Article

Epistemological Shudders as Productive Aporia: A Heuristic for Transformative Teacher Learning

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Abstract

Epistemological shudders offer teachers and researchers a valuable heuristic to gain new perspectives on classroom dynamics. As a means for reflexivity, they involve turning one's reflexive gaze on discourse. Although this shudder metaphor has been used to produce puzzles and paradoxes to explore regimes of truth in early childhood contexts, it remains under theorised. The study's conceptual framework utilises Judith Butler's notion of performativity which precludes a prediscursive autonomous subject. Butler's view suggests that identity is a continuous process of reiterating and resignifying one's position within and across discourses. Through this performance repetition, an illusion of a stable fixed identity is created. In keeping with a view of poststructural research which troubles or disrupts the "taken for granted" in the interests of social justice, the approach to discourse analysis taken in this study supports a deconstruction of unproblematised classroom discourse. During a research interview, the use of a discourse analysis tool prompted epistemological shudders that enabled a teacher to review her beliefs about how she positioned students in her classroom and the researcher to problematise essentialist notions of agency. The study illustrates how epistemological shudders can prompt teachers and researchers to trouble unquestioned assumptions as part of a dynamic learning process.

Keywords: teacher education, poststructuralism, discourse, performativity, reflexivity, interview

The concept of an *epistemological shudder* can be a useful tool for researching, analysing, and revisiting everyday interactions to explore equity and social justice issues (Giugni, 2005, 2006; Leafgren, 2009; MacNaughton, 2005). An epistemological shudder is a paradox which opens up possibilities for sense making. It entails the "cracking apart" or "fragmentation of contextual understanding" (Giugni, 2005, p. 83). Like a "critical incident" (Flanagan, 1954, p. 338), "disorienting dilemma" (Mezirow, 1990, p. xvi), or even an "aha moment" (Kounios & Beeman, 2009), this dissonance can serve as a catalyst for teacher learning and continuing professional development. As a heuristic, epistemological shudders can enable teachers and researchers to decontextualise what is "taken for granted" and illuminate new understandings to enhance practice. Initially these shudders can cause a period of confusion or anxiety (aporia) when what has been taken for granted no longer makes sense. In Ancient Greek, aporia involved doubt, perplexity, and that which is impassable (Aporia, Merriam-Webster's Online Dictionary).

The "productive aporia" in the title above is an oxymoron that combines both technicist notions of professional development, where the convergent focus is on outcomes, and the psychological spaciousness (Garvey-Berger, 2012) required for teacher learning which honours ontological pluralism and divergent possibilities. This article conceptualises teacher learning as complex and nuanced, a contrast to the politically expedient models utilised in technical rational approaches to teacher improvement (Kennedy, 2005). Poststructural theory destabilises notions of linear progress and the elusive promise of clarity.

Work presented in this article emerges from a doctoral thesis which is positioned in the theoretical landscapes of socioculturalism and feminist poststructuralism. The wider research comprises a rhizotextual analysis of learner agency in two Year Nine classrooms. The dynamic poststructural view of agency theorised is derived from Judith Butler's (1993) notion of performativity which precludes any prediscursive autonomous subject. The research explores how learners take up agentic positions as they shift subjectivities in discourses. Central to this focus is the question of *how* students and teachers can move from one set of culturally and socially structured subjectivities to another. In particular, this article addresses the dynamics of the reflective dialogue which stimulated epistemological shudders during a teacher interview. In my role as an in-service teacher educator (ISTE), I facilitated continuing professional development on Assessment for Learning (AfL). While many definitions of assessment for learning prevail, I draw upon a short, second-generation definition: "Assessment for Learning is part of everyday practice by students, teachers and peers that seeks, reflects upon and responds to information from dialogue, demonstration and observation in ways that enhance on-going learning" (Klenowski, 2009, p. 264). I had an ongoing relationship with the teachers, where we focused on coaching AfL through reflective dialogue. Reflective dialogue is a process of making time and space to engage with the ideas of others. Freed (2003) considers that it does not occur often and that in order for it to take place it is important to develop and nurture the capacity for four behaviours: suspending judgement, voicing issues, listening actively, and respecting others.

Reflective practice is a long-standing cornerstone of teacher professional learning (Brookfield, 1995; Brookfield & Holst, 2011; Loughran, 2005; Schön, 1983). Argyris and Schön (1974) contend that a dialogic approach to teacher learning can support practitioners to surface their espoused theories of action and juxtapose them with their "theories-in-use" (p. 7). Challenging this constructivist view, Barad (2003) advocates a move from "representationalism" (p. 802), where the focus is on describing reality, to performative alternatives that forefront issues of ontology, materiality, and agency. She critiques social constructivist approaches for getting "caught up in the geometrical optics of reflection where, much like the infinite play of images between two facing mirrors, the epistemological gets bounced back and forth, but nothing more is seen" (p. 803). Diffraction constitutes a wave-like pattern which alters once it passes through an

opening or obstruction (Barad, 2003; Jackson & Mazzei, 2012). Barad (2011) shifts the focus from reflection to questions of diffraction, proposing a "diffractive methodology—a practice of reading insights through one another while paying attention to patterns of difference" (p. 445).

