was administered first, followed by the Children's Attributional Style Questionnaire, Your Feelings in Mathematics: A Questionnaire and the Children's Depression Inventory. Test 2 or 3 of Form A of the Progressive Achievement Test in Mathematics was administered in strict accordance with the standardization procedures on pages 5 to 7 of the Teachers Handbook, with 45 minutes plus administration time being allowed. The level of the test that was most appropriate for the year level of the student was chosen by reference to the guidelines given in the Teachers Handbook, with all students in Years 5, 6 and 7 being administered Test 2, and all students in Year 9 taking Test 3. Students in Year 8 were administered either Test 2 or 3, with the majority taking Test 2. All responses were recorded by the students with an Hb or 2b pencil on the computer scoring answer sheet.

Responses to the Children's Attributional Style Questionnaire, Your Feelings in Mathematics: A Questionnaire and the Children's Depression Inventory were recorded in pen by the students directly on the printed questionnaire sheets. If students experienced difficulty reading any of the items these were read aloud by the researcher, but no other assistance was given. The administration of the three questionnaires was not timed.
RESULTS

Calibration of the instruments

Each of the instruments and the student data were analysed with the Rasch scaling procedure. The major advantage of the Rasch model is that the students' estimated ability or attitude is independent of the sample of items, while at the same time the difficulty level of the items is not dependent on the sample of students who take the items (Wright, 1977, Wright & Stone, 1979, Hambleton, 1989). The performance of students who take different items from the same test battery can then be compared, provided that the items or students have been calibrated on a common scale (Green, 1996). Moreover, the items and the persons are brought to a common interval scale.

The item response model employs the notion of a single specified construct (Snyder & Sheehan, 1992) or an inherent latent trait dimension (Weiss & Yoes, 1991; Hambleton, 1989), which is referred to as the requirement for unidimensionality (Wolf, 1994). Prior to the use of the Rasch model, it was first necessary to determine whether each instrument met the requirement of unidimensionality (Lord, 1980; Weiss & Yoes, 1991).

The factor structure of the Student Behavior Checklist was explored by principal components analysis, and subsequently by confirmatory factor analysis. In the case of the student measures, only the structure of Your Feelings in Mathematics: A Questionnaire was considered through factor analysis. The fact that the separate tests for the Progressive
Achievement Tests in Mathematics had been brought to a common scale during the calibration and equating procedure was taken as evidence of the unidimensionality of mathematical ability that the test tapped (ACER, 1984). The items in the Children's Attributional Style Questionnaire had been designed to measure the construct of a single trait of explanatory style while unidimensionality had been specifically examined through the use of oblimin rotation factor analytic procedures in the construction of the Children's Depression Inventory.

In the analysis of each of the instruments, the infit mean square values of each item were inspected to determine whether they fell within the predetermined range of 0.83 and 1.20. For each instrument, items with infit mean square values within this range were considered to fit the Rasch model and were thus retained, while those outside this range which did not fit the model were progressively deleted. Items which misfitted were discarded because they represented a different construct, were ambiguous, discriminated so well as to be redundant with other items or did not discriminate well (Green, 1996). The final scales were composed of those items that met the requirements of the Rasch model.

With the exception of the Progressive Achievement Tests in Mathematics (ACER, 1984) which had been Rasch analysed with the BICAL3 program, the QUEST program (Adams & Khoo, 1993) was used for Rasch scaling of all of the instruments.
Calibration of the Student Behavior Checklist

1. Confirmatory Factor Analyses

Unidimensionality of the items in the Student Behaviour Checklist was established with confirmatory factor analysis of a one factor, two factor, hierarchical and nested model through the use of the LISREL8W computer program (Joreskog and Sorbom, 1993). Acceptance of the one factor model indicated that there was no evidence to support the two separate factors Learned Helplessness and Mastery which were hypothesised by Fincham, Hokoda and Sanders (1989) in the development of the instrument (Yates and Afrassa, 1995). As a consequence of these analyses, it was evident that the items in the Student Behaviour Checklist measured only one factor Academic Behaviour.

2 Principal components factor analysis

Exploratory principal components factor analysis using the SPSS computer program was carried out to examine the factor loadings on Learned Helplessness and Mastery. All the Mastery items had negative factor loadings while all the Learned Helplessness items were positively loaded. As the Mastery and Learned Helplessness items loaded in opposite directions, the results from both the principal components and confirmatory factor analyses indicated that it was necessary to reverse the Learned Helplessness items responses from (01234) to
3 Rasch Analyses

The Rasch rating scale procedure was selected, because it involved "a single underlying dimension for academic behaviour and sought to scale the data in such a way that interval scale data were obtained for the variable formed" (Wolf, 1994, 4926). The responses however, also involved unipolar scales with the same response categories across all items. Rating scale analysis was the preferred technique for the analysis of these response categories (Wolf, 1994).

Of the 24 items analysed with the QUEST computer program (Adams & Khoo, 1993), 14 items had infit mean squares outside the acceptable range of 0.83 to 1.20. These misfitting items were progressively deleted from the scale (Yates and Afrassa, 1995). Of the ten remaining items that fitted the Rasch scale, six were learned helplessness items (LH) and four were mastery items (MO) (see Table 2). The items in the final scale related to effort (items 1 (LH) and 13 (MO)), motivation (items 4 (LH) and 7 (MO)), reaction to failure (items 6 (LH), 9 (LH) and 24 (MO)), persistence (items 20 (LH) and 22(MO)), and response to teacher inquiry (item 18 (LH)).

Rasch scaled teacher ratings were estimated for each student on the basis of these ten items of academic behaviour. A separate score for each student was recorded from the single rating of achievement made by
their teachers. This is referred to as the 1994 teacher rating of maths achievement.

Table 2
The Academic Behaviour Scale

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Learned Helplessness items (LH)</th>
<th>Mastery Oriented items (MO)</th>
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<tbody>
<tr>
<td>Motivation</td>
<td>4. Takes little independent initiative;</td>
<td>7. Tries to finish assignments, you must help him/her to get started even when they are difficult. and keep going on an assignment.</td>
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<tr>
<td>Failure</td>
<td>6. When s/he fails one part of a task,</td>
<td>24. When s/he receives a poor grade, says s/he will try harder certain to fail at the entire task. in that subject the next time.</td>
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<tr>
<td>9. Gives up when you correct him/her or find a mistake in his/her work.</td>
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<td>Persistence</td>
<td>20. Says things like &quot;I can't do it&quot;</td>
<td>22. When experiencing difficulty</td>
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<td>21. When experiencing failure</td>
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<td>23. When experiencing non-achievement</td>
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<td>25. When experiencing lack of</td>
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<td>support</td>
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<td></td>
<td>26. When experiencing lack of</td>
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<td></td>
<td>motivation</td>
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<td></td>
<td>27. When experiencing lack of</td>
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<td></td>
<td>self-efficacy</td>
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<td>28. When experiencing lack of</td>
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<td>motivation to learn</td>
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<td>29. When experiencing lack of</td>
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<td>self-efficacy to learn</td>
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<td>30. When experiencing lack of</td>
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<td></td>
<td>motivation to improve</td>
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<td>31. When experiencing lack of</td>
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<td></td>
<td>self-efficacy to improve</td>
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<td>32. When experiencing lack of</td>
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<td>motivation to succeed</td>
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<td>33. When experiencing lack of</td>
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<td>self-efficacy to succeed</td>
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<td>34. When experiencing lack of</td>
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<td>35. When experiencing lack of</td>
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<td>36. When experiencing lack of</td>
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<td>41. When experiencing lack of</td>
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<td>self-efficacy to achieve</td>
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<td>42. When experiencing lack of</td>
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<td>motivation to reach</td>
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<td>43. When experiencing lack of</td>
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<td>self-efficacy to reach</td>
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<td>44. When experiencing lack of</td>
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<td>motivation to succeed</td>
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<td>45. When experiencing lack of</td>
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<tr>
<td></td>
<td>motivation to reach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>49. When experiencing lack of</td>
<td></td>
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<tr>
<td></td>
<td>self-efficacy to reach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>motivation to succeed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>self-efficacy to succeed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>52. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>motivation to achieve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>53. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>self-efficacy to achieve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>54. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>motivation to reach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55. When experiencing lack of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>self-efficacy to reach</td>
<td></td>
</tr>
</tbody>
</table>
when s/he has trouble with his/her s/he persists for a while
work. before asking for help.

Response to 18. Does not respond with enthusiasm
teacher inquiry and pride when asked how s/he is
doing on an academic task.

Calibration of the Progressive Achievement Tests in Mathematics

In the calibration and equating of the Progressive Achievement Tests in
Mathematics in 1983, Rasch procedures were employed for item selection,
item ordering within topic areas and in the provision of scaled scores
that enabled the students' results to be placed on a common scale
irrespective of the test, the year level of the students, the items the
students answered and the difficulty levels of these items.

Students correct responses in this study were therefore added together
and converted to the PATMATH scale scores through the use of Table 11
in the Teachers Handbook (1984, p. 34). Omitted items were considered
as wrong. The students' scores were on the same scale irrespective of
whether the they took Test 2 or Test 3.

Calibration of Your Feelings in Mathematics: A Questionnaire

1 Factor analysis of Your Feelings in Mathematics: A Questionnaire
Principal components analysis and the oblimin rotation procedure were chosen for the establishment of unidimensionality of this 25 item questionnaire as they simplified factors by minimizing cross products of loadings and allowed for a wide range of factor intercorrelations to occur (Tabachnick and Fidell, 1996). Items 2, 7, 11 and 25, designated as filler items, were deleted prior to the factor analysis. Factor one with an eigen value of 7.47 was composed of 15 items which measured Task Involvement. Factor 2, with a eigen value of 2.36 was comprised of six items that measured Ego Orientation. There was a moderate correlation of 0.40 between the two factors. On the basis of these results the questionnaire was then divided into two separate scales of Task Involvement and Ego Orientation, each of which independently met the criteria of unidimensionality for the application of the Rasch procedure.

2 Rasch Analyses of the Task Involvement and Ego Orientation scales

Each scale was then analysed separately with the QUEST program (Adams & Khoo, 1993). Of the 15 items which comprised the Task Involvement Scale, 12 items met the requirements of the Rasch model, while five of the 6 items from the Ego Orientation Scale had infit mean squares within the preset limits of 0.83 and 1.20 (Yates & Yates, 1996; Yates, 1997). The items for both scales are presented in Table 3. Rasch scaled student scores were estimated separately for the Task Involvement Scale and for the Ego Orientation Scale.
Table 3
Items in the Task Involvement and Ego Orientation Scales

Calibration of the Children's Attributional Style Questionnaire

The 24 positive items (CASQCP), the 24 negative items (CASQCN) and the composite measure (CASQCT) were analysed separately (Yates and Afrassa, 1994). The CASQCT was formed from the CASQCP and reversed CASQCN items. The results of the separate Rasch analyses of the CASQCP, CASQCN andCASQCT scales indicated that as the items on each of these scales fitted the Rasch model, the scales could be considered independently (Yates, Keeves & Afrassa, 1996). Student scores were estimated separately for the CASQCP, CASQCN and CASQCT scales.

Calibration of The Children's Depression Inventory

Of the 26 items that were administered to students, 20 met the requirements of the Rasch model. These items were used for the estimation of student scores.

Table 4
Correlations with students' achievement in mathematics

<table>
<thead>
<tr>
<th>Variable</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1995 Mathematics achievement</td>
<td>-0.40**</td>
<td>0.33**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
0.13* -0.08 -0.07

2. 1994 Teacher rating of maths achievement - -0.68**
-0.14* 0.05 -0.11

3. 1994 Teacher rating of academic behaviour -
0.08 -0.04 0.07

4. 1995 Student Task involvement
- 0.26** 0.34**

5. 1995 Student Ego orientation
- 0.09

6. 1995 Student Explanatory style (CASQCT)
-

N = 243, ** p< 0.001, * p < 0.05

Relationships between Teacher Ratings and Student Variables

The relationships between the teacher ratings of academic behaviour and mathematics achievement obtained in 1994 were examined in relation to the students' achievement in mathematics, as well as the students' task involvement in and ego orientation towards mathematics, explanatory style and self-reported depression measured one year later. Teachers' ratings of both academic behaviour and achievement were analysed with correlations and multiple regressions separately in relation to student achievement in mathematics and to depression.
The Relationship between Teachers' Ratings and Student Achievement in Mathematics

Table 4 presents the correlation between the teachers' prior ratings of mathematics achievement, ratings of academic behaviour, students' achievement in mathematics, task involvement, ego orientation and explanatory style. Significant correlations were evident between the teacher ratings of achievement and classroom behaviour and between both of these variables and student achievement one year later. Teacher ratings of achievement were also significantly correlated with subsequent student task involvement.

However, as shown in Table 5, when the predictive relationship between the teachers' ratings and achievement in mathematics were examined with direct entry multiple regression, the teachers' ratings of achievement in the previous year were found to be significant but this effect did not hold for their rating of academic behaviour within the classroom. In these analyses, students' task involvement and explanatory style was also significantly related to students' achievement in mathematics in 1995.

Table 5
Regression analysis: predicting mathematics achievement by teacher ratings, motivational orientation, and explanatory style.
<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>Beta</th>
<th>Sig</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994 Teacher rating of maths achievement</td>
<td>-0.40</td>
<td>-0.31</td>
<td>-3.92</td>
<td>0.00</td>
</tr>
<tr>
<td>1994 Teacher rating of academic behaviour</td>
<td>0.35</td>
<td>0.11</td>
<td>1.34</td>
<td>0.18</td>
</tr>
<tr>
<td>1995 Student Task involvement</td>
<td>0.13</td>
<td>0.16</td>
<td>2.43</td>
<td>0.02</td>
</tr>
<tr>
<td>1995 Student Ego orientation</td>
<td>-0.08</td>
<td>-0.08</td>
<td>-1.40</td>
<td>0.16</td>
</tr>
<tr>
<td>1995 Student explanatory style (CASQCT)</td>
<td>-0.07</td>
<td>-0.16</td>
<td>-2.57</td>
<td>0.01</td>
</tr>
</tbody>
</table>

N = 243  R = 0.45  R² = 0.20

Table 6
Regression analysis: Predicting mathematics achievement by teacher ratings, motivational orientation, and positive and negative explanatory style.

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>Beta</th>
<th>Sig</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994 Teacher rating of maths achievement</td>
<td>-0.40</td>
<td>-0.31</td>
<td>-3.92</td>
<td>0.00</td>
</tr>
<tr>
<td>1994 Teacher rating of academic behaviour</td>
<td>0.33</td>
<td>0.10</td>
<td>1.22</td>
<td>0.23</td>
</tr>
<tr>
<td>1995 Student Task involvement</td>
<td>0.13</td>
<td>0.16</td>
<td>2.54</td>
<td>0.01</td>
</tr>
<tr>
<td>1995 Student Ego orientation</td>
<td>-0.08</td>
<td>-0.08</td>
<td>-1.36</td>
<td>0.17</td>
</tr>
<tr>
<td>1995 Positive explanatory style (CASQCP)</td>
<td>-0.17</td>
<td>-0.21</td>
<td>-3.44</td>
<td>0.00</td>
</tr>
<tr>
<td>1995 Negative explanatory style (CASQCN)</td>
<td>-0.06</td>
<td>0.02</td>
<td>0.32</td>
<td>0.75</td>
</tr>
</tbody>
</table>

N = 243  R = 0.47  R² = 0.22

In order to examine the relative effects of students' positive and negative explanatory style in relation to their mathematics achievement.
in 1995, the multiple regression was repeated with the separate variables for positive and negative explanatory style in place of the total score. In the results of this analysis, presented in Table 6, it is evident that the positive explanatory style rather than the negative explanatory style is significantly predictive of achievement.

The Relationship between Teachers' Ratings and Student Depression

Table 7 presents the correlation between the teachers' ratings of achievement and academic classroom behaviour and the students' task involvement, ego orientation, explanatory style and self reported depression. There are significant correlations between the teachers' rating of both mathematics achievement and academic behaviour and the subsequent measures of students' depression, task involvement and explanatory style.

Table 8 gives the results obtained when the predictive relationship between these variables was examined with multiple regression. The teachers' prior ratings of classroom behaviour were predictive of subsequent student self-reported depression at a marginally significant level. In these results, task involvement and explanatory style were found to relate significantly to depression.

Table 7
Correlations with students' self reported depression
Table 8
Regression analysis: predicting student self reported depression in 1995 by teacher ratings, motivational orientation, and explanatory style.

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>Beta</th>
<th>t</th>
<th>Sig</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1995 self reported depression</td>
<td>0.16*</td>
<td>-0.01</td>
<td>0.36**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 1994 Teacher rating of maths achievement</td>
<td>-0.14*</td>
<td>0.05</td>
<td>0.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 1994 Teacher rating of academic behaviour</td>
<td>0.08</td>
<td>-0.04</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 1995 Student Task involvement</td>
<td>-0.26**</td>
<td>0.34**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 1995 Student Ego orientation</td>
<td>-</td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. 1995 Student Explanatory style (CASQCT)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 243, ** p< 0.001, * p < 0.05

Variable r Beta t Sig t

1994 Teacher rating of maths achievement 0.16 -0.00 -0.03 0.97
1994 Teacher rating of academic behaviour -0.18 0.15 -1.81 0.07
1995 Student Task involvement -0.28 -0.19 -2.86 0.01
1995 Student Ego orientation 0.01 0.06 0.10 0.32
1995 Student explanatory style (CASQCT) -0.36 -0.29 -4.67 0.00

N = 243 R = 0.43 R² = 0.18

Table 9 presents a correlation matrix in which the relative effects of teachers’ ratings on students' positive and negative explanatory style scores was calculated. Interestingly, while teachers’ ratings correlated with the negative explanatory style, significant correlations were also found between both the positive and negative explanatory style scales and depression.

Table 9

Correlations with students' positive and negative explanatory style and self reported depression

Variable 2 3 4 5 6 7
1. 1995 self reported depression 0.16* -0.18** -0.28** -0.01
   0.21** 0.33**
2. 1994 Tch rat. of maths ach. - -0.68** -0.14*
   0.05 -0.01 0.16*
3. 1994 Tch rat. of academic behav. - 0.08
The results of self-reported depression regressed on teachers' ratings are presented in Table 10. Their prior rating of academic behaviour was found to be a significant predictor of depression at the ten per cent level, but the rating of achievement was not significant. In it is also evident that the concurrent measure of student task involvement and
positive and negative explanatory style were also predictive, with the
negative values for the task involvement and positive explanatory style
indicative of the inverse relationship between these variables and
depression. In this regression analysis, negative explanatory style has
the strongest relationship with the concurrent measure of depression.

Table 10
Regression analysis: predicting depression by teacher ratings,
motivational orientation, and positive and negative explanatory style

<table>
<thead>
<tr>
<th>Variable</th>
<th>r</th>
<th>Beta</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994 Teacher rating of maths achievement</td>
<td>0.16</td>
<td>-0.01</td>
<td>-0.09</td>
<td>0.93</td>
</tr>
<tr>
<td>1994 Teacher rating of academic behaviour</td>
<td>-0.18</td>
<td>-0.14</td>
<td>-1.72</td>
<td>0.09</td>
</tr>
<tr>
<td>1995 Student Task involvement</td>
<td>-0.28</td>
<td>-0.18</td>
<td>-2.84</td>
<td>0.01</td>
</tr>
<tr>
<td>1995 Student Ego orientation</td>
<td>0.01</td>
<td>0.06</td>
<td>0.93</td>
<td>0.36</td>
</tr>
<tr>
<td>1995 Student positive exp style (CASQCP)</td>
<td>-0.21</td>
<td>-0.15</td>
<td>-2.38</td>
<td>0.02</td>
</tr>
<tr>
<td>1995 Student negative exp style (CASQCN)</td>
<td>0.33</td>
<td>0.26</td>
<td>4.19</td>
<td>0.00</td>
</tr>
</tbody>
</table>

N = 243 R = 0.44 R2 = 0.19

DISCUSSION

Summary of the findings

This study set out to consider teachers' perceptions of students'
learned helpless behaviours in the classroom. The following findings
emerged from the data:

1. The Student Behavior Checklist possessed acceptable psychometric properties as a short form interval scale of ten items.

2. The Student Behavior Checklist correlated ($r = 0.33 \ p < 0.001$) with achievement in mathematics one year later. However, this relationship was not predictive when the other concurrent variables were entered into the regression analysis.

3. The teachers’ single rating of student achievement in mathematics predicted mathematics achievement data one year later.

4. In general, the Student Behavior Checklist failed to predict responses to the three measures of self-reported motivation (task involvement, ego orientation, and explanatory style) used in the study. However, the relationship between the Student Behavior Checklist and depression was of a small but marginally significant order of magnitude, after controlling for other variables.

