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“I’M TELLING!”: EXPLORING SOURCES OF PEER AUTHORITY DURING A K-2 COLLABORATIVE MATHEMATICS ACTIVITY

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Abstract

This article draws from a study on the construction of authority relations among K-2 students across 20 videos of collaborative mathematics partnerships, from three classrooms in one elementary school. Drawing on positioning theory, we explore how authority relations between children affected collaborative dynamics. In particular, we trace how children drew on both adult and peer sources of authority and the effects on peer interactions during collaboration. Through three vignettes, we show how students’ deployment of adult authority through the perceived threat of getting in trouble can overpower peer resistance and shut down possibilities for shared work. We also show how peer resistance was productively sustained when the threat of getting in trouble was less directly connected to the teacher, and instead students positioned themselves and one another with intellectual authority.

Keywords

authority relations, collaborative mathematics partnerships, positioning theory

Introduction

Student-led collaborative learning, like all social activity, involves relationships of power among members of the classroom community. Social and relational processes, such as turn-taking, shared attention, the establishment of intersubjectivity, and the uptake of ideas, are affected by forms of power such as status (Cohen & Lotan, 1997) and authority (Langer-Osuna, 2011, 2016). These relationships can shape not only who participates and in what ways (Wood, 2013), but also the nature of the mathematical discussions (Esmonde & Langer-Osuna, 2013), the construction of a mathematical solution (Kotsopoulos, 2014; Langer-Osuna, 2016), and the development of identities as learners (Anderson, 2009; Bishop, 2012). Yet, the study of power in peer-led collaborative learning has been relatively small in comparison to other social, relational, and cognitive processes.

The early elementary years are a time of both introduction to schooling and significant changes in children's socio-emotional development. Studies of how young children come to dominate social situations reveal both prosocial and coercive ways they garner influence with peers (Bohart & Stipek, 2001; Hawley, 2002; Lease et al., 2002; Ostrov & Guzzo, 2015; Pellegrini et al., 2007). Ostrov and Guzzo (2015) found that the most influential children were the ones who readily shared with others and did so in the absence of a teacher directing them to do so. These findings suggest that the construction of influence among peers can promote or disrupt possibilities for productive and equitable collaborative learning, depending on the strategies deployed. Positioning theory shifts the analytic focus from the particular strategies deployed to, instead, a focus on how discursive moves position students in relation to particular rights and obligations, including the right to manage others or the obligation to obey (cf., Langer-Osuna, 2011).

This chapter examines relational power from the perspective of positioning theory (Davies & Harré, 1990), which frames social discourse as not simply communication, but also as an interpretive lens for making sense of activity and locating individuals as kinds of people in relation to socially constructed storylines. For example, in classrooms, the teacher is positioned as a knowledgeable expert and manager of children's behavior. Children are positioned as learners, with a duty to obey the teacher. These positions are both constructed and revealed through interaction, creating relationships of power that shape the possibilities for activity. As such, positioning theory frames the interactional nature of activity as enabled and constrained by the normative possibilities of the authority, duties, and obligations associated with the different characters within the storylines at play (Davies & Harré, 1990). Children navigate lived worlds organized by storylines that afford particular relations of power. Within these storylines, particular roles or

characters take on more or less authority. For example, a child who threatens to “tell the teacher” about the perceived misdeeds of their peer in an effort to influence the peer’s behavior is drawing on the authority of the teacher to punish, whereas a child who tries to influence their peer’s behavior by insisting that they have greater knowledge or skills is drawing on their own authority in the form of competence. The deployment of different forms of authority shape possibilities for engagement, which we explore here.

In particular, this study explores the sources of authority children draw on in times of struggle during collaborative activity, and their implications for peer collaborative dynamics. Further, we explore whether there are grade-level differences in children’s deployment of authority during collaborative activity.

Methods

Study context and data sources

This study is situated within a broader Research-Practice Partnership between a university research team and an instructional team of five teachers at an elementary school in Northern California that served predominantly bilingual Latinx and Pacific Islander communities. The goal of the broader teacher-initiated partnership was to support teachers in implementing student-led collaborative mathematical activity, using the Contexts for Learning Mathematics (CFL) instructional units (Fosnot, 2007) as a curricular resource (see Table 1). The teachers involved in the study worked to create classroom contexts in which children were expected to author and evaluate mathematical ideas and to share this authority with one another productively and inclusively.