In this research an epistemological shudder during an interview prompted an experienced teacher to question how she construed learner agency. This afforded her an opportunity to rethink how she positioned a student whose behaviour she found challenging. The occurrence was also a catalyst for researcher reflexivity in that it prompted a shake-up and shift in my thinking about how learners can be constituted agentically in discourse. These epistemological shudders trouble a liberal humanist view where agency is something that teachers can impart to their students as a form of empowerment. The shudders outlined in this article illustrate a process that can support pedagogical awareness in teachers and reflexivity in researchers. St. Pierre (1997) argues that ethical reflexivity can enable us to theorise our own lives and examine the frames through which we read the world, thus moving towards "an ongoing validity of response" (p. 186). The sphere of schooling improvement within which I was working at the time of this research was laden with liberal humanism. This was evident in the emphasis on peer surveillance or deprivatised practice and teacher accountability, with its focus on quantitative over qualitative outcomes. In short, neoliberalism was embedded in the day to day discourse of teachers and in the educational policies they were enacting. This research seeks to shift the frame from a reductionist view of teacher professional development by illustrating an ethically reflexive, rich, and emergent example of teacher learning.

The article first reviews literature on epistemological shudders as productive aporia and addresses issues of ontology. Then, connections between identity and agency, governmentality and agency, and counterscript and underlife will be demonstrated. Finally, the research method and analytical approach are outlined before the findings are shared and discussed in accordance with samples of data.

A Productive Aporia

During the research I experienced jolting doubt and perplexity when there appeared to be an obvious paradox or contradiction in my understanding. Moments of confusion like these, which are the result of unexpected information, can be characterised as epistemological shudders. Lozinski and Collinson (1999, as cited in Giugni, 2006) were the first to employ the concept of an "epistemological shudder" to describe how one's preferred representations of one's known world can prove incapable of immediately making sense of the "marvellous" (p. 101). This describes something out of the ordinary or unexpected. Through these opportunities, games of truth (Foucault, 2007; Stickney, 2012), as rules for truth production (Peters, 2004), can be shattered and fragmented. For teachers, games of truth are discursive constructions that talk students' subjectivities into being. Epistemological shudders challenge these contextually located truth regimes.

Giugni (2005) describes how epistemological shudders comprise a two-phase process. First, there is a phenomenological experience of the unexpected and chaotic. This initial experience of chaos can result in an experience of aporia. Jacques Derrida used the term aporia to refer to blind spots in any metaphysical argument (Graham, 2005). Giugni (2005) assures us that aporia does not last; instead, to reach new understandings, meanings must become reconstituted. Second, the cognitive process of "placing" the new knowledge within the displaced and fractured contextual understanding occurs: "A representation can always and must always be found to assuage the shudder. Here, the epistemological shudder offers an understanding of how we deliberately come to experience uncertainty" (Giugni, 2005, p. 83).

During her ethnographic study within an early childhood centre, Giugni (2006) recognised that students experienced epistemological shudders as they performed identities. Giugni (2005) observed how unexpected words can cause a reaction that may make us feel uncomfortable, displaced, and almost paralysed, not knowing where to place this new information. Importantly, once a scenario becomes fragmented an epistemological shudder can evoke a new way of looking at things (MacNaughton, 2005). It can be likened to what Mazzei (2009) describes as a poststructural crack where the known is split apart. The theories which surface are often contradictory; however, they can be deliberately used to create points of resistance in order to theorise everyday practice (Giugni, 2005).

Epistemological shudders occur in liminal spaces. The liminal is a space of becoming in between one state of being and another, where one is working at the limit or the edge of self (Somerville, 2007). Liminality has its origins in anthropology discourse. Early studies of ritual passages suggested that they were characterised by three steps undertaken by the subjects of initiation (initiands): (1) separation; (2) liminality; and (3) reintegration:

> Initiands live outside their normal environment and are brought to question their self and the existing social order through a series of rituals that often involve acts of pain: the initiands come to feel nameless, spacio-temporally dislocated and socially unstructured. Liminal periods are both destructive and constructive, as the formative experiences during liminality will prepare the initiand … to occupy a new social role or status, made public during the reintegration rituals. (Thomasson, 2012, p. 322)

This view of liminality suggests that learners experience a sense of detachment and disorientation (much like an epistemological shudder) before they take their new place in society. Therefore epistemological shudders can be likened to a rite of passage where there is a sense of anchorlessness and confusion before new understandings are generated. This was apparent in the teacher interview. The interview dialogue afforded liminal space for the teacher to address the confusion and contradictions in her understandings.

Ravenscroft, Wegerif, and Hartley (2007) consider that the boundary between participants in a dialogue is not a demarcation line, or an external link between self and other, but an inclusive "space" within which self and other mutually construct and reconstruct each other. In 1998, Smyth argued that schools need to make "enunciative space" (p. 191) for teacher leadership and learning. In these spaces teachers can challenge, share, and reconstitute pedagogical knowledge and understandings. "Dialogic space" is where time is set aside and contexts found so that pedagogical conversations can occur and crucial "teacher talk" is not left up to chance (Smyth, 1998, p. 199). Dialogue in liminal spaces can afford what is unseen to become seen. Garvey-Berger (2004) maintains that in this transformative space at the edge of people's understanding fertile change can occur:

> If we listen for the confusion at the edges of understanding, we can find the most fertile ground for transformation. Looking for such moments and recognizing them for what they are—the edge of a person's understanding—allows us to slow down and honor transformative spaces. Understanding pieces of the transformative journey allows us to be more thoughtful and intentional guides, and as we provide encouragement and company for [learners] to enter into this liminal zone, we encourage the kind of transformational reflection that leads to new possibilities for action. (p. 350)

Just as epistemological shudders can add a dimension of reflexivity in schools, so too can this occur in research when contradictions are surfaced and new understandings are awakened in

researchers. Krumer-Nevo and Sidi (2012) argue that reflexivity acts against the authoritative stance of the text or the researcher. By bringing to the forefront their own feelings, experiences, and history, researchers can demonstrate their processes of interpretation: "Reflexivity can both enhance the interpretation by adding a new source of knowledge and emphasize the status of the text as personal and partial" (Krumer-Nevo & Sidi, 2012, p. 301). This notion of partiality is further reflected in the research ontology in that the descriptions of the participants and their actions given in this research do not provide a definitive account of them in any essentialist sense.

Ontology—Shards of Truth and Partial Selves

My descriptions of teachers and students in this article convey mere shards of truth. Like Sermijn, Devlieger, and Loots (2008), I consider that this research text is but one of the many possible presentations. Although we can speculate about how people are situated in discourse, we can never really know in any objective sense. Lather (1991, 2007) uses the term "ambivalence" to highlight the instability, contingency, and partiality of what we know. Rejecting notions of truth, fixity, knowledge, and authenticity in her representation of her research participants, Mazzei (2009) urges us to "seek the messy, opaque, polyphonic; a voice that exceeds easy knowing and quick understanding" (p. 50). Through grappling with this messiness at the boundaries of understanding, both researchers and teachers can work in new ways, authoring new possibilities for themselves and others (Mazzei, 2009). In Mazzei's (2009) research, she describes a relistening or a "listening at the limit," which may enable researchers to detect destabilised voices:

> I turn a focus not on what is evident but a return to Deleuze's notion of the crack that happens on a new line and how a noticing of the crack produces a listening that can no longer be ignored. It is this imperceptible crack through which the destabilized and silent voices slip. A listening at the limit then does not ignore the hairline fractures, but notices the pain and uncomfortableness present within them. (p. 55)

To address the legitimacy of this study, I draw from Lather's (1986) "catalytic validity" (p. 70). Catalytic validity is the degree to which the research process re-orients, focuses, and energises participants' perceptions of reality. It is based on the Freirean notion of conscientization (Freire, 1985) in that it offers a collaborative, praxis oriented approach to ensuring research quality. Lather (1986) argues for the need to consciously channel this impact so that respondents gain self-understanding and, ideally, self-determination through their research participation. Lather (2007) advocates that researchers interrogate their representations by reflexively exploring their own practices to make explicit which regime of truth they locate their work within. She describes validity after poststructuralism as a "space of constructed visibility of the practices of methodology" (p. 120). It is a doubled movement to mean "all of the baggage that it carries" as well as "what it means to rupture validity as a regime of truth" (Lather, 2007, p. 118). The emphasis is shifted from the real to "discourses of the real" (Britzman, 1991, p. 195). These discourses subscribe to the prevailing order and privilege the status quo. Lather (2007) points out that "it is not a matter of looking harder or more closely, but of seeing what frames our seeing—spaces of constructed visibility and incitements to see which constitute power/knowledge" (p. 119).

