

CONSTRUCTING THE FEMALE MATHEMATICS TEACHER: A NEW ZEALAND HISTORICAL CASE STUDY

Margaret Walshaw and Roger Openshaw

Massey University, New Zealand
m.a.walshaw @ massey.ac.nz

ABSTRACT: In this paper we explore the ways in which meanings of the female mathematics teacher are subjectively and collectively constructed, legitimated and challenged. Our context is New Zealand during the 1950s. We use history to explore female mathematics teacher constructions by looking at the genesis, development, and outcome of an initiative of the New Zealand Department of Education. The Science and Mathematics New Scheme, conceived in 1957 and introduced early in the following year, represented a sustained attempt on the part of the government to attract young women into the teaching profession as a way of managing a crisis in teacher supply. Our historical analysis offers a lens through which to view the production of and challenges to gender knowledge during a time of political and social ambiguity towards professional women.

KEYWORDS: mathematics teacher; girls and women, New Zealand; New Scheme

INTRODUCTION

The themes of the masculine image of mathematics and differential identities of teachers of mathematics are recurring themes to those interested in the gendered history of mathematics. In this paper we look at a New Zealand case study from the 1950s and explore mathematics and gender by critically examining the introduction of a national policy document, the Science and Mathematics New Scheme, 1957, within a multi-layered context. This context consisted of three contradictory elements: the international furore precipitated by the launch of Sputnik 1 by the Soviet Union that linked national progress with the teaching of mathematics and science; the awakening of interest in female potential that led to the second wave of feminism; and the extremely gendered nature of New Zealand society.

At the heart of our analysis are female mathematics and science teachers. The way in which they are implicated within the Scheme is of particular relevance today. For instance, in the early twenty-first century, we are witnessing official educational statistics promoting girls' new enhanced mathematical capabilities. However the global interest in women's achievements sits alongside the continued existence of a so-called class ceiling which creates constraints on those achievements.

Hence, an exploration into the genesis, development, and outcome of the Science and Mathematics New Scheme in the late 1950s provides an opportunity to narrate a contemporary story concerning gendered hierarchies. Accordingly,

our analysis explores, both concretely and contextually, how meanings of gendered identities, such as the female mathematics teacher, were then and are constructed, legitimated, challenged, and transformed in particular times and contexts.

EMERGING ISSUES IN POST-WAR MATHEMATICS

a) The Teacher Supply Issue

In July 1958 a notice from the New Zealand Department of Education, intended for insertion in official publications such as the *Education Gazette*, announced that a special training course for young women was now established. Known as the *Science and Mathematics, New Scheme, 1957*, the course represented an attempt by the government to attract young women who might be interested in teaching mathematics and science in post-primary schools, without diverting those who were qualified for and prepared to undertake a full university course in those subjects (Department of Education, Circular T58/30, 1958). The course was to be of three years duration, two years of which were to be spent under special instruction. During a further year students would work in post-primary schools, closely supervised by experienced secondary school heads of departments. The stipulated minimum qualifications were University Entrance or Endorsed School Certificate, with evidence of ability in mathematics or science, though how the latter was to be determined remained unspecified. Students in the lower sixth form [Year 12] could apply for entry into the course in anticipation of gaining the required qualification. It was anticipated that the two years during which applicants were to spend at teachers' college would be devoted mainly to subject content, with lecturing undertaken by experienced teachers seconded from post-primary schools. The emphasis was to be on consolidation of University Entrance mathematics to enable students to gain confidence in the content. The circular also stressed that every endeavour would be made to develop an interesting course so that the young teachers would in their turn, stimulate teaching of their chosen subject in schools (Department of Education, Circular T58/30, 1958).

