In New South Wales, Australia, a longitudinal study of 3 sequential cohorts over three years (N=428, 436, 459 for cohorts 1 to 3 respectively) indicated their intended levels of participation in both Higher School Certificate (HSC) mathematics course selection and career plans, revealing a persistent gender imbalance in higher levels of participation favoring boys. Given this continued gender difference in participation, explanations were sought in students' perceptions of personal and social stereotypes about mathematics being more suited to males or females (or neither). Students rated the extent to which they themselves perceived mathematics as more suited to males or females, as well as the extent to which they perceived "society" as perceiving mathematics as more suited to males or females. In addition, students provided qualitative explanations for their ratings of personal and social gender stereotypes. Quantitative and qualitative data were collated for each gender within each cohort, and explanations thematically grouped. Despite most students' ratings favoring neither gender, stereotypes favored boys for mathematics where these occurred. Social stereotypes appeared more prevalent than personal stereotypes, perhaps reflecting cultural change and perhaps indicating a degree of "political correctness" on the part of students' reported self-perceptions. There was limited suggestion that social stereotypes are stronger for older students. The study focused on personal versus social stereotypes for boys versus girls, how these may develop and how these might contribute to the gender imbalance in mathematics participation. (Contains 5 figures, 6 tables, and 18 references.) (BT)
Exploring Perceived Personal and Social Gender Stereotypes of Maths with Secondary Students: An Explanation for Continued Gender Differences in Participation?

Watt, Helen M. G.
Exploring Perceived Personal and Social Gender Stereotypes of Maths with Secondary Students: An Explanation for Continued Gender Differences in Participation?

Helen M. G. Watt
University of Sydney
h.watt@edfac.usyd.edu.au

A longitudinal study of three sequential cohorts over three years (N=428, 436, 459 for cohorts 1 to 3 respectively) indicated their intended levels of participation in both HSC maths course selection and career plans, revealing a persistent gender imbalance in higher levels of participation favouring boys. Given this continued gender difference in participation, explanations are sought in students' perceptions of personal and social stereotypes about maths being more suited to males or females (or neither). Students rated the extent to which they themselves perceived maths as more suited to males or females, as well as the extent to which they perceived 'society' as perceiving maths as more suited to males or females. In addition, students provided qualitative explanations for their ratings of personal and social gender stereotypes. Quantitative and qualitative data were collated for each gender within each cohort, and explanations thematically grouped. Despite most students' ratings favouring neither gender, stereotypes favoured boys for maths where these occurred. Social stereotypes appeared more prevalent than personal stereotypes, perhaps reflecting cultural change and perhaps indicating a degree of 'political correctness' on the part of students' reported self-perceptions. There was limited suggestion that social stereotypes are stronger for older students. The study focuses on personal versus social stereotypes for boys versus girls, how these may develop and how these might contribute to the gender imbalance in maths participation.

Acknowledgments
Thank you to my PhD Supervisor, A/Prof Ray Debus, for his comments and support on this and other papers. Thanks also to my friend and colleague Ms Anne McMaugh for her insights and critical feedback.

It has long been a concern expressed by educators, policy makers and researchers that women are under-represented in the study of maths and in careers requiring maths (e.g., Fennema, Wolleat, Pedro, & Becker, 1981; Sherman, 1982; Willis, 1989; Leder, 1992). This study asks about the social factors that explain women's participation in maths, given that maths is a 'critical filter' (Sells, 1973) determining access to many well paid high-status careers. The importance of addressing the gender imbalance in maths participation is informed from several perspectives. A 'waste of talent' argument is often implied in the view that students should participate in maths at a level commensurate with abilities (Willis, 1989). It is also argued that mathematically talented and knowledgeable women as well as men are needed to aid the nation's technological advance (Willis, 1989). We may question expectations of equal proportions of men and women, ask about the relevance of higher level maths courses, or even suggest the over-selection of men. Regardless of the perspective taken, it is clear that the unequal participation of men and women in maths is a persistent issue.

In the State of New South Wales (NSW) in Australia, inspection of Higher School Certificate (HSC) maths course participation statistics over the past decade reveals persistent gender imbalances in these expected directions. A greater proportion of boys elect to study the highest 4- and 3-unit maths courses. Conversely, a greater proportion of girls elect the lowest Maths in Practice (MIP) and Maths in Society (MIS) maths courses (see Figure 1).

Figure 1. Gendered participation rates for HSC maths courses 1991-1999.
Explanations Beyond Maths Performance

Although recent research suggests that girls and boys approach maths problems in various ways (Fennema & Carpenter, 1998), similarities in maths performance by boys and girls make previous actual achievement an unlikely factor responsible for differential participation rates in maths. Meta-analyses have established similar mathematical performance for girls and boys. Research articles from 1967 to 1987 about maths performance by students from primary school to undergraduate university (Hyde, Fennema, & Lamon, 1990) showed negligible differences between the performance of girls and boys in overall scores (d = -0.05, favouring girls), as well as understanding of mathematical concepts (d = -0.01), computation (d = -0.14) and complex problem solving tasks (d = -0.08). Further, a meta-analysis of 98 studies from 1974 to mid-1987 (Friedman, 1989) found the 95% confidence interval for maths performance by gender covered zero. In the local situation, records of final maths examinations in New South Wales also show similar performance for boys and girls (e.g., Gagen, 1993; NSW Board of Studies).

Participants

Participants spanned grades 7 to 11 in a cohort-sequential design comprising 1323 students in mid-1997. Table 1 depicts the sample size for each cohort, the grade of participants at each year of data collection and the gender composition for each cohort. The combined sample provides information on students from grades 7 to 11, with replication of grade effects across cohorts. Participants were drawn from three upper-middle class coeducational secondary schools in northern metropolitan Sydney, matched for socioeconomic status according to the Index of Education and Occupation, based on 1991 census data (ABS, 1991).

For the present study, HSC and career maths participation data from each administration were included, however gender stereotyping data were only collected on the first occasion for each of the three cohorts, being December Year 7 for Cohort 1, February Year 7 for Cohort 2 and December Year 9 for Cohort 3. Qualitative explanations for gender stereotypes were only collected for students from Cohort 1 (see Table 1) and only on occasion 1.

Table 1

<table>
<thead>
<tr>
<th>Cohort</th>
<th>Sample Size</th>
<th>Grade and Gender Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1995 grade</td>
<td>1996 grade</td>
</tr>
<tr>
<td>Cohort 1</td>
<td>428</td>
<td>7(Dec)</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>436</td>
<td>-</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>459</td>
<td>-</td>
</tr>
</tbody>
</table>

Materials

Maths Participation. Maths participation comprised HSC course plans as well as career intentions. HSC plans were ascertained via students checking boxes to indicate which level of maths HSC they planned to study. Since HSC coursework commences in Year 11, Year 11 reports are of actual rather than intended level of participation.

Career plans were ascertained via an open-ended question asking what career students intended pursuing. The maths relatedness of these plans was quantified using O*NET™ 98: The Occupational Information Network (U.S. Government, 1998). Categorisations were performed on the career content of students' nominated career plans for maths, as involving high, average, any or no mathematical content.

Gender Stereotypes of Maths. Personal and social gender stereotypes of maths were assessed via two items, each of which asked students to respond using 7-point Likert-type scales. Personal gender stereotypes were measured by the item: "Would you describe maths as being more suited to males or females?", and social gender stereotypes by: "Would society in general describe maths as being more suited to males or females?", each ranging from 1 (very feminine) through 4 (neutral) to 7 (very masculine).
Item distributions were found to be highly kurtotic, with the vast majority of students giving 'neutral' ratings to both questions (see Figures 4 and 5). It was therefore decided to use these items as grouping variables, such that students indicating maths as at all masculine formed 100% one group, those indicating it as at all feminine formed another, and those seeing it as neutral formed a third group, respectively for each item.

Procedure
The study was conducted with informed student and parent consent, and the approval of the School Principals and formal University and Departmental ethical bodies. Administration was in the regular classroom to maximise ecological validity. The researcher was present at each administration to clarify or answer questions where necessary, with a trained assistant to aid with disseminating and collecting instruments and answering questions.

Analyses
Boys' and girls' planned participation in maths through HSC course selection and related careers were analysed using dominance analysis, summarised by the $d$ statistic, which measures the extent to which one sample distribution lies above another and is used to make inferences about $\delta$, which measures the extent to which that is true in the population. This is a well established but not widely used measure for comparing two distributions (Cliff, 1993). For a random variable $X$ sampled from one distribution and a $Y$ from another, $\delta$ is the probability that $X > Y$ minus the reverse probability: $\delta = Pr(x > y) - Pr(x < y)$. The sample estimate $d$ of $\delta$ is the proportion of xs from one population that are higher than those from the other, minus the reverse proportion: $d = (\#(x > y) - \#(x < y))/mn$. As a descriptive statistic, $d$ is a direct reflection of the overlap in two sample distributions and is an unbiased estimate of $\delta$. Since the $d$ distribution is asymptotically equivalent to the $z$ distribution, inferential statistics can also be simply derived by converting $d$ to a $z$ score and comparing this with the appropriate critical value.

Evidence of personal gender stereotyping of maths was indicated by rating departures from the middle (neutral) category, and similarly for social gender stereotyping. Ratings below the midpoint reflected 'feminine', and ratings exceeding the midpoint 'masculine' gender stereotyping in each case. Chi-square tests examined whether there was any evidence for older Year 9 students holding stronger gender stereotypes, by comparing numbers of students from each cohort reporting maths as masculine, feminine or neutral, for each of personal and social stereotypes, separately for boys and girls. Students' qualitative explanations for ratings were thematically grouped and proportions of girls and boys from each cohort ascribing to the same explanations reported, for each of personal and social gender stereotypes.

RESULTS

Gender Differences in Maths Participation
As expected, boys planned to participate in higher levels of maths more than girls, as measured by senior high course level selections and career intentions. These differences were remarkably robust across grades.

Career Plans. As anticipated, at every grade level, a greater proportion of boys than girls intended pursuing highly maths related careers as shown in Figure 2. Calculation of $d$ shows the boys' distribution lies .12 (in Year 7) to .21 (in Year 11) higher than girls'. Effect sizes are significant in each instance ($p < .05$, see Table 2). Table 2 reports the $d$ statistic and its significance for each grade.

HSC Course Selection. Consistent with the trend for boys to plan greater participation in maths evident in career plans, a similar pattern clearly emerged with regard to planned participation in maths in senior high school. Students at each grade indicated which level of maths (Maths in Practice, Maths in Society, 2-unit, 3-unit, 4-unit, coded 1 to 5 respectively) they intended choosing in senior high school. Differences in proportions favouring boys were evident at each grade level, with effect sizes ranging from .13 to .18 (see Figure 4), and were statistically significant in each case (see Table 2). Recall that Year 11 responses reflect students' actual course level in senior high rather than intentions only.

Note. Year 11 results reflect students' actual course levels, since senior high maths commences in Year 11.
Table 2

Gender Differences in Maths Participation as Measured by Cohen's d for Career Plans and HSC Courses

<table>
<thead>
<tr>
<th>Academic Choice</th>
<th>Year 7 start</th>
<th>Year 7 end</th>
<th>Year 8</th>
<th>Year 9</th>
<th>Year 10</th>
<th>Year 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career plans</td>
<td>d</td>
<td>z</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.145</td>
<td>0.119</td>
<td>0.178</td>
<td>0.158</td>
<td>0.207</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.066</td>
<td>0.047</td>
<td>0.046</td>
<td>0.037</td>
<td>0.045</td>
<td>0.064</td>
</tr>
<tr>
<td></td>
<td>2.20</td>
<td>2.53</td>
<td>3.87</td>
<td>4.54</td>
<td>3.51</td>
<td>3.23</td>
</tr>
<tr>
<td>HSC course level</td>
<td>d</td>
<td>z</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.130</td>
<td>0.137</td>
<td>0.126</td>
<td>0.138</td>
<td>0.162</td>
<td>0.175</td>
</tr>
<tr>
<td></td>
<td>0.060</td>
<td>0.043</td>
<td>0.041</td>
<td>0.033</td>
<td>0.040</td>
<td>0.059</td>
</tr>
<tr>
<td></td>
<td>2.27</td>
<td>3.19</td>
<td>3.07</td>
<td>4.18</td>
<td>4.05</td>
<td>2.97</td>
</tr>
</tbody>
</table>

Note: Positive values correspond to higher ratings for boys, negative values to higher ratings for girls, * denotes significance at p<.05.

Gender Stereotyping of Maths

**Personal Gender Stereotypes.** Overwhelmingly, students rated maths as equally suited to males and females (see Figure 4). For students reporting personal gender stereotypes, a greater proportion of both boys and girls perceived maths as 'masculine', with negligible proportions of students perceiving maths as 'feminine'. Chi-square testing comparing numbers of boys from each cohort rating maths as masculine, feminine or neutral was not significant ($\chi^2 (4, N=604) = 6.39, p>.05$), and neither was it for girls ($\chi^2 (4, N=488) = 3.37, p>.05$), failing to support the hypothesis that personal gender stereotypes may be stronger for older Year 9 students.

**Social Gender Stereotypes.** Similarly to personal gender stereotypes, the majority of students rated societal perceptions of maths as being equally suited to males and females (see Figure 5). Where social gender stereotypes occurred, a greater proportion of students reported societal perceptions of maths as 'masculine', with again a negligible proportion reporting them as 'feminine'. Social gender stereotypes appear more prevalent than personal ones, with an apparent age trend, whereby social gender stereotypes appear more prevalent for the eldest cohort as hypothesised. However, this developmental trend failed to achieve statistical significance for either boys ($\chi^2 (4, N=588) = 4.26, p>.05$), or girls ($\chi^2 (4, N=483) = 7.15, p>.05$).

**Differences Between Personal and Social Gender Stereotypes.** Social gender stereotypes were more prevalent than personal gender stereotypes for each cohort (see Figures 4 and 5). A greater proportion of both boys and girls within each of Cohorts 1 to 3 rated societal perceptions of maths as being masculine. As for personal stereotypes, social stereotypes of maths as feminine were negligible.

Figure 4: Proportions of boys and girls from each cohort rating personal perceptions of maths as being more suited to boys, girls or neither.

Figure 5: Proportions of boys and girls from each cohort rating societal perceptions of maths as being more suited to boys, girls or neither.
Explanations for Gender Stereotypes

**Personal Gender Stereotypes.** For boys personally stereotyping maths as masculine, feminine or neutral, reasons for masculine ratings included the existence of male role models (40%), males being smarter at maths (40%) and being sexist (20%). Boys' reasons for feminine ratings included girls performing better (39%), trying harder (20%), needing maths more for their careers (29%) and teachers favouring girls (14%). Reasons for neutral ratings were that it depends on individuals (5%), not being sexist (15%), both sexes being the same (61%), the gender overlap in maths performance (7%) and both sexes needing maths (12%). These reasons are tabulated in Table 3a.

Girls' reasons for masculine stereotypes were because boys perform better at maths (100%). Reasons for feminine stereotypes included girls trying harder (67%) and that it depends on the individual (33%). Reasons for neutral ratings were that it depends on the individual (8%), not being sexist (13%), both sexes being the same (53%), the gender overlap in maths performance (12%) and both sexes needing maths (14%). These reasons are tabulated in Table 3b.

