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Scaling and Scalar Analysis as a Framework for Research on Teacher Learning

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ABSTRACT

This paper argues for scalar analysis as a framework for understanding negotiations of competing ideological demands and power relationships in teacher learning. Two illustrative examples are presented, including video data of a student teacher (Camille) attempting to integrate multimodal and digital literacy practices into their instruction, and a research interview between Lara and Camille. Drawing on research in both literacy studies and applied linguistics, the illustrative scalar analyses move beyond linguistic understandings of discourse to also include embodied discourse and materiality as central to understanding complexities of teaching and teacher learning. Implications are presented for research and practice.

KEYWORDS

Sociolinguistic scales; scaling practices; teacher learning; teacher identity; positioning; student teaching

It is well established that new teachers' negotiations of multiple and oftentimes conflicting ideological commitments are coconstructed along with teachers' identity trajectories (e.g., Alsop, 2006; Beauchamp & Thomas, 2011; Britzman, 2003; Henry, 2016; Schieble et al., 2015). Research documenting such negotiations has primarily engaged discourse analytical tools, and indeed we build on such approaches and the insights they have provided regarding language and literacy ideologies and identities (Kroskrity, 2004; Lindahl et al., 2021). However, a linguistic lens alone does not attend to the full range of ideological and semiotic resources people draw on to negotiate power relationships (Stornaiuolo et al., 2017). In this paper, we illustrate how scalar analysis (Blommaert, 2015; Stornaiuolo & LeBlanc, 2016) can further researchers' analytical repertoires for understanding how teachers negotiate complex power relationships in practice, accounting for embodied and material positioning alongside linguistic discourse. We view scalar analysis as a powerful tool for nuanced understandings of how teachers and students are positioned and negotiate multiple political demands in their work.

We present illustrative examples from our research, focusing on one student teacher's (Camille; all names are pseudonyms) video recorded instruction

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and interview excerpts with Lara. Our analyses highlight discursive, embodied, and material scaling practices through which Camille and her students negotiated contested ideological terrains of both school and research contexts.

Two decades of research has illustrated the competing interests and ideologies that new teachers negotiate, highlighting how such negotiations relate to professional identity construction. This research spans a wide array of programs, contexts, and content areas. Within literacy studies (Hunt, 2018; Ives & Juzwik, 2015; Marsh, 2006; Watson, 2007), science education (Braaten, 2019), and mathematics (Ma & Singer-Gabella, 2011; Renga et al., 2020), for example, research has centered around new teachers' negotiation of standardized curricular expectations. In bilingual and second language teaching, research has centered on language ideologies and teacher identities (e.g., Handsfield, 2012; Handsfield & Crumpler, 2013; Morgan, 2004; Orzulak, 2013). Other research has examined new teachers' negotiations of gendered ideologies, such as the construct of motherhood (Griffith & Smith, 1987), language ideological dilemmas (Lindahl et al., 2021), raciolinguistic ideologies (Fallas-Escobar & Herrera, 2022), and racial discourses and histories (Varghese et al., 2019) as they relate to teacher identities. Many of the ideological tensions described in such work evoke the "two worlds pitfall" (Braaten, 2019; Feiman-Nemser & Buchmann, 1985) between teacher preparation programs and public school contexts – differently figured worlds (Ma & Singer-Gabella, 2011) or contact zones (Smagorinsky et al., 2008).

A common thread in the research is attention to technologies of power (Devos, 2010), particularly as manifested in curricular standardization, and how these intersect with power relationships between preservice and novice teachers and mentors or supervisors (e.g., Hunt, 2018; Orzulak, 2013). Importantly, this work challenges unitary, binary, and static understandings of identity. For instance, Yazan and Rudolph (2018) highlight false identity binaries such as native or non-native English speaking, and how such binaries uphold monolingual norms. In the same way, both Marsh (2002) and Jackson (2001) push back against singular notions of identity, exploring new teachers' multiple and dynamic identity positionings and identities as they navigated various contexts and power relationships, including teacher preparation programs. Similarly, Henry (2016) used complex dynamic systems theory to examine moments of identity shift across three different timescales within a teacher candidate's practicum, characterizing her identity transformations as unstable and multiple.

Particularly relevant to our arguments in this paper is Kayi-Aydar's (2015) narrative analysis of one teacher candidate's multiple positionalities across time and space relative to different language and teaching ideologies as she shifted her focus and identity from foreign language to English as a Second Language teacher. The author argues that "understanding how teachers construct and transform identities is possible only when past, present, and future

narratives are analyzed together” (2015, p.156), a point that echoes Devos (2010).

These studies illuminate how the multifaceted, unstable, and contextualized nature of new teachers’ negotiations of power relationships contribute to identity construction. However, this research base primarily examines these processes as discursive – constructed via linguistic interactions using methods such as narrative and discourse analysis. This is despite the fact that educational scholarship, including within applied linguistics, has long embraced a broad array of semiotic resources, including but also extending beyond language, in teaching and learning (Blommaert, 2005; Kress, 2003; Vygotsky, 1978; c.f.; Estola & Elbaz-Luwisch, 2003). However, research in teacher learning has seldom integrated this wider array of semiotic resources methodologically.

A scalar framework invites researchers to think beyond linguistic interactions to consider how embodied practices (gestures, body movements, and movements within classrooms) as well as materiality (e.g., interactive whiteboard, furniture arrangements, writing tools, etc.) function along with linguistic utterances during identity negotiations. However, we identified few studies using scalar analysis to understand prospective teachers’ identity negotiations (Crumpler & Handsfield, 2020; Pandya, 2012; Stewart et al., 2021).

Scales and scaling practices

Drawn from sociolinguistics, social geography, and world-systems theory (Collins, 2012), scales refer to power-laden structures and resources within and across social spaces that index different social orders and power relationships (Blommaert, 2007). The concept helps conceptualize negotiations of competing ideologies within complex social contexts.

Sociolinguistic scales

Rather than *timescales* (Lemke, 2002), ranging from a few seconds or minutes to weeks or even years, we focus on *sociolinguistic scales* – horizontally distributed and vertically ordered semiotic resources (e.g., discursive norms, materials, and ideologies) for constructing meaning and power relationships. Scales structure space-times that in turn come to matter (both physically and ideologically) in social practice (Collins, 2012).

Sociolinguistic scales resemble Bakhtin’s (1981) concept of chronotