
Recognising Gender in Mathematics Identity Performances— Playing the Fool?

Lisa Darragh
Universidad de Chile

This paper uses the metaphor of a theatrical performance to understand, analyse and present students' mathematical identities in the context of secondary school in New Zealand. Three vignettes are presented: a scene description, a short play, and a monologue. Each vignette is analysed in terms of gender; looking at the positioning of girls within their mathematics learning experiences. In the second part of the paper this gender recognition is problematized. A notion of the researcher positioned as audience is employed to question the unintended effects of recognising gender in identity performances.

Introduction

Identity is a concept that is currently enjoying something of a surge in popularity within mathematics education research (Chronaki, 2013; Cobb, Gresalfi, & Hodge, 2009; Lerman, 2012). MES7 in Cape Town, South Africa included a large number of papers and presentations on this topic. Identity has been referred to as the “missing link” in the “complex dialectic between learning and its sociocultural context” (Sfard & Prusak, 2005, p. 15) and it is seen as related to issues of power (Gutiérrez, 2013), access (English et al., 2008) and opportunity to learn mathematics (Esmonde, 2009).

However it is a concept that suffers from conflicted, and at times incoherent, definitions within the literature of our discipline (Cobb et al., 2009; Lerman, 2012). The way we define identity has implications for the way we recognise identity of our research participants, our students, and groups within the wider population. This recognition works power on these individuals and groups by labelling and categorising them in particular ways. As such it is important that we take care with

both our definition and recognition of identities. With this paper I question my own recognition of gender identity from the position of researcher.

Identity as Performance

In an attempt to resolve the conflicts described above, I draw from Goffman's (1959) theatre metaphor and Butler (1988) in defining identity as *performative*. Our identities are constituted through repeated acts. To clarify I do not see identity as *reflected* in performance; rather that identity *is* the performance. This aligns more closely with Butler's meaning rather than that of Goffman. The identity exists only in the moment it is performed. However these performances are embodied over time, and the collection of performances work together to constitute an enduring sense of self, a performance *repertoire*. Furthermore positioning theory, which draws from and extends Goffman's work (van Langenhove & Harre, 1999), can be used to help understand the interactions between people or the identity performances given.

Our mathematics identity performances might include putting a hand up to offer an answer during a lesson, persevering to solve a problem, arguing or justifying a solution given. We may perform by working silently and individually or by giving up on a problem after a single attempt. Such performances are enabled or constrained by many factors, including the classroom, the teacher, peers, parents, possible future performances and not least by past performances. And yet we will be recognised in these performances as being particular kinds of people; the good learner, or the unconfident student for example.

We can extend this metaphor of performance to consider the stage, the direction, the audience, the scripts and the notion of co-performance. The stage, such as the classroom, is the immediate context for the performance. The teacher may be seen as a director of performances, exerting influence in direct ways. The audience forms part of the context as those who witness an identity performance respond to it and influence future performances. The researcher is also an audience member – their presence may affect the performance and they are certainly responding to and recognising the performances as being indicative of being a certain kind of person. We perform from scripts, that is, expected ways of being, that are drawn from wider society.

These scripts may be stereotypes and they may provide only limited acts for the performer. And yet we may perform impromptu and in doing so generate new scripts for performance available for ourselves and others to follow. Finally co-performances occur when an individual enacts more than one identity at the same time and with the same act. Sometimes co-performances work well together – performing confident, performing boy, performing good mathematics student – and sometimes they do not.

Context and Methods

The data to follow has been taken from an 18 month study looking at students' mathematical identity performances as they transitioned from primary to secondary school in a New Zealand city (see Darragh, 2014). The study was undertaken from 2011 to 2013.

The transition to secondary school occurs at around the age of 13 years for most New Zealand students and brings with it a number of changes to students' experiences of mathematics learning. It was an assumption of the study that with this change there would be change in the ways in which students' performed mathematics identities.

Twenty-two students were followed and 'visited' four times over this transition. The visits occurred: at the end of Year 8 (the final year of primary school), at the beginning of Year 9, midway through Year 9, and at the beginning of Year 10. At each visit the student participants were observed during mathematics lessons and interviewed afterwards for approximately 15-20 minutes. The students' Year 8 and Year 9 teachers were also interviewed.

The following data is taken from the observations of two of the Year 10 mathematics lessons and an interview with one of the Year 9 teachers. It is part of the data from three different girls in the study: Emily, Belinda and Lauren.

Three Vignettes

In line with the theatrical metaphor for identity I present my data in a series of vignettes: a scene description, a short play, and a monologue.

A Scene

The curtain rises to reveal a secondary school classroom. Desks are spaced in rows and columns, all facing the front of the room towards a whiteboard. The teacher sits at his desk to the front and right-hand side of the room. There are 8 girls and 20 boys seated at the desks. The girls take the positions in desks along the furthest edge of the room, far from the teacher's desk, at the margins.

There is much research about the marginalisation of girls in mathematics education (see for example: Mendick, 2005; Solomon, 2007; Solomon, Lawson, & Croft, 2011; Walkerdine, 1998), but in this lesson I saw a physical manifestation of this. When I interviewed Emily after the lesson she was unable to give me any insight into the seating choices of her classmates and herself. She explained that the form classes were re-streamed for mathematics and that the girls knew each other more than they knew the boys, indicating that this was why they had chosen to sit together. Why they sat far from the teacher's desk remained unknown to me.

During my observation of this lesson I noted that no girl put up a hand to answer or ask a question at all, despite there being many opportunities for discussion, to which the boys contributed. The girls sat at the margins and they also performed marginalised mathematics identities.

A Play

SCENE: *A classroom filled with students of around 14 years of age. Students are seated at desks in groups of four. One group, containing BELINDA, two other girls and one boy, is at centre stage under the spotlight...*

TEACHER: Before we start, are you familiar with trig ratios? If not, you need to pay attention. (She writes up a trigonometry question on the board.)

BELINDA: (Raises hand) It's eight.

TEACHER: Very good. Do we need another example? Right, now make sure your desks are joined so you can discuss. The winning

group will get the pizza next week. (Teacher hands out a whiteboard marker, small whiteboard and question sheet to each group.)

(BELINDA takes the marker and the board. BOY grabs the question sheet and starts to work it out on his own.)

GIRL 1: (Snatches the question sheet back and starts to read the question out to the others.) A ladder is rested against a wall...

(BELINDA draws a triangle on the whiteboard and labels the sides and angle with numbers. She takes the BOY's calculator. He takes it back. She writes in a four.)

GIRL 2: Don't do the four like that, make sure it is all joined up.

(BELINDA hands the board to the teacher.)

TEACHER: Well done, here is the next question.

(BOY takes the question sheet and starts to write the question and answers on the board. He uses his calculator occasionally.)

GIRL 1: Read it out!

(BOY continues to work, ignoring GIRL 1.)

GIRL 2: So did you see that movie last night?

GIRL 1: Nah, I've seen it before.

GIRL 2: What about that thing they do with the knife?

BELINDA: I can do that too.

(BOY hands in the board to the teacher and gets the next question sheet.)

BELINDA: Read it out!

(BOY continues to work on his own. GIRL 1 grabs the question sheet. BOY grabs it back, writes an answer and takes it to the teacher.)

TEACHER: This group is doing really well. (She gives the BOY the third question sheet).

(BOY takes his calculator and starts inputting numbers.)

GIRL 2: Can you really do it?

BELINDA: Let me show you. (She picks up a pen and spreads her fingers out on the desk. She stabs the spaces between each finger and gets faster and faster.)

GIRL 1: Woah!

(BOY hands the third answer to the teacher. The teacher shakes her head.)

BELINDA: Let me see, you got it wrong. (She takes the question sheet and starts to read it.)

(The teacher comes over to the group and starts to explain the

problem. BOY takes the question sheet back from BELINDA.
(The teacher leaves the group.)

GIRL 1: I hate my ears. I have to wear my hair like this 'cause my ears are so big.

BELINDA: I've got really small ears – they look stupid though, see!

GIRL 2: You have a small nose at least – look at mine.

GIRL 1: My tongue is really long – I can touch my nose.

(The three girls all stretch out their tongues and try to touch their noses. Meanwhile BOY writes down an answer and hands it to the teacher.)

TEACHER: Great, now the last question requires you to make a nice poster showing all your working and the answer.

BOY: My desk is too messy for this. (Turns to BELINDA) Can you move so I can do this on your desk?

(BELINDA does not move. BOY tidies away his belongings into his bag. He starts to write on the poster.)

TEACHER: The poster that is the nicest with good working will get extra points.

BOY: (Hands the poster over.) I've done the maths now you guys finish it.

BELINDA: Ok, we'll make it pretty.

BOY: Yes you three need to make it pretty. Here, use my felt pens. You have ten minutes.

(The three girls enthusiastically bend over the poster and start colouring. BOY stands over them, watching and micro-managing.)

TEACHER: Well done, this is the winning group!