Identity and Agency

As this research is premised on social justice, it would be paradoxical not to engage in a methodology that afforded teachers and students opportunities to be agentic. Agency is a performative notion where subjects take up subjectivities and are relationally constituted by

others within and across discourses. Butler's (1993) performativity challenges the liberal humanist notion that identity is a stable, totalising entity. The notion of a fixed identity is rooted in modernist discourse. In this article, I regard "identities" to represent categories that are the product of social discourse. Therefore, due to the flux and fluidity of social landscapes, identities are sites "of permanent openness and resignifiability" (Butler, 1992, p. 160). Discursive practices can constitute the speakers and hearers in certain ways, yet they are also a resource through which speakers and hearers can negotiate new positions (Davies & Harré, 1990). In these spaces, subjects reflexively position themselves and, in turn, can be afforded agentic subjectivities through socially mediated interaction. Subjects are constituted in and through discourses and are not determined by them.

Although identities are fluid, they can develop an appearance of stability through "a stylized repetition of acts" (Butler, 1990, p. 140) where the illusion of a stable fixed identity is promoted, perpetuated, and believed (Jagger, 2008). Butler's view suggests that subjectivity is a continuous process of reiterating and resignifying one's position within and across discourses. Subjects take up positions through performance repetitions, which develop an appearance of "reality," as if they are stable and solidified (Applebaum, 2010). Applebaum (2010) points out that subjects can unwittingly become complicit in sustaining hegemonic social structures. For instance, teacher and student subject positions are produced through effects of power and as such they take up their positions in discourse. Discourse moves are where teachers and students resignify and destabilise discourses in classrooms.

Neoliberal Governmentality and Agency

The unified, rational subject, which is described by Davies (2010) in her later work as the "subject-of-will" (p. 54), is embedded in the notion of neoliberal governmentality. Davies (2010) identifies how, within neoliberalism, individuals must become chameleons, "able to appear to be whatever a particular workplace wants, able to change in whatever way the workplace deems will maximise its productivity, ready and willing to move on to a new workplace if the old one no longer needs it or finds it valuable" (p. 65). There is an economic imperative that sits behind the curriculum drive for learner agency as well as a social justice aspect. In neoliberal discourse agentic individuals can develop the competencies to compete for limited jobs and resources. In this discourse, individual identity is a means of gaining recognition, competing against others, and being seen to have value, which ironically, can make individuals both more vulnerable and less capable of agency:

> The subject-of-will chooses, and in that sense has agency; but its choice is between one already known, over-determined alternative, and another. It understands its choice as coming from within itself and is blind to the ways in which that choice is driven from, or made possible by, forces outside itself. Those forces are difficult to critique since they are read as "my own" coming from "who I am." (Davies, 2010, p. 66)

From a poststructural perspective, learner agency is an important element in the development of a society of critical thinking citizens who can critique the work discourses do on them and through them (Davies, 2010). For Davies (2010), the subject-of-thought, in contrast with the subject-of-will, is not so focused on thought's possibilities as on what may emerge through thought. The agentic learner stands back from thought to see what it assumes and what it might accomplish and to imagine how it might differ. He/she critically examines thought and generates new thinking, using not just intellect but also imagination and the senses. Davies (2010) suggests that the capacity for agency is heightened when learners listen to the other, participate in and generate events with others "that are capable of dismantling the inevitabilities of dominant, oppressive

thoughts and practices" (p. 66). The epistemological shudder event outlined in the research findings provided an opportunity to shift the focus from the neoliberal subject-of-will, to critique assumptions made about learners, learning, and the nature of learner agency. The concepts of counterscript and underlife, addressed in the next section, can help us make sense of how power plays out through discourse as students undertake their "dismantling" project.

Counterscript and Underlife

The notions of counterscript and underlife are significant elements in the classroom discussed in this study and an important feature of the analysis. Gutiérrez, Rymes, and Larson (1995) observe that while some students contribute to and participate in the teacher script, those who do not comply with the teacher's rules for participation form their own counterscript. They note that although members of a classroom community hold varied expertise in the form of local knowledge, the inscribed knowledge of the teacher and classroom regularly displaces the local and culturally varied knowledge of the students. This displacement of student knowledge creates the space for student counterscript to develop. Drawing from Mikhail Bakhtin's notion of social heteroglossia, Gutiérrez et al. (1995) described how classrooms are inherently multi-voiced. Social heteroglossia emerges in counterscript and reflects the inherently multi-voiced and dialogic nature of any classroom (Gutiérrez et al., 1995). Referring to Goffman's work, Gutiérrez et al. (1995) defined underlife as the range of activities people develop to distance themselves from the surrounding institution. These are actions that students take in response to teacher-dominated classroom discourse. Underlife activities can take two primary forms: a disruptive form "where the realistic intentions of the participants are to abandon the organization or radically alter its structure" and a contained form in which the participants attempt to conform to "existing institutional structures without introducing pressure for radical change" (Goffman, 1961, as cited in Gutiérrez et al., 1995, p. 451). While student underlife develops freely in all classrooms, Gutiérrez et al. (1995) note that rarely is such activity incorporated into instructional practices. Therefore, despite the inherent multi-voicedness of any classroom, student underlife generally maintains traditional classroom power relations.

Method

In my capacity as an ISTE (in-service teacher educator), I facilitated Assessment for Learning professional development which aimed to promote effective pedagogy as outlined in the New Zealand Curriculum (Ministry of Education, 2007). Although this research is located in a Year 6–12 College where I worked with a team of lead teachers, the professional development and research were kept separate for ethical reasons. Taking a poststructural view, I acknowledge that, along with the teacher and student participants, I am constructed by and, in turn, act upon discourse. I cannot be neutral or objective and therefore I act with a purpose and a desire to engage people respectfully and support the discursive constitution of agentic subjectivities. I gained informed consent from the school principal, teacher, and student participants and commenced fieldwork in the school. The two teachers I worked with were a purposive sample. They both expressed desire to participate in the research, as they were interested in strengthening learner agency in their classrooms.

This doctoral study utilised a Deleuzo-Guattarian methodology (Deleuze & Guattari, 1987) to map agency in the two classrooms. Poststructural discourse analysis sheds light on the micro- and macro-level discourses (Gee, 2011) and reveals how learners accept invitations to identity positions and, in turn, are discursively located by others. Discourses and identity are important theoretical and analytical ideas through which I conceptualise agency. In the analysis, I adapted tools of inquiry devised by Gee (2011): a "big D discourse tool" (p. 176) and an "identities

building tool" (p. 106). These tools are key questions which supported the exploration into how subjectivities were "relationally constituted" (Drewery, 2005, p. 305) in the specific classroom discourses.

In the spirit of reciprocity, the opportunity also enabled the teachers to consider their own classroom dynamics, thus supporting catalytic validity. The teacher interviews, which incorporated student interview data and videoed episodes of classroom interactions, lasted for approximately an hour. The teachers had the time and space to speak at length and to reflect on their practice. Through reviewing the transcripts of the teachers' reflections on the episodes, I identified a range of discourses in play. This article is specifically concerned with the data from one teacher interview which I analysed to identify how discourses were deployed and students were positioned in the classroom. Jan's [a pseudonym] interview is of particular interest in this article because it illuminates both teacher and researcher reflexivity.

Jan is an experienced science teacher and during our reflective dialogue (interview) we used Gee's (2011) discourse analysis "frame problem tool" (p. 31). The frame problem itself raises the question: "How do we know that we won't learn more that will make us doubt what we thought people meant?" (p. 32). By broadening the contextual frame, for example through viewing more videoed classroom material, meanings can change and extra layers are added to an analysis. This tool modifies the meanings attributed to language as the context becomes more complex. During our dialogue, Jan made sense of her students' actions, a process which triggered epistemological shudders for us both. She viewed two clips of classroom video footage. The second widened the frame or scope of reference and proved to be a catalyst for Jan's epistemological shudder. While the "frame problem tool" can be a way to judge validity of an initial discourse analysis (Gee, 2011), in this instance it offered Jan an opportunity to shift how she discursively positioned one of her students. Through viewing one DVD clip after another, Jan rethought her initial impressions and recognised that her assumptions were flawed. Her "truth" was fractured apart, which lead to a moment of aporia for her.

Jan's Epistemological Shudder

The following dialogue with Jan took place after a classroom episode where a group of students, contrary to Jan's instructions, instigated their own investigation at the back of the classroom. During the lesson, Jan intended that all the students would investigate the effect of solar energy on different coloured surfaces outside. However, a group of boys gathered around a sink at the back of the classroom to see what effect tap water would have on the temperature readings of their thermometers. Despite Jan's appeals, three boys, Blake, Thor, and Hone [pseudonyms], remained at the sink until finally Jan approached to redirect them to the experiment outside. Blake is the main focus in the video footage as he was at the sink consistently as the other boys drifted in and out. Blake consented to allow me to share his recorded data with Jan.

During our interview dialogue, Jan listens to Blake's audio recording and then watches three excerpts of videoed classroom interaction. Initially, when Jan listens to him speak about solar energy she is surprised that he can identify the learning intention and content. She is amazed at how he positions himself as a learner because she finds his counterscript behaviour very challenging. Jan does not anticipate such an informed and thoughtful reflection:

> If you hadn't have played me this I would have thought he would have got absolutely nothing out of that learning. He is very quick to say who is in charge of the learning [pause]. At first he said it was me and then very quickly he said Oh—no actually it's us— and our teacher just kind of directs it.