How did this come about? This particular story begins in 1943 when the New Zealand Thomas Report was introduced. The Report made available to students two post-primary mathematics curriculum options (Department of Education, 1944). Although the report conceded that secondary schools would need to retain a traditional full mathematics course leading on to the senior secondary school and university study, it also proposed a curriculum through which students would address a variety of mathematical topics designed for use in everyday life. The core mathematics course thus offered a range of skills the average citizen required, the intention being that “[e]ven the weakest of our students should be given the opportunity to see and admire some of the minor works of mathematical art” (Murdoch, 1950, p. 164). The reality, however, was that core mathematics courses were perceived to be of lower status, becoming the butt of the jokes within the mathematics community: “Have you heard what one Stage I [100 level] university teacher says to another, over a cup of tea, about mathematics in post-primary schools?” (Webster, 1950, p. 3).

Following the release of the Thomas report, a Committee on Teaching of Elementary Mathematics was established, charged with the task of examining the teaching methods, syllabus and resources for core mathematics classes. The committee warned that “[u]nless something is done to improve qualifications of

teachers then there will be little prospect of raising the standard in this one of the three R's" (Department of Education, 1949, p. 23). The committee recommended an intensification of refresher courses in mathematics teaching, the tightening of arithmetical requirements for teachers college entrants, and giving more encouragement to those holding post-primary teaching bursaries to include mathematics in their degrees. It also suggested that university authorities introduce a general course in mathematics, broadly of Stage 1 [100 level] standard, intended to be part of a liberal education for those intending to teach at post-primary schools (Department of Education, 1949, pp. 21-23). Although in making this suggestion, the committee did not expressly single out women, the various justifications for the introduction of the Science and Mathematics New Scheme less than a decade later, in 1957 were to clearly reflect the view that the existing university BSc course acted as a major deterrent for the recruitment of qualified women into secondary teaching.

By the mid-1950s, however, the New Zealand Government was facing an urgent issue of secondary teacher supply. An advisory committee on recruitment was set up in 1956, to which the Post-primary Teachers' Association (PPTA) lent its support. In June 1957, with a general election looming, the opposition Labour Party tabled a want of confidence motion following the address in reply, proclaiming the issue of teacher supply "... a national emergency of such magnitude that only drastic action on the part of the Minister and Director of Education and their Department, with the full support of the government, can solve the problem" (*New Zealand Parliamentary Debates {NZPD}*, vol. 311, 1957, p. 409). Mathematics and science graduates were in particularly short supply, with girls' schools facing the most acute shortages. Thus in July 1957, it was observed that there was "... a shortage of mathematics and science teachers, and a shortage of women teachers which is particularly grave" (*NZPD*, vol. 312, 1957, pp. 1198-1199). In the same debate it was claimed that Auckland Girls' Grammar was without a biology teacher, Epsom Girls' Grammar had to resort to part-time teachers for senior work, and Wellington Girls' College had no applicants at all in spite of repeated advertisements for senior teachers of mathematics and science (*NZPD*, vol. 312, 1957, p. 1209). An editorial in the *New Zealand Post-Primary Teachers Association [PPTA] Journal* gloomily speculated that, "...with so few women graduates in science subjects offering and with some of these absorbed in co-educational schools, one wonders how existing girls' schools – not to mention the ones coming into being – can manage to teach even a limited range of science subjects" (Qualifications of teachers and university failure rate, 1957, p.1).

As a stopgap, it was proposed that former female post-primary teachers whose children had reached primary school age be employed in a relieving or part-time capacity on the grounds that "[a]lthough the source of supply is limited, we shall need desperately as many of these people as we can get" ("Presidential address," 1956 conference). According to the PPTA President, the reasons for the reluctance of suitably qualified women to enter secondary teaching included: opting to marry earlier; entering the primary service instead, where money could be earned more quickly; making trips overseas; and being fearful of slipping school discipline.