It is useful to use positioning theory here to understand this play; particularly the way in which “each of the participants always positions the other while simultaneously positioning him or herself” (van Langenhove & Harré, 1999, p. 22). Before the group work began, Belinda positioned herself as an able mathematics student; she answered a number of questions, publicly demonstrating that she knew how to work out trigonometry problems. Once the group activity began it appeared that BOY was also positioning himself as the one who knew the answers. Belinda and BOY engaged in a power-play for control of the marker, question sheet and recording sheet. Controlling resources endows advantage in controlling the discourse for that student (Barnes, 1998). One difference in their actions was

that while Belinda tried to include the others, BOY wanted to complete the task alone. Half way through the activity Belinda was drawn into a discussion with the other two students, GIRL 1 and 2 who appeared to be her friends. BOY continued the mathematics work, returning it to the others when it was time to present and make it “pretty”.

For BOY and Belinda, positioning themselves as the mathematics expert required positioning the other as not. This positioning appeared not to impact on the other two girls. However they were actively positioning Belinda into the role of ‘friend’ and ‘girl’ by drawing her into a discussion about the problems with their facial features. In doing so they positioned Belinda within a figured world of friendship that was also gendered (see for comparison Esmonde & Langer-Osuna, 2013).

When I tried to engage Belinda in a discussion about this activity during the following interview, she revealed her perceptions of the influence of the others in the group. When I asked about what might have changed with different group members she said they “probably would have worked together ... or not done it at all (laughs)” (Belinda, Year 10 interview). This demonstrates an effect of peers on performances (see also Ingram, 2008) and raises the question of how much agency Belinda (and the others) had in this group learning situation.

A Monologue

Algebra [is the most important topic]. Definitely algebra, you know, um, especially girls they find it quite hard. And measurement too. Algebra, well ... girls, um, well I don't want to make it like offensive, but yeah, comparing with the boys, they are not as logical as are boys. Or, ah, I mean, boys are just - they are born with that kind of um, ah, like a skill, when they, it comes with them, like area or measurement, they just know. I mean, just get the concept really easily. But girls, it takes time, and I guess for them it is hard to, um, you know, handle it. I just feel that [algebra is] a boys verses girls sort of thing. [...] I think I know why girls they are not really good at algebra, because it can be not really practical, if it is practical they can understand better, but girls they are not really, like if it is like ... abstract, it is hard to understand it, for them - I think. I might be wrong. (Lauren's

Year 9 teacher interview)

Clearly this teacher recognised gender in the performances of his students. His comments were made say-able by his drawing from societal scripts which often describe mathematics as masculine (Mendick, 2006) and ability as natural (Solomon, 2007). However his interview responses are somewhat surprising given the situation of a female interviewer. None of the other teachers interviewed for this study made similar suppositions regarding gender.

Ironically this teacher taught at a single-sex girls' school. In fact, his entire (three year) teaching career had been at this school and any experiential based comparison between girls and boys learning mathematics was based on his more limited practicum and tutoring experiences. My own interpretation of the situation was that this teacher had experienced difficulties in the teaching of the more abstract topics like algebra and seemed to have attributed his lack of success to gender.

Discussion

In the theatrical production that is this paper, the teacher described above can be seen as playing the role of the jester. He displays unconscionable attitudes to girls' competence in mathematics, arguably acting the 'fool'. And yet the jester in a theatrical production may in fact serve to send a message to the audience. The message I received concerns the recognition of gender and the possible mis-recognition of identity performances.

The teacher recognised gender in his students' difficulties with algebra. And I recognised gender in each of the vignettes reported above. The girls were marginalised, they were positioned into superficial and non-mathematical roles in the group learning situation and they were recognised as incompetent by their teacher.

However I would like to problematize this gender recognition. Do we as researchers, like the fool, recognise gender when it may just as well be other identity performances that we are mis-recognising instead? My recognition of gender during data collection and analysis derived in part from my own experiences of being a girl in mathematics classes and from my engagement with the research literature

on girls as marginalised in mathematics education (Burton, 2003; Mendick, 2006; Solomon, 2007; Walkerdine, 1998). Although such research is often problematised itself, I arrived at the theatre ready to recognise gender.

Consider, for example, the play above. In my labelling of the other characters in the play (and in my field notes) as BOY and GIRL, I indicate my own immediate interpretations of this as a gender issue. Before I had a chance to formally analyse my data I had already viewed it through a gender lens. I saw Belinda and BOY as competing to be the mathematical authority, and the boy as ultimately winning in this. Had I labelled the other characters as STUDENT 1, 2 and 3 then I would be highlighting the co-performances of friend and student that Belinda was forced to try and merge together.