Table 1
Data sources and classroom context by grade level

Teacher	Grade	Unit	Number of Videos
Ms. Bene	Kindergarten	Bunk Beds and Apple Boxes	7
Ms. Kim	1st	Bunk Beds and Apple Boxes	7
Mrs. De Waal	2nd	Double Decker Bus	6

Data sources and analysis

Here, we report preliminary findings from an ongoing study focused on 20 total videos of student-led table work across three K-2 classrooms (see Table 1). The classrooms were selected in order to represent the early elementary grades, as the focus of this study. The research team (authors) created analytic content logs of each video at the 5-minute level, focused

in particular on describing children's talk, bodily orientation and gaze, and distribution of resources. Each video was content logged by two researchers and reviewed by the entire research team in iterative rounds of discussion and in the development of the content logs. We then selected moments of peer resistance, in which "multiple [interactional] bids to manage participation, author ideas, offer help, or lead the work are rejected by peers such that there is no settled authority" (Langer-Osuna et al., 2020, p. 338). We found 167 instances ($K = 83$; $1 = 33$; $2 = 51$), which we coded for both the type of struggle – e.g. for resources, attention, or a turn – as well as the sources of authority drawn upon. For example, an instance where a child threatened to tell the teacher or other adult on a student was coded as "drawing on adult authority." Codes were developed through iterative rounds of open coding until data saturation was reached. A finalized codebook comprehensively described the sources of authority used, including adult authority, children drawing on their own and one another's competence, the norms and expectations of the classroom, the norms or expectations of society, such as "girls won't like you if you do that," and more. We identified and examined patterns across the K-2 classrooms based on the three most common sources of authority, which we report below. Finally, we chose three instances to explore qualitatively in greater depth through interaction analysis representing each grade and each of the three most common sources of authority. Vignette analysis illuminated how the deployment of different sources of authority shaped peer collaborative dynamics.

Findings

The most frequent sources of authority deployed by children per classroom are indicated in Table 2. For the kindergarten and second-grade classrooms, adult sources of authority, such as the threat of "telling," was most frequently deployed during instances of struggle. In first grade, child/peer sources of authority, such as self-competence, were most frequently deployed. For all three classrooms, classroom norms and expectations was the second most frequent source of authority deployed. While there were differences across classrooms, they did not correspond to grade levels in a way that indicated developmental differences, but rather, differences in classroom cultures for interaction. We define these codes in Table 3.

Table 2
Top two most frequently deployed sources of authority per classroom

K	1	2
Adult Authority	Student Authority	Adult Authority
59%	47%	54%
Classroom Norms and Expectations	Classroom Norms and Expectations	Classroom Norms and Expectations
38%	47%	38%

Table 3
Definitions

Sources of Authority	Definition	Example
Adult Authority	Students explicitly invoke the teacher’s or other adult’s power (as embodied in the teacher person) in an effort to change peer behaviors	[raises hand] to get teacher’s attention “I’m going to tell the teacher” “She can see you” “Teacher’s coming to check you out”
Student Authority	Students invoke assumed strengths, knowledge, skills, or competence in themselves or in their peers in order to change behaviors or resolve struggles	Copy her “Let her do it, she knows how to write” I know how to do this, guys
Classrooms Norms and Expectations	Students invoke the mathematical, socio-mathematical, and social rules or expectations of the classroom/activity in an effort to change peer behaviors	We’re supposed to do this together You’re not supposed to touch that Don’t count by ones


We then explored three instances wherein these sources of authority were deployed, and traced their consequences on the collaborative dynamics through vignette analysis. The kindergarten vignette highlights how children drew on adult authority (the classroom teacher, for example) in response to peer resistance in ways that ended the collaboration. The first-grade vignette shows how children at first drew on classroom norms and expectations to influence peers, then shifted into drawing on adult authority in ways that dissolved the collaboration. The second-grade vignette shows how children drew on classroom norms and expectations and peer competence in ways that maintained the collaboration.


Kindergarten: “I’m telling!” “You are telling on me?”

Table 4 offers a vignette of two children, Nicolas and Ashley, working together to represent combinations of the number eight, using a worksheet and a rekenrek (a kind of abacus). In the vignette, Ashley drew on the threat of teacher authority to position Nicolas as behaving inappropriately, while Nicolas protested that he had done nothing wrong. However, despite his protests, Nicolas relinquished task materials in response to Ashley’s wielding of teacher authority, folding his body increasingly into himself, spatially and verbally disconnecting from the collaboration entirely.