**Social Gender Stereotypes.** Boys' explanations for masculine social gender stereotypes of maths again included the existence of male role models (54%), males being smarter at maths (40%) and societal sexism (20%). Boys' explanations for feminine social stereotypes were the existence of female role models (20%), no-one being fair to boys (20%), girls trying harder (40%) and girls needing maths more for their careers (20%). Reasons given for neutral social stereotypes were that it depends on the individual (4%), society not being sexist (22%), both sexes being the same (60%), the gender overlap in maths performance (6%) and both sexes needing maths (8%). These reasons are tabulated in Table 4a.

Girls' explanations for masculine social maths gender stereotypes were the existence of male role models (75%), boys performing better at maths (13%) and societal sexism (13%). Reasons for feminine social stereotypes included sexism (50%) and female work needing maths more (50%). Reasons for neutral social stereotypes were that it depends on the individual (2%), society not being sexist (21%), both sexes being the same (59%), both sexes needing maths (15%) and the gender overlap in maths performance (3%). These reasons are tabulated in Table 4b.
As anticipated, boys planned to participate in maths to a greater extent than girls, as operationalised through examination of students' planned levels of HSC maths and maths-related career intentions. Boys planned both to pursue higher levels of HSC maths and have more highly maths-related careers than girls. Conversely, a greater proportion of girls planned to pursue the lowest levels of HSC maths and careers involving no maths. It is worth noting that reported intentions appeared remarkably stable through grades 7 to 11. In the case of HSC maths plans, where these were only those relating to intended level of participation, the similarity of earlier with grade 11 data reflects actual rather than intended level of participation. The interpretation of social gender stereotypes in terms of future behaviour is important. It is remarkable, given the wealth of experience students accumulate through high school, and the efforts of educators to moderate students' beliefs about subject choice, that plans for participation in maths are quite stable throughout high school.

Gender differences in maths participation identified in this study support a plethora of research findings that women are under-represented in the study of maths and in career requiring maths (e.g., Fennema, Wollert, Pedo, & Becker, 1981; Sherman, 1982; Willis, 1989; Leder, 1992). Given that differences in maths performance are unlikely to account for differences in participation (Hyde, Fennema, & Lamon, 1990; Friedman, 1989), students' perceived maths gender stereotypes were examined, since gender stereotypes are believed to provide the knowledge base against which adolescents match behaviour and evaluate its appropriateness (Eisenberg, Martin, & Fabes, 1996).

As expected, gender stereotypes about maths favoured males where they occurred, with the highest proportion of students holding masculine personal gender stereotypes being 10% (cohort 3 boys), although the overwhelming majority of students professed holding no gender stereotypes about maths. Student perceptions of societal gender stereotypes about maths also favoured males, where these occurred, the highest proportion for any group reporting masculine societal perceptions being 20% (girls in cohorts 1 and 3) although, again, the vast majority of students reported societal perceptions about maths to be non-gender-stereotypic.

Both personal and social gender stereotyping of maths as 'masculine' may be expected to impact on boys' and girls' intentions regarding maths participation. Girls who personally stereotypically view maths as masculine are likely to pursue high levels of maths, perceiving themselves as unsuited to it. Boys personally stereotyping maths as masculine may be encouraged to participate strongly in it, perceiving themselves as well suited to this domain. Also, girls perceiving societal gender stereotyping of maths as 'masculine' may be less eager particularly to pursue highly maths-related careers, perceiving impediments to their success via lack of social support and even social antipathy. Conversely, boys perceiving societal stereotypes of maths as 'masculine', may feel their likelihood of success in this domain is enhanced through social support. Stereotyping of maths as 'feminine' may be expected to have the reverse impact, although proportions of students subscribing to maths as feminine were negligible (less than 5%) in any case.