Perhaps a more significant reason, however, was the contradictory attitude expressed towards women mathematics and science teachers. On one hand, both government and educational authorities on occasions actively sought well-

qualified women. Margaret Laidlaw, a highly qualified mathematics specialist newly arrived from Scotland, recounted the interview leading to her instant appointment at Epsom Girls' Grammar: "The first thing they said, after asking about my qualifications and my training, was 'what was I prepared to teach?' and I said 'maths - and science if I have to, but I was not so good at that' and they sat back in their seats and roared with laughter. And that was the end of my interview" (Openshaw, 1991, pp. 87-88).

This official desire to attract and retain qualified women, however, was very far removed from what was reflected in the wider society at this time. Thus, at the same time as women were beginning to make inroads into hitherto male-dominated spheres, there was also considerable resistance to women 'taking over.' Addressing the annual prize-giving ceremony at St Cuthbert's College, Auckland, Mr Justice North conceded that even the judiciary in New Zealand was losing the battle against the encroachment of women. North warned his audience, however, that "with almost every walk of life open to women, it was more than ever important that they should remember their womanly qualities" (Women winning the battle of the sexes, *New Zealand Herald*, 12 December 1957, p.16).

Moreover, many school principals during this era discouraged married women teachers. Even at Epsom Girls' Grammar where Laidlaw taught, "the Head didn't really like married women" (Openshaw, 1991). There were home responsibilities, too, for the working female teacher and these demands, together with insufficient salary inducement, contributed to a reluctance to seek out advancement within the profession. One teacher, responding to a PPTA questionnaire distributed to women teachers in the late 1950s, complained: "A man with a wife to run his home is in a different position. Perhaps there should be a 'housekeeper allowance' or a housekeeper income tax exemption" (The shortage of women principals, 1959).

Tertiary mathematics courses at Otago University during the early post-war period were taught with an apparent "reluctance to have females in the class" (Moore, undated). Margaret Crombie recalled: "When I approached [the Professor of Mathematics] on a simple question of basic calculus he looked me in the eye and said: 'Have you ever taken your bike to pieces?', pointed to a gas tap and asked which way it would have to be turned to turn it on and when I gave a negative answer to both, he shut my book and dismissed me" (Moore, p. 16).

b) Following in the footsteps of the Soviet Union

During the early 1950s New Zealand society was adjusting to a new post-war era of peace and plenty. Boys were being strongly encouraged to enter the workforce after leaving school; girls were encouraged to marry and become mothers. Thus, in 1962, it was argued that effective secondary mathematics teaching could help create better citizens even for those not mathematically minded. An easier type of mathematics would strengthen a boy's apprenticeship chances and enable a girl to know how much wallpaper to buy for a new house (Openshaw, 1992). While there was some official encouragement for all students of sufficient ability to take the full mathematics course, the support was popularly perceived to apply almost exclusively to boys (Webster, 1950). Core mathematics on the other hand, was envisaged as being particularly suitable for girls. Helen Wiley, a prominent female mathematics educator and activist for girls' mathematics education recalls that "there were no formal requirements, for girls

in those days, or for any students to continue any type of arithmetic or mathematics after the fourth form. I remember considering the school being quite forward looking, where they actually insisted girls went on” (Openshaw, 1991, p. 93).

The discourse of equal opportunity for girls attending coeducational schools was rarely contemplated. In particular, timetabling girls into full mathematics courses did not feature within these schools. Yet in the alternative core mathematics classes there were no schemes of work provided and precisely what mathematics teachers and students did in those classes was unclear (Bull, 1960). Laidlaw recalled her later experience as a school mathematics advisor in Auckland, asking one school what it was “doing about the girls who were not going to do full mathematics—the ones who dropped maths in the fourth form going into the fifth form,” and being informed that the girls “nearly all went into bookkeeping or secretarial work or domestic science.” Her advice to the school was that some of the girls were “quite keen on doing School Certificate in maths” and that “it would be such a boost in their careers to record School Certificate maths on their certificates.” On her return visit the following year she discovered that the school “had introduced a class in modern maths and managed to fit it into the girls’ timetable.” Reflecting on the circumstance that brought the new curriculum choice for girls, Laidlaw added: “yes, but the girls still have to opt *into* doing maths, whereas the boys have to opt *out* of doing it in the fifth form: there *is* a difference” (Openshaw, 1991, p.89).