In the footage on the first DVD, Blake focuses intently on his thermometer. Jan does not recognise the student initiated investigation so she does not realise which lesson the clip is from:

> … or maybe he was I don't know. I can't quite see maybe he was designing something. Maybe he was doing his own thing with it.

Initially, she notices that Blake trials to find out how the thermometer works:

> He is experimenting by himself with a thermometer. Ahh Ok. Sorry I am on a different lesson. He's trialling and looking how the thermometer works. He's being quite careful with it—which is good.

As Jan views the second DVD clip, she watches herself approach the boys to redirect them to their experiment outside where they were supposed to be looking at the effect of solar energy on different surfaces. It then dawns on Jan that Blake, who is so focused on his investigation, is actually a member of a group of students who are participating in counterscript. She realises that Blake is executing his own alternative investigation and is not undertaking the practical science task that she had planned for the class:

> There were quite a few of them who were going in and out and putting their thermometers under running water and weren't setting up the practical I had intended them to do.

Jan realises that Blake's initiative contravenes her lesson. Through foregrounding the lesson with the use of the frame tool, Jan is challenged to look at the incident differently. What she initially thought was focused learning behaviour now appears to be rebellious and off task. Nevertheless, Jan recognises that, although Blake is not doing what she wanted him to, he is still learning. It was classroom learning that Jan did not intend to happen, although in hindsight Jan said she could have planned for it:

> I thought, oh, I should have actually planned for this. Planned for them to experiment themselves with the thermometers. So just the guidelines about it and reasons why and then just let them do what Blake is actually doing. 'Cos he was very focused on what he was doing.

Although she identifies that the students are learning, Jan struggles to see these rebel actions as learner agency:

> Jenny: [author] What agency are you noticing?
> Jan: Their prior knowledge about thermometers. They knew they measure hot cold—or measure the temperature. And in that particular lesson I should have—but I allowed them to do that. They took it on themselves—or he did anyway—to do some trials with the thermometer. Measure some temperatures and have a good look for them.
> Jenny: Is that agency to you that he has gone and trialled it himself?
> Jan: Yeah borderline. But … [pause]
> Jenny: Why do you say borderline? Why is it not?
> Jan: Because I hadn't—that wasn't part of the lesson that I had in mind—that I had planned.

Jan acknowledges that Blake was investigating yet she struggles to see the episode's worth as an example of agency. Jan expects something more overt and "wow" as an example of agency. By using the word "unplanned" in her explanation of why she found the thermometer incident hard to reconcile, she highlights how student initiated learning can challenge teacher authority:

> I guess he's investigating. But I find it really hard to [reconcile it]. … Because you are looking at a short simple recording of an incident that happened—unplanned—and I think sometimes agency—you are looking for something kind of "Wow." Like it really hits you. And you think Wow! That's agency. I know its agency. So looking for things that are small. I find it really hard to say that that little small thing there is agency.

Jan expects agency to be an event, something obvious and big. She initially finds it hard to look beyond Blake's resistant behaviour. It is jarring for Jan to see counterscript as an example of agency. In this moment the aporia, a puzzlement and confusion, surfaces as this is not what she is expecting to see. Jan comments on the difference between my perspective of this example of agency and her perspective:

> It is just that I am actually having trouble seeing this particular bit. Perhaps I am not seeing what you see [pause] you see I am finding this complicated. This is more complicated to try and draw out the agency to see it.

At this stage of the interview, in order for Jan and me to explore agency further, I share a third piece of video footage, which is from another science lesson in which another group of Jan's students are engaged in a set task of making their own thermometers. This group of students are seated at a table and diligently working together. Far from accepting this scene as a preferred model, which is what I thought she would do, Jan uses the footage to contrast the two examples. Through the juxtaposition of the two scenes, Jan enters an epistemological shudder resolution phase and in doing so clarifies what she thinks. Through this process, Jan acknowledges a shift in the way she theorises agency. As she reflects on the initial episode, Jan sees how agency is evident there:

> OK so I can now see more agency happening with the previous clip with Blake.

The contrast of the second example reinforces Jan's new understanding, which is afforded through her epistemological shudder. Surprised by Jan's shift I respond:

> Do you? Ok. These people seem to be agentic 'cos they are engaged.

However, Jan challenges the connection I had made between agency and engagement:

> Does engaged [mean agency]? But that activity is just [where students are] following a recipe on what to do. Is that agency? Is that teacher agency?