Table 4

Kindergarten Vignette Transcript: “I’m telling!” “You are telling on me?”

Line	Time	Talk	Action	Figure
1	34:40	N: Ok. One (.)	Nicolas is facing forward and has the rekenrek in front of him. He is counting beads. Ashley is sitting next to Nicolas and is facing forward drawing lines on the paper.	
2		N: There’s one on the top and,	Ashley is having a conversation with students sitting across from her about moving the microphone.	
3		N: Two, three, four, five, six, seven, eight.		
4		N: There are eight. A: There’s four.	Nicolas shifts his body towards Ashley. Ashley looks over the rekenrek.	
5		N: One, two, three, four. Ok.	Nicolas recounts the beads and Ashley begins to draw circles on the worksheet. Nicolas shifts the rekenrek towards the middle of the table.	
6		A: NICOLAS YOU’RE SUPPOSED TO DO IT!	Ashley turns to Nicolas. Nicolas turns to look at Ashley and taps the rekenrek on the table.	
7		A: I’m telling.	Ashley continues to draw circles on the worksheet.	

8		N: Wha::t, what I’m doing to you, I’m not doing nothing.	Nicolas continues to move the beads on the rekenrek.	
9		N: Ms. Bene.	Nicolas looks up at the teacher and continues to move the beads on the rekenrek.	
10		A: Ms. Bene.	Nicolas turns to look at Ashley.	
11		A: Ms. Bene.	Ashley raises her hand towards the teacher who is working with a student across from her.	
12		Ms. Bene: Hold on a second.		
13		N: What?	Nicolas places both hands on the table and interlocks his hands and turns towards Ashley.	
14		A: You touched this (.) XXX.	Ashley points at the microphone in the middle of the table.	
15	36:09	N: You’re gonna tell on me? Why?	Nicolas puts his head on his hands and looks down, away from Ashley.	


Nicolas represented a number on the rekenrek, which he slid over towards his partner Ashley as he counted the beads aloud (lines 1–5). Ashley responded in protest, asserting that Nicolas was supposed to be doing something else (line 6). Nicolas gestured surprise to Ashley’s utterance and tapped his rekenrek on the table (line 6), signaling that he was contributing appropriately (having represented a number on the rekenrek) and thereby resisting Ashley’s notion. Ashley then threatened to “tell” (line 7), a move that positioned Nicolas as having done something wrong and facing consequences if his wrongdoing was communicated to the teacher. In doing so, Ashley took on the power of teacher authority by proxy. Nicolas protested that he had done nothing wrong. Ashley then called on the teacher (lines 10–11), who acknowledged Ashley (line 12). Nicolas let go of the rekenrek completely, increasingly folded his arms and then his body into himself (see screenshot, line 15), and ceased his activity as he pleaded with Ashley (line 15).

First Grade: "Gonna find out who's naughty and nice."


Table 5 offers a vignette of two children, Erick and Angela, tasked with making "easy" representations (those anchored in 10) or "hard" representations of the same number on a rekenrek. Angela had been directing her partner Erick, unchallenged, from the start of the collaborative activity. Erick eventually began to challenge Angela's authority after a series of slights: she took his turn recording the bead combination on the worksheet, took the rekenrek from his hands to recount the beads on her own, and then critiqued his work. They engaged in a struggle at first in ways that drew on the task norms and expectations, in particular expectations around turn-taking; while they continued to be in some amount of conflict, they nevertheless sustained engagement. This changed when one of the partners, Angela, began to draw on adult sources of authority, and the interaction was dismantled.

Table 5

First-Grade Vignette Transcript: "Gonna Find Out Who's Naughty or Nice"

Line	Time	Talk	Action	Snapshots
1	27:02	A: Wait I'm supposed to write this one.	Angela makes 13 on the rekenrek, 10 on the top and 3 on the bottom.	
2		E: Okay.		
3		A: Okay we have to do this one and then I think then this one, remember?	Angela is drawing on the paper, Erick turns towards her watching.	
4		E: Nuh uh.		
5		A: Uh huh.		
6		E: I do the hard way.		
7		A: Yeah this is the easy way. Ten...okay now my hard way.		
8		E: My hard way.		
9		A: You do the hard way.		
10		A: What's this?	Erick is making 13 with 5 on top and 8 on the bottom. Angela touches the microphone on the table.	

11		O: That’s to record your voice.		
12		A: Is it?		
13		E: Hellooo.	Erick leans in to the microphone.	
14		A: Ask her.		
15		E: It’s the camera.		
16		A: What’s this?		
17		E: I’ll show you it’s the camera.	Erick drops out of his seat, crawling on the ground to show how the microphone wire connects to the camera, Angela continues talking to Olivia at the table.	
18		A: She says it’s to record your voice.		
19		O: No that’s the camera.	Olivia points to the camera.	
20		A: Oh. Maybe you could ask her, what is this?		
21		E: Counting now, counting! The bus is moving!	Erick comes back, and starts moving the rekenrek on the table like a bus.	
22		A: 5, 10, 11, 12, 13!		
23		A: 5 on the top and how many on the bottom?	Angela starts drawing on the paper.	
24		E: You wrote yours so I write mine. I didn’t get to write mines!	Angela keeps drawing.	
25		A: You’re doing this one, then I do this one.	A is pointing to the paper.	
26		A: Wait, how many?		
27		E: 8!		
28		A: 1, 2, 3, 4, 5, 6, 7, 8	Angela counts the 8 bottom beads on the rekenrek while Erick has it clasped in both hands.	
29		A: You did the opposite of me!	Angela keeps drawing.	
30		A: Never mind!		

31		E: No I didn't!		
32		A: Wait. Wait, wait, wait. Let me see.	Angela takes the rekenrek from Erick.	
33		E: look! 1 and 8.	Erick points to the paper.	
34		A: Wait. 1, 2, 3, 4, 5, 1, 2, 3, 4, 5, 6, 7, 8.	Angela counts beads on the rekenrek. Erick puts his head down on the table as Angela counts. Across the table, Olivia says to her partner, "now it's your turn" and she and her partner switch materials.	
35		E: You see Olivia's not doing it the same way you do it.	Erick pops back up, looking at the partnership across the table, using his pen to manipulate the microphone wire, which is taped to the table. Angela does not respond.	
36		A: Stop doing that, Erick!	Erick starts nudging his pen under the microphone wire.	
37		E: I was just like this.	Erick shows how he is sliding the pen under the wire without moving the microphone.	
38		A: Or else Imma tell. You can't do that. You're ripping off the tape.	Erick picks up his pen, closes the cap, then rests his head in his hands.	
39	29:49	A: (singing) "Gonna find out who's naughty or nice, Santa Claus is coming..."	Angela rests her head in her hand, looking at the paper in front of her.	

Erick's first challenge to Angela's directives (lines 4–9) involved a series of turns where Erick held his ground (lines 4, 6, 8). Angela then turned attention to the microphone, engaging Erick in conversation about it (lines 10–12). Angela tried to reclaim authority by issuing directives about the microphone (lines 14, 20), which were again unsuccessful. Erick re-engaged Angela with the task and asserted his right to contribute (line 24). Angela continued to issue unsuccessful directives or complaints (lines 25, 29, 36), then invoked the authority of the teacher, threatening to tell on Erick (line 38). She then further invoked the authority of Santa Claus, whose Christmas Eve visit was


only weeks away, by singing the lines, “Gonna find out who’s naughty and nice” (line 39). Erick acquiesced; he stopped his actions entirely, and lowered and shifted his body away from the partnership.

Second Grade: “We are never going to finish!” “Copy us, please!”


Table 6 offers a vignette of two partnerships working at the same table: Fale and Aaron, and Valeria and Gabriel. Each partnership was working to determine how many empty seats were on the top of a double decker bus using a worksheet and a rekenrek. The children were explicitly instructed to first write their name, their partner’s name, and the date on their worksheet. While Aaron quickly completed the instructions and began working on the problems with Fale, Gabriel sat staring at the worksheet until the teacher approached him and reminded him that there were three things that needed to be written at the top of the worksheet.

Table 6

Second-Grade Vignette Transcript: “Are You Kidding Me?!”