However, due in part to my labels, when I heard the girls talking about their appearance, worrying about their ears being too big or too small I recognised this as a gender performance drawn from the figured world (Holland, Skinner, Lachicotte, & Cain, 1998) of gender relations or perhaps of beauty and sexual stereotypes. When BOY passed the mathematics work to his three female group-mates and told them to make it “pretty” I recognised this as positioning them within gender discourses where the males do the thinking and the females do the superficial work.

Was I right to recognise gender here?

[R]arely if ever do researchers raise the question of the relevance of the specific categorisations and identities chosen to represent the participants to the research. Consequently, particular identities are taken for granted and assumed to reflect the identities actually realised, felt, or believed by the participants. (Stentoft & Valero, 2009, p. 61)

Belinda did not engage in an explanation of gender during the follow-up interview. Furthermore the character of BOY was more than just a boy for Belinda. He held a historically constituted social position in the class and she would have been responding to him within a much more complex web of relationships than that which I observed.

There were certainly multiple performances required of Belinda. How easy was it for her to co-perform able mathematics learner, girl, and friend along with any other identities invisible to me? And how

might recognising her performance in terms of gender work to render those other identity performances less visible?

The social world can be conceived of as performed and created through the repetition of performative acts. Law and Urry (2004) use this terminology. The act of research in particular creates the reality it seeks to investigate. These authors apply their arguments to methodology specifically. “Our argument is that [research methods] are performative. By this we mean they have effects; they make differences; they enact realities; and they can help to bring into being what they also discover” (Law & Urry, 2004, pp. 392 - 393, italics in original). By recognising gender issues in identity performances do I help to produce them?

“Power not only *acts on* a subject but, in a transitive sense, *enacts* the subject into being. As a condition, power precedes the subject” (Butler, 1997, p. 13, italics in original). Recognition works power through categorising and labelling students as particular types of mathematics learners and it also works power through recognition of students through other categories. But perhaps the most insidious form of this power is the way it works through the students’ own self-recognition. “Power acts on the subject in at least two ways: first, as what makes the subject possible, the condition of its possibility and its formative occasion; and second, as what is taken up and reiterated in the subject’s ‘own’ acting” (Butler, 1997, p. 14).

This means that if we recognise people in a certain way it may lead to them self-recognising in that same way. If we see girls as a ‘problem’ in mathematics learning they may come to see themselves similarly (Rodd & Bartholomew, 2006; Walkerdine, 1989). It is important to note that none of my research participants reflected on their mathematics learning in such a way as to suggest being girl meant being marginalised – not once in the 18 months of the study. This leads me to question: at what point is it useful and at what point is it further discriminatory to recognise a performance as being part of one’s gender identity?

Re-analysing Belinda’s identity performance to be that of ‘friend’ rather than ‘girl’ enables me to consider whether she was able, in this situation, to co-perform friend and good mathematics student. It appeared that this was a difficult co-performance and although she began with a good student performance she ended up drawn into performing good friend instead. Recognising Belinda’s identity in this

way enables a way forward, a consideration of how the stage of the classroom, the group organisation, and the teacher direction could be re-thought to enable her to co-perform good mathematics student alongside other identities important to her.

I do not wish to naively suggest that we abandon our recognition of gender in understanding marginalised mathematics identity performances. Indeed it is difficult to re-analyse Emily's situation (the first vignette) in another way. Even Belinda's performance of friend is in part constituted by and through her gender. Rather I wish to suggest that we consider carefully what gender recognition may achieve. In some cases recognising gender may blind us to other identity performances that impact on performing good at mathematics. And we must also be aware that recognising gender may lead to girls self-recognising in a similar way and writing themselves out of future mathematics performances.

References

- Barnes, M. (1998). *Analysing power relationships in collaborative groups in mathematics*. Paper presented at the Mathematics Education and Society conference, Nottingham, England. [Available at: MEScommunity.info].
- Burton, L. (2003). Introduction. In L. Burton (Ed.), *Which way social justice in mathematics education* (pp. xv-xxiii). Westport, CT: Praeger.
- Butler, J. (1988). Performative acts and gender constitution: An essay in phenomenology and feminist theory. *Theatre Journal*, 40(4), 519–531. doi: 10.2307/3207893
- Butler, J. (1997). *The psychic life of power*. Palo Alto, CA: Stanford University Press.
- Chronaki, A. (2013). Identity work as a political space for change: The case of mathematics teaching through technology use. In M. Berger, K. Brodie, V. Frith & K. le Roux (Eds.), *Proceedings of the Seventh International Mathematics Education and Society Conference* (Vol. 1, pp. 1–18). Cape Town, South Africa: MES 7. [Available at: MEScommunity.info].
- Cobb, P., Gresalfi, M., & Hodge, L. (2009). An interpretive scheme for analyzing the identities that students develop in mathematics classrooms. *Journal for Research in Mathematics Education*, 40(1), 40–68. <http://www.jstor.org/stable/40539320>
- Darragh, L. (2014). *Raising the curtain on mathematics identity: The drama of transition to secondary school* (Unpublished PhD thesis). University of Auckland, New Zealand.
- English, L. D., Jones, G. A., Bartolini Bussi, M., Lesh, R. A., Tirosh, D., & Sriraman, B. (2008). Moving forward in international mathematics education research. In L. D. English (Ed.), *Handbook of International Research in Mathematics Education* (2nd ed., pp. 872–905). New York, NY: Routledge.
- Esmonde, I. (2009). Ideas and identities: Supporting equity in cooperative mathematics learning. *Review of Educational Research*, 79(2), 1008–1043. doi: 10.3102/0034654309332562
- Esmonde, I., & Langer-Osuna, J. M. (2013). Power in numbers: Student participation in mathematical discussions in heterogeneous spaces. *Journal for Research in Mathematics Education*, 44(1), 288–315. doi: 10.5951/jresmetheduc.44.1.0288
- Goffman, E. (1959). *The presentation of self in everyday life*. London,

- England: Penguin.
- Gutiérrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, 44(1), 37–68. doi: 10.5951/jresmetheduc.44.1.0037
- Holland, D., Skinner, D., Lachicotte, W., & Cain, C. (1998). *Identity and agency in cultural worlds*. Cambridge, MA: Harvard University Press.
- Ingram, N. (2008). Who a student sits near to in maths: Tensions between social and mathematical identities. In M. Goos, R. Brown & K. Makar (Eds.), *Navigating currents and charting directions: Proceedings of the 31st Annual Conference of the Mathematics Education Research Group of Australasia* (pp. 281–286). Brisbane, Australia: MERGA.
- Law, J., & Urry, J. (2004). *Enacting the social. Economy and Society*, 33(3), 390–410. doi: 10.1080/0308514042000225716
- Lerman, S. (2012). Agency and identity: Mathematics teachers' stories of overcoming disadvantage. In T. Tso (Ed.), *Proceedings of the 36th conference of the International Group for the Psychology of Mathematics Education: Opportunities to learn in mathematics education* (Vol. 3, pp. 99–106). Taipei, Taiwan: PME.
- Mendick, H. (2005). A beautiful myth? The gendering of being/doing “good at maths”. *Gender and Education*, 17(2), 203–219. doi: 10.1080/0954025042000301465
- Mendick, H. (2006). *Masculinities in mathematics*. Maidenhead, England: Open University Press.
- Rodd, M., & Bartholomew, H. (2006). Invisible and special: Young women's experiences as undergraduate mathematics students. *Gender and Education*, 18(1), 35–50.
- Sfard, A., & Prusak, A. (2005). Telling identities: In search of an analytic tool for investigating learning as a culturally shaped activity. *Educational Researcher*, 34(4), 14–22. doi: 10.3102/0013189X034004014
- Solomon, Y. (2007). Experiencing mathematics classes: Ability grouping, gender, and the selective development of participative identities. *International Journal of Educational Research*, 46, 8–19. doi: 10.1016/j.ijer.2007.07.002
- Solomon, Y., Lawson, D., & Croft, T. (2011). Dealing with “fragile identities”: Resistance and refiguring in women mathematics students. *Gender and Education*, 23(5), 565–583. doi: 10.1080/09540253.2010.512270

- Stentoft, D., & Valero, P. (2009). Identities-in-action: Exploring the fragility of discourse and identity in learning mathematics. *Nordic Studies in Mathematics Education*, 14(3), 55–77.
- van Langenhove, L., & Harré, R. (1999). Introducing positioning theory. In R. Harré & L. van Langenhove (Eds.), *Positioning theory* (pp. 14–31). Oxford: Blackwell.
- Walkerdine, V. (1989). Femininity as performance. *Oxford Review of Education*, 15(3), 267–279. doi: 10.1080/0305498890150307
- Walkerdine, V. (1998). *Counting girls out: Girls and mathematics* (new edition). London: Falmer Press.