Jan facetiously uses "teacher agency" to describe transmissive teaching. For Jan, "teacher agency" or "teacher lust," as she puts it, is the teacher's desire to be the centre of attention as a "knower" and to provide answers for students without giving them opportunities to think and engage in dialogue. Jan critiques her own power desires, observing how a prescriptive approach does not enable her students space to initiate learning. Jan struggles to find the words at the time to frame her new understanding. This suggests the second part of the shudder where the cognitive process of "placing" the new knowledge within the displaced and fractured contextual understanding is occurring:

> So I can see, although I cannot word it, I can see the agency there compared to what you showed me. Compared to them making their thermometers. 'Cos agency has to come from within them. It's their thing. Whereas that other clip—sure there are three of them there. And they are engaged [pause] you know, but it is very prescriptive. They have a recipe to follow—behind them on the smart board. But then they are choosing to do it. So there is agency in there but there is more in there maybe?

Jan shifts how she positions the students as her shudder is assuaged. Although they appear to be engaged in an act of resistance, Jan sees that they are not subversive and are participating in a form of science discourse by initiating their own investigation:

> They weren't sat there making paper darts or drawing on the desk or anything. They had just designed their own investigation and had chosen not to do the investigation I had designed for them.

Through her epistemological shudder, Jan recognises that students engaging in counterscript can also be learners. She points out that when learners initiate learning which is relevant to them they can be agentic:

> I am still hanging onto the fact that it has to come from the individual. Blake valued what he did more than what I had asked them to do … And [in] that particular lesson [pause] they took it on themselves—or he did—to do some trials with the thermometer. Measure some temperatures and have a good look for them.

Jan sees that she could have enabled the students opportunities to cue their prior knowledge by giving them scope to experiment with the equipment. Nevertheless, she recognises that they first need to have guidelines so that they understand how to work with thermometers in order to preserve the class set:

> Just give them some guidelines on—'cos there are some guidelines for the use of thermometers—so that we still have a class set of thermometers at the end of the period. So just the guidelines about it and reasons why and then just let them do what Blake is actually doing. 'Cos he was very focused on what he was doing.

Discussion

The students' counterscript discourse, so important to Blake's peer relationships, was initially described by Jan as a hindrance to learning. In the first instance, Jan found Blake's concentration on his thermometer in the video and position as a "good" science learner in his interview difficult to reconcile with her regular citation of him as an easily distracted student. When she realised in the second clip that the video footage was an episode of counterscript, Jan experienced her epistemological shudder. In keeping with Butler's (1993) theory, Blake was a performatively constituted subject who was resignified in discourse though the reflective dialogue. When Jan noted that Blake was so absorbed with his investigation and that he valued it more than her planned lesson, she shifted in how she discursively constituted Blake, from resister to learner. Through this epistemological shudder, Jan picked up the fragments of her previous perceptions and reconstructed them, which enabled her to shift her view of learner agency. In the process, Jan realised that teenage counterscript was not antithetical to learning.

Jan's epistemological shudder transcended the geometrical optics of reflection by facilitating a diffractive move (Barad, 2003) where she troubled her thinking about the nature of learner

agency. Jan's epistemological shudder challenged her to review how she saw student learning in her classroom and the nature of learner agency. The interview dialogue offered transformative space (Garvey-Berger, 2004), which triggered Jan's understanding of agency to be cracked apart. The expanded context of the second video as a frame tool (Gee, 2011) enabled her to problematise how learning happens in her classroom. As Jackson and Mazzei (2012) point out, "a diffractive reading is not about what is being told, or experienced—it is the ways in which what is experienced is formed in the intra-action between the material and discursive" (p. 130). The performance of Blake's subjectivity is an example of how discourses can materialise. Rather than eliciting a reflective experience, the intra-action of the dialogue enabled Jan to undertake refractive analysis.

The findings illustrate how "refractive practice" can enable teacher agency; in this instance, the teacher was able to bring discourses together and reposition herself. When Jan contrasted the two scenes she collapsed the oppositional binaries of counterscript and science classroom discourses. For Jan, this learning was transformative. Through the resulting aporia, she reconstructed a fresh way to look at learner agency. In comparing two recorded episodes of classroom footage, Jan saw that the students who resisted her positioning to initiate their own investigation were more agentic than the students who compliantly followed her set investigation. She noted that the students made a decision not to "do the plan" as she had intended. Through viewing the video footage of compliant students "following a recipe," she critiqued her own power desires and conventional schooling discourse, where learning is predominantly directed by the teacher. Although Jan's comment, "They made the choice that they weren't," can be conceived as a discourse of responsibilisation—Davies (2006) uses the term "responsibilisation" (p. 436) to describe neoliberal forms of government which require individuals to accept responsibility for self and to participate in acts of surveillance and control—it also suggests that Jan acknowledged how the students resisted the subjectivities on offer and, in effect, took up agentic alternative positions. By noticing the paradox between the students who were "following the recipe" and the active learning of the students who were engaging in counterscript, Jan constituted Blake as an agentic learner.