1	33:30	V: We’re never gonna finish it. He doesn’t even know what to do with (XXX)		
2		F: Copy us, copy us, please, I just, I don’t know: w I just feel bad for them.	Fale turns paper to face Valeria.	
3		F: So put two on there...	Fale points to a spot on the paper he is holding and Gabriel starts erasing something on his own paper.	
4		F: Wait, copy the date.	Fale puts his hand on Gabriel’s paper. Gabriel pulls it away and continues erasing. Fale points to a spot on his paper.	
5		F: Let Valeria write, she knows how to write.	Fale reaches to touch Gabriel’s paper and Gabriel pulls it from Fale and towards himself.	
6		G: I know how to write.	Gabriel looks at the board and continues to write on his paper.	

7		V: Don't write that (XXX) the date.		
8		F: Is is this right?	Fale points to something on his paper.	
9		A: ten slash twenty six		
10		V: You don't know how to do it?!	Gabriel holds the paper and turns towards Valeria.	
11		A: Look, it's ten(.		
12		[overlap] V: Are you kidding me?!		
13		[overlap] A: slash(...) two thousand		
14		F: The da:::te! The:: date.	Fale turns the paper he is holding towards Valeria and Gabriel and points repeatedly to it.	
15		F: One:: zero, put one(.)one(.)put a one!	Gabriel continues to write on his paper.	
16		V: Can I do it right now yet?		
17		F: Could you just do it?	Fale puts his hand on Gabriel's paper.	
18		F: one, zero		
19		[overlap] A: one, zero		
20		[overlap] F: one		
21		[overlap] A: zero		
22		[overlap] F: zero!		
23		A: slash		
24		[overlap] F: slash		
25		A and F: slash!		
26		(XXX): goodness		
27		A: twenty-six		
28		[overlap] V: twenty-six		
29		A: two six		
30		[overlap] V: two six		
31		G: two(...)six	Gabriel continues to write.	
32		V: six!		
33			Gabriel starts erasing.	
34		G: I don't get this, you guys are(.		

35		F: Just write your answer, put two and six right here, goodness.	Fale points to Gabriel’s paper. Gabriel pulls it away and continues to write.	
36		G: I know		
37		(XXX): Go::sh, twenty six		
38		F: one, two(...)one, two(...)two!	Fale turns his paper towards Gabriel.	
39		V: two		
40		V: goodness:::		
41		A: zero		
42		F: one five		
43		[overlap] A: one five		
44		F: Go::sh you got to understand this, Gabriell		
45		G: I just don’t(.)		
46		V: Ok, now two and six		
47	35:20	G: Look, I can copy it right there, I was copying it right there, remembering, but she said ‘no:: no::?’		

Fale, Aaron, and Valeria interacted with Gabriel in ways that created a sense of urgency to direct him towards quickly completing the opening instructions. While the teacher’s authority was not directly referenced, utterances by Gabriel’s peers (lines 1, 2, 10, 12, 14–32, 35, 44) such as, “We are never going to finish it” (line 1), “Copy us, copy us, please!” (line 2), “Are you kidding me?!” (line 12) marked a perceived need to rush and implied consequences to running out of time. Gabriel’s peers also positioned him as lacking competence that they themselves had. For example, Fale directed Gabriel to “copy us” (line 2) and to let Valeria write the date (line 5). Gabriel resisted both the group’s directives and their positioning, stating that he knew how to write (lines 6, 36, 47) and pulling the worksheet closer towards himself (lines 5, 35). Unlike in Vignettes 1 and 2, where the direct threat of adult authority overwhelmed resistance against directives, here, Gabriel was able to resist his peers’ directives and remained engaged in the task.

Discussion

The sources of authority that children draw on—that is, the stories about authority they use to influence one another or resist influence—can have implications for the ways in which they learn and work together. Drawing on the power of adult authority through the perceived threat of getting in trouble can overpower student resistance to a peer’s commands and shut down possibilities for shared work. When the threat of getting in trouble was less directly connected to the teacher, and the children positioned themselves and one another with intellectual authority, peer resistance was sustained and all the children remained engaged in the collaboration.

Classroom-level differences suggest that dynamics around authority are tied to instruction and are not necessarily developmental. In new analyses, we are examining the case of the first-grade classroom, in particular, in which the students most frequently drew on student authority and classroom norms and expectations. Bringing these preliminary results together with other studies from this broader project, we are finding that even young learners can learn to take on and share intellectual and social authority in productive and inclusive ways and that particular kinds of classrooms support these aims.

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