The growing Cold War rivalry between the Soviet Union and Western nations added a sense of urgency to classroom mathematics and a fresh momentum to the recruitment of mathematics and science teachers throughout the Western World, including New Zealand, whilst also strengthening the case for more women mathematics teachers. The Minister of Education, addressing the PPTA Conference in July 1957 emphatically endorsed the recent remarks of Lord Coleraine in the United Kingdom, who had bluntly warned the nation that young English men and women would either have to learn science, maths and technology - or learn Russian (Minister’s address to the conference, *PPTA Journal*, vol.111 {6}, July 1957, p.17). The launch of Sputnik One by the Soviet Union in early October 1957, followed by Sputnik Two one month later, accelerated a view of mathematics and science education as a ‘political panacea’, a major instrument of economic and social policy for achieving objectives in the Western world and for regulating commerce, technology and science. Mathematical qualifications became highly valued, and higher status jobs often became dependent upon mathematical success.

A *New Zealand Herald* article in December 1957 argued that, “the Russian Sputniks have put education more in the news than ever,” adding that the nation urgently needed to develop its mathematics and science potential. Bull (1960) summed up the national mood in his claim that “[r]ecent events have underscored the value of mathematics in terms of sheer survival.... At stake is nothing less than our future competence as a people and our individual ambitions for our children. If the public is not yet prepared to recognise this, our responsible teachers, business leaders, politicians, and civic leaders should join together to convince them” (p. 70). At the same time, however, the very sense of national urgency and ongoing problems in teacher supply, coupled with continuing disincentives and less than desirable teaching conditions for women, served to encourage politically motivated, short-term, quick-fix solutions.

BOLD NEW INITIATIVE OR SERIOUS DILUTION?

It was within these particular conditions, and the discursive practices that accompanied those conditions, that the Science and Mathematics New Scheme, was introduced by an embattled National Government in the run-up to the November 1957 election. Established as a three-year non-university training course for young women intending to teach science or mathematics in secondary school classrooms, the Scheme was at odds with the standards demanded from other certificated secondary mathematics teachers and ran counter to much official rhetoric regarding the importance of qualifications. It was thus destined to be controversial from its outset. On 5 November, three weeks prior to the general election, a *New Zealand Herald* editorial claimed that the Scheme was “open to grave question, if only because it will almost certainly clash with the new post-primary studentship scheme, which attracted 300 students in 1956, and a larger number this year. The future of the entrants will also be doubtful since they are likely to remain permanently ‘below the salt’ unless standards are further lowered – which all would wish to avoid” (Grave lack of secondary teachers, (*New Zealand Herald*, 5 November 1957, p. 12).

These were destined to be prophetic words, but stronger criticism was to come in December 1957. With the incoming labour Government apparently committed to the introduction of the Scheme in early 1958, the headmistress of Auckland Girls Grammar School, Miss R.I. Gardner singled the Scheme out for special mention in her annual prize-giving address. Gardner was highly critical, claiming that “[w]hile the rest of the world was encouraging women to take responsible positions and enter the lists with men on equal terms, New Zealand was pandering to its women and offering them easy ways to avoid measuring up” (New Zealand ‘pandering to its women’, *New Zealand Herald*, 11 December 1957, p.16).

It is noteworthy that Gardner’s concerns anticipated the critiques of second wave feminists by nearly a decade. At a time when the New Zealand media consigned traditional roles to women, the content of Gardner’s address provides a clue that widely shared categories of social meaning were beginning to be questioned and contested. In her address, Gardner went on to observe that currently in New Zealand, studentships provided aid to support girls entirely during university years. Thus there was “... no need for any to succumb to the recent Government announcement that girls with science or mathematics ability who hesitate to spend a year in form 6A [Year 13] and fear the years of university study can renounce any attempt to gain a degree and slide into the ranks of the post-primary service by the back door.” Hers was a captive audience and most students as well as their parents, more likely than not, had little or no previous knowledge of the Scheme. Having put forth the theme of the ‘back door’, Gardner developed another line of attack to provide further ammunition to her very public stand against the Department of Education: “This is an offer made to girls only, and is born of desperation and expediency. It arises from the grim shortage of training girls and getting little or no teaching service in return.”

The PPTA had given the scheme only its reluctant approval. A critical editorial in the *PPTA Journal* of March 1958 began by outlining recent developments that had given practical encouragement to improve the qualifications of teachers. These included the increased number and value of post-primary teacher’s bursaries, an agreement to reward higher qualifications with

higher starting steps on the salary scale, the recent move to grant leave on full pay for one academic year to selected teachers to enable them to complete university degrees, and the promise of improved facilities for extra-mural studies. (The qualifications of teachers, 1958, p. 1). Turning to the New Scheme, however, the editorial observed:

At the same time as these developments have been taking place there has been what may appear to be a movement in the opposite direction. A scheme has been launched for the short-course training at Auckland of non-graduate women teachers of mathematics and science. Some branches have protested against our acceptance of this scheme on the grounds that it will reduce the status of post-primary teachers and that pupils taught by these people will not receive satisfactory teaching. These dangers were recognised by the Executive who gave only reluctant approval to the scheme and expressed the hope that it will prove only a temporary measure. The shortage of women teachers of science and mathematics is so grave that it is not a question of a choice between having these subjects taught by a graduate or a non-graduate but between having them taught by a trained non-graduate or perhaps not taught at all. The scheme will be watched closely. Serious dilution must not be permitted even in one limited area' (The qualifications of teachers, 1958, p.1).

Some PPTA members felt that giving reluctant approval to the scheme conceded too much. The Wellington College Branch of PPTA reported in the same issue that it had resolved to completely dissociate itself from the scheme. Instead it urged the PPTA Executive to refuse absolutely any extension of a measure that further reduced the status of teachers, and emphasised that the solution to recruitment lay in raising salaries to a point of equality with other callings ('From the Secretary: Science and Mathematics course for women', 1958, p.5). In responding, the PPTA President pointed out that in addition to PPTA representatives' reluctance to approve the scheme, they had been successful in getting a parallel scheme to train teachers of both sexes, specifically for junior secondary school mathematics classes, dropped altogether. The President went on to comment that '[i]t is easy for a Branch in a boys' school to disapprove a training scheme designed to provide a measure of much needed relief to girls' schools. The Executive cannot be so single-minded!' (From the Secretary: Science and Mathematics course for women, 1958, p.5).

In 1959 the Director of Education entered the controversy by publicly endorsing the Scheme in the *PPTA Journal* of March 1959. Responding to earlier criticisms of the Scheme, he argued revealingly that:

Many girls of good ability are disinclined to face the long and gruelling course for a degree in science. The situation is likely to deteriorate as fewer and fewer well-qualified science teachers become available for these schools. In part, this disinclination to take a science degree is due to an expectation of early marriage or the enticement of well-paid employment in less arduous jobs, but some girls are discouraged by the nature of the degree itself.

If the universities could make their present BSc an ‘honours’ degree and establish an alternative, broadly-based ‘pass’ degree, they would help the Department to find well-qualified women teachers of mathematics and science. Without them, the girls’ schools will feed to the universities fewer and fewer students able and willing to take a science course (*PPTA Journal*, March 1959, p. 11).

The Director was at this time deeply involved in negotiations with the University of New Zealand that were to lead eventually to the creation of four autonomous universities. Later he was to admit having taken a ‘hard line’ regarding the enforcement of the principle of equality of opportunity in the face of demands from many university academics for the academic freedom to teach whatever subject they wished, to whomever they wished (Beeby, 1992, p. 236). The Director’s assumptions regarding the interests and abilities of women opting for mathematics and science at the tertiary level, however, can also be regarded as merely amplifying the sentiments of the 1949 Committee on Teaching of Elementary Mathematics. Once again, the ambivalent attitude of both government and educationalists towards qualified women teachers of mathematics and science is clearly evident. In effect, the New Scheme was being justified, not in terms of quality but rather, its marketability as “a thorough and competent course in the principles and practice of teaching” (*PPTA Journal*, March, 1959).

THE TRIUMPH OF AGENCY OVER POLICY?

Despite such reassurances, however, it soon became evident that the Scheme was in danger of collapsing due to the lack of market support. A Departmental memo in 1959, less than two years after the introduction of the Scheme, conceded that whilst there had been more than 50 applicants in the first year of the scheme’s operation, the pool had drastically shrunk to less than 20 in the second year. The memo claimed that a major reason for the fall off in applications was due to the type of certificate the Department was offering. Many principals, it reasoned, were reluctant to urge girls to take a course that offered extremely limited promotion, relative to the opportunities available to those who opted to remain in the teaching service (Department of Education, 1959). A later pencilled in comment on the memo suggested that the point be made stronger with the addition of the words that the scheme did not “... give the trainees the full status of certificated teachers... and offers limited promotion” (Department of Education, 1959).

An essential tension, then, concerned the type of certification provided on course completion. After considering the situation for a number of months, the Departmental sub-committee strongly recommended that on successful completion of emergency course and on completion of the requirements of their third year of training in schools that the new teachers should be awarded a Teachers’ Certificate Class “C” (Director of Education, 3 March 1959). A Department of Education Minute Sheet dated 8/4/59 further observed that the Executive of the New Zealand Educational Institute had given approval for the “C” class certification and that interested parties should be notified of the decision.

In the face of falling interest from potential female applicants, the Department of Education sought to enhance the marketability of the scheme.

There was a concerted attempt to address concerns over the time allocations for teaching practice. The Probationary Assistant year was to be amended from 0.8 to 0.5 of a teacher for staffing purposes and they were not to be given a full teaching load in their first year. It was pointed out that, given these reduced allocations, they would have the time and opportunity to observe, prepare, and benefit from guidance by associates. It was anticipated that the reduced rating, along with careful placement and supervision of the probationary assistants, would “ensure that they received a teaching programme appropriate to their comparative immaturity and lack of experience” (Department of Education, 1959). In particular it was emphasised that mentoring and guidance by experienced Heads of Departments was essential to the successful training of the students involved in the special mathematics and science programme.

The gender-specific nature of the Scheme was to be challenged in early 1962, when a 27 year old male student who had passed 3 units of a BSc, but who did not hold a Post-primary Teaching Certificate applied to the programme. In his application, the students stated that he did not wish to study on a post-primary studentship, and had instead applied for entry to the New Scheme. Referring to the male student’s application in a memo to the Minister of Education, the Acting Minister of Education emphasised that the Course had been originally established to train “*women* students” who had gained University Entrance and wished to teach science and mathematics in post-primary schools, but who did not wish to study as full-time degree students (Campbell, 1962). However, following a personal interview, a District Senior Inspector of Post-primary Schools had concluded that the applicant was a potentially useful teacher. Given that the Scheme still had vacancies, and that the shortage of mathematics and science teachers remained very serious, Campbell recommended that the Minister give his approval. Accordingly, Tennent pencilled his approval on the memo. A second male student was admitted to the 1963 course and others were to follow. The admission of males, however, failed to halt declining interest in the New Scheme, and by 1964 it had been scaled down to a single Auckland venue (Campbell, 1962).

OFFICIAL POLICY VERSUS FEMALE AGENCY RECONSIDERED

The question we now need to consider in more detail is: To what extent are female mathematics teachers able to challenge officially endorsed constructions concerning women in mathematics? The introduction of the Science and Mathematics New Scheme, 1957, and the various reactions to it in many respects typify the contradictory discourses that were circulating about girls and women in mathematics during the early post-war era. Resistance to the New Scheme was high among educators. Generally speaking, however, the criticisms focused on the dangers inherent in the dilution of quality at secondary level, and (somewhat later), on the misuse of graduates by the schools they entered. Very few drew attention to the gendered ideologies upon which the New Scheme was based. Only Gardner stood out in noting that it had been sponsored with reluctance by the post-primary executive, which was ‘understandable only when one reflects that [the executive] consists of fourteen men and only four women.’ It was, she asserted, “an offer that panders to Victorian ideas and takes no heed of the ultimate fate in the teaching profession of those accepting it.” Gardner’s

argument was that, instead of encouraging hesitant or impoverished girls to continue with their studies, the New Scheme assumed that girls did not have the brains and minds of men, could not be expected to cope with masculine subjects like mathematics or science at university, and did not need a university degree to teach those subjects to their own sex. Hers was not a criticism of the New Scheme for its compromised standards, its differential certification, and its unrealistic ratings. Rather, the distinguishing feature of Gardner's argument was that there was no logical connection between pedagogical capacity and the sex of one's body.

The New Scheme and its reception posed a difficult dilemma for the Department of Education. On one hand, it was publicly committed to the equality of educational opportunity. On the other, in supporting and promoting the Scheme it was using biological difference to address the problem of teacher supply in secondary schools. Thus, when males applied to join the New Scheme the Department was caught up in a paradoxical situation. In trying to intervene on behalf of girls and women, the state both implicitly attributed an identity to the young women which the Scheme targeted, but simultaneously had to deny the negative characteristics that accompanied that identity. This is the same dilemma many feminist educators later had to face. As Scott (1996) has noted, "in order to protest women's exclusion, they had to act on behalf of women and so invoked the very difference they sought to deny" (p. x).

In the end, the Scheme might be said to have died a natural death due largely to its inability to continue to attract young women or, for that matter, young men. To this extent, Gardner's concerns that the result of the Scheme would be a generation of inferior, sub-professional women mathematics teachers, did not take sufficient account of the market resistance to the Scheme from school principals and potential applicants, who appear to have appreciated its pitfalls. As McKenzie, Lee, and Lee (1996) argue, "if controlling the hearts and minds of teachers is difficult ... it would seem that the task of attempting to control the expectations of consumers is even more so" (p. 20).

In our analysis we drew on conceptual tools that allowed us to understand how meanings of female mathematics teachers are constructed within contemporary social processes. Those tools also provide a way of understanding the agency people have, and more specifically, the capacity they possess to either legitimate or to challenge political and social processes. Our study also revealed that then and now female mathematics teachers are the product of the discourses and practices through which they become subjected *and* through which they have agency. The agency the young women exercised by not enrolling in the New Scheme suggests that even without being directly aware of Gardner's critique of it as 'pandering to women', they had likewise discerned that the Scheme was an intellectual and professional cul-de-sac. The analysis has therefore pointed to the instability of the category 'female mathematics teacher' and to the ways this category is able to be changed.

Clearly, behind mathematics teacher supply lies a whole social and political context embedded with ideological constructions about who should teach mathematics. We have explored the ways in which history and power inscribe conflicting social positionings onto the same pedagogical space. Analysing the ways in which the Science and Mathematics, New Scheme worked both for and against women has allowed us to explore the ways in which history operates as a site of the production of gender knowledge. It has provided us with an

understanding of the hierarchies of gender as an historical phenomenon and the ways in which those hierarchies are legitimated and challenged. In this way history offers a different lens through which to view early post-war educational progress and change.

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