Blake's enactment of a scientist subjectivity during his investigation contradicted his regular student identity Jan expected. The nature of our dialogic relationship afforded Jan transformative space to reflect on the underlife in her classroom. In the process, she grappled with the messiness in the liminal space at the edge of her understanding. Although another teacher may have been confronted by this exploration of underlife, Jan was willing to look beyond Blake's counterscript that challenged her authoritative position as the teacher. She recognised that Blake and his peers were learning on their own volition through designing and implementing their own alternative investigation. Jan's epistemological shudder was, in essence, a swing in subjectivation. As highlighted earlier, Butler's (1993) notion of performativity precludes any prediscursive autonomous subject. The epistemological shudder in this interview interrupted Jan's citation of Blake as an off-task non-learner. The findings highlight how Jan's perception of him was troubled when she saw and heard the conflicting data. In effect, the interview interrupted the performance repetition of identity which had become Jan's reality of how she saw Blake.

As alluded to earlier, subjectivities can shift as learners take up, refuse, or exploit the invitations extended to them in classroom discourses. Blake's position is by no means fixed in this narrative as there is no closure to this episode, just a poststructural crack that suggests a possibility for further resignification.

St. Pierre (1997) argues that ethical reflexivity can assist us to theorise our own lives and examine the frames through which we read the world, thus moving us towards "an ongoing validity of

response" (p. 186). The sphere of schooling improvement within which I was working at the time of this research is laden with liberal humanism in the day to day discourse of teachers and in educational policies. On a daily basis, learners are attributed fixed identities and framed as free agents who possess the power to act autonomously, independent of discourse. As a researcher, I was inevitably drawn back into that discourse, often without realising it.

When Jan questioned the legitimacy of the agency performed in the second example of DVD footage, I challenged my own understanding of agency and questioned my selection of this science classroom episode as a relevant example. When I shared the second DVD clip of presumed agency with Jan and she queried whether the students "following the recipe" and "doing the plan" could be described as agentic, I also felt that my understandings were "cracked apart." Once my confusion that followed Jan's comment abated, I began to see agency as more complex, encompassing numerous and sometimes fleeting identity positions and acts of resistance. I had to reconstruct my understandings because my previous view would no longer suffice. Through a dialogic process that allowed for liminality and aporia, I reconstructed my view of agency, recognising where a liberal humanist interpretation would not suffice. I could see the vestiges of liberal humanist discourse that lay unproblematised and through this process conceived of a more performative view of learner agency.

In a spirit of optimism, Honan (2010) writes that "teachers can avoid the rip and swim against the tide of commonplace and taken-for-granted assumptions" (p. 33). Our swim led both Jan and me to experience epistemological shudders that caused us to pause and try to put the pieces back together, to make post-shudder pictures that we could understand better. The epistemological shudder interrupted how Jan positioned Blake and prompted her to rethink how she viewed learner agency. Although underlife develops freely in all classrooms, by its very nature it can be difficult to recognise. This study provides a vivid example of the "contained form" of underlife (Gutiérrez et al., 1995), and through the use of the frame tool (Gee, 2011), Jan was able to unsettle her traditional classroom power relations. It is paradoxical that underlife learning can be so productive and yet such a potent place for learner initiated learning. The epistemological shudder in this episode troubled "discourses of the real" (Britzman, 1991, p. 195). Jan looked closely at her classroom underlife to problematise the embedded power structures which determined how her learners were discursively constituted.

Conclusion

Epistemological shudders offer teachers and researchers emergent possibilities for reflexivity and transformation. By noticing, recognising, and responding to epistemological shudders assumptions can be problematised. This reflexivity sees the researcher, as well as the researched, discursively subjectivated, located within "games of truth." When we listen closely to discourse we can detect the cracks in the game. An epistemological shudder can be a useful analytic lens that can enable researchers to surface contradictions between epistemologies. The shudders, outlined in this article, prompted a cracking apart or fragmentation of contextual understandings. However, to gain from the experience, it requires the willingness to endure pain and discomfort when epistemologies shudder and crack. Through relating how these shudders can challenge existing beliefs, this research has implications for both researchers and educational practitioners. In stimulating productive aporia, epistemological shudders can afford teachers a heuristic for transformative learning. Although Gee's (2011) frame tool was a catalyst for reflexivity in this instance, the diffractive process cannot be contrived. There is scope for further research in this area to illustrate this profoundly rich experience. In an era when research participants are too often portrayed as having inadequate capabilities to look beyond the surface so that they can generate their own critiques and theorise the struggle between equality and inequality, I contend

that we need professional learning that honours teachers and affords liminal space to grapple with epistemological issues that matter deeply to them. Through listening at the limit, both researchers and teachers can be responsive to poststructural cracks as productive tensions and open to aporia as a necessary confusion for profound learning to take place.

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