5. Levels of depression were predicted by the CASQ and by task involvement data.

Discussion of the variables

The Student Behavior Checklist

In developing the Student Behavior Checklist, Fincham et al. (1989) highlighted the need both for a shorter version of the scale and to tap teacher perceptions as a means of either supplementing or replacing student self report measures. This modified scale of ten items
certainly met the first need. However, while teachers' ratings of overt academic behaviour in the classroom did not generally predict students' internal states one year later, they were significantly related to self-reported depression.

The findings support Fincham et al.'s (1989) suggestion that the scale measures academic competence. The ten items in the Student Behavior Checklist can be conceptualised as constituting a scale of academic behaviour, with six designated learned helplessness items clearly relating to a lack of academic behaviour and the designated mastery orientation items relating to the presence of academic behaviour.

Spivak and Swift (1973) noted that when asked to rate overt behaviours teachers do discriminate between groups, with their ratings being stable over time.

Learned helplessness

When these ten acceptable items in the Student Behavior Checklist were examined, with respect to the criteria for learned helplessness suggested by Peterson et al. (1992), Item 1 clearly related to a reduction in behavioural agency, with Item 13 as its antithesis, Item 4 related to motivation with Item 7 as its antithesis, and Items 6 and 9 related to changes in cognition and emotion. This reaction to failure aspect measured in Items 6 and 9 was countered by Item 24 which measured an increase or renewal of effort in the face of failure. In addition, Item 10 related to lack of enthusiasm and pride in response to teacher inquiry. This trait has been reported by Yates et al. (1995)
as being a significant difference between pessimistic and optimistic children in relation to their reported attitudes towards mathematics.

Teacher judgments

Classroom behaviour

The variability of teacher judgements noted in the reviews of the literature by Hoge and Coladarci (1989) and Brookhart (1994) was not apparent in many of the items deleted from the Student Behavior Checklist, as these items had high discrimination indices and narrow band widths indicating that the teacher ratings on these items provided information over a very limited range (Yates & Afrassa, 1995). However, considerable variation was noted in the manner in which individual teachers furnished ratings data, with one teacher actually rating the entire class as "average" on all characteristics. This factor obviously served to reduce the magnitude of obtained relationships.

Academic performance

The correlation ($r = -0.40$, $p < 0.001$) between the teachers' single subjective rating of achievement in mathematics with the objectively
measured achievement on the Progressive Achievement in Mathematics one year later is slightly below the median estimates from the reviews of Hoge and Coladarci (1989) and Follman (1990). However, as it was unlikely that the teacher who completed the rating taught the student mathematics in the following year, their single estimate was surprisingly strongly predictive. This suggests that effort and achievement may not have been confounded in this estimate (Brookhart, 1994) and furthermore, that teachers’ expectations, as indexed by this rating, predicted achievement over time (Jussim & Eccles, 1997).

Teacher grading

The finding that teacher ratings of achievement predicted achievement independently of their ratings of classroom behaviour which was related to students’ self-reported depression supports the outcome of the review of teacher grading by Brookhart (1994). Nevertheless, this conclusion needs to be tempered by the finding that teacher rating of achievement correlated with subsequent student task involvement ($r = -0.14, p < 0.05$), particularly as task involvement was significantly related to concurrent achievement in mathematics. It may be that student behaviour influences academic learning time both in the short and long term (Cousineau & Luke, 1990). However, the extent to which teacher ratings were influenced by students’ prior achievement and task involvement has not been considered in these analyses.
CONCLUSION

Although teacher ratings were predictive of subsequent student achievement and depression, the present study does not support the notion that teachers' perceptions of student helplessness actually relate to student self-reported motivational levels. Although the Student Behavior Checklist possesses acceptable psychometric properties, there is no way of knowing if the scale actually measures "helplessness" in a manner independent of actual student achievement. Perhaps the teachers' ratings on their students' overt behaviours simply do not reflect whatever internal motivational process is occurring in students some time later. Perhaps teacher ratings of "helplessness" are not the same construct as the students' experience.

This paper reports on only a subset of a more complex design. Future reports will examine the impact of earlier achievement levels, measured two years prior to the present data set. Towards this work, path analyses are being carried out, along with the analysis of gender, year level and school site.
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I would also like to express my appreciation to the participating schools, teachers and students and indirectly the parents whose valued co-operation made the study possible.

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