Although it is certainly possible that cultural conceptions of maths are no longer stereotyped as masculine, students' qualitative responses provided at Year 7 by students in Cohort 1, explaining their personal ratings, suggest an alternative explanation. 15% of boys and 13% of girls gave the explanation that they are not suited to maths. This could also be construed as a politically correct response. For social gender stereotypes, 22% of boys and 21% of girls gave not suited as their explanation for neutral societal gender-stereotypic ratings, and 60% of boys and 59% of girls gave both sexes are the same as their explanation for these neutral ratings. It is suggested that these students may be desirous of giving what are perceived as politically correct responses to questions about gender difference. This possibility is further strengthened by student comments on the study when they were encouraged to ask questions of the researcher following administration, where several independent comments about the 'sexist survey' were made. Conversely, a greater proportion of girls planned to pursue the lowest levels of HSC maths and careers involving no maths. It is worth noting that reported intentions appeared remarkably stable through grades 7 to 11. In the case of HSC maths plans, where these were only those relating to intended level of participation, the similarity of earlier with grade 11 data reflects actual rather than intended level of participation. The similarity of earlier with grade 11 data supports the veracity of student intentions as predictors of later behaviour. It is remarkable, given the wealth of experience students accumulate through high school, and the efforts of educators to moderate students' beliefs about subject choice, that plans for participation in maths are quite stable throughout high school.
Association for the Advancement of Science) Conference, the only conference paper to make national front page and headline news was headed 'Girls Don’t Count in Maths', and was followed by a biased and inaccurate summary of the work presented (Willis, 1989). The research of Benbow and Stanley (1980), which attempted to find a biological basis for male and female mathematical achievement, prompted a highly disturbing response from the media. Some news report headlines of this research were 'Do Males have a Math Gene?', 'The Gender Factor in Math', 'Male Superiority', 'Are Boys Better at Math?', 'Boys Have Superior Math Ability, Study Says', 'Sex + Math = ?', and 'Study Suggests Boys May be Better at Math' (Eccles & Jacobs, 1986). One must be concerned about the effect of such coverage on students' maths-related attitudes.

In the face of such pervasive gender stereotyping by the media, passive non-discrimination is simply not an adequate intervention strategy, given the proportions of boys and girls citing boys being better at maths as explanations for their masculine personal gender stereotypes about maths.

What are the implications of these findings for policy and practice? Clearly educators could easily give examples of female role models as well as the oft-cited great male mathematicians of the past. It is likely that ensuring similar proportions of male and female maths teachers, particularly for the higher levels of maths, would also have a positive effect in reducing masculine stereotypes about maths. In addition, active strategies should be undertaken to counter-balance invalid and disproportionate media emphasis on boys being naturally better at maths than girls. This could be in the form of a 'current research about students and schools' section in the weekly school newsletter for example, with information drawn from reputable academic journals. Although it appears encouraging that incidence of gender stereotyping of maths is low from this study, the overwhelming 'neutral' reported gender stereotypes should be interpreted with some caution, given that explanations for these perceptions suggest possible constraints of the current climate of political correctness.

References


Reproduction Release
(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: Exploring perceived personal and social gender stereotypes of maths ability in senior secondary students: an explanation for continued gender differences in participation

Author(s): WATT, Helen M G

Corporate Source: University of Sydney

Publication Date: December 2000

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, Resources in Education (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign in the indicated space following.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 1

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g. electronic) and paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2A

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.

The sample sticker shown below will be affixed to Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Level 2B

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only.

Documents will be processed as indicated provided reproduction quality permits.

If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.
I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche, or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Signature: [signature]
Printed Name/Position/Title: Ms Helen Watt, Lecturer
Organization/Address: Faculty of Education, University of Sydney, NSW 2006 Australia
Telephone: +612 9351 6840
Fax: +612 9351 2606
E-mail Address: h.watt@edfac.usyd.edu.au
Date: 7/12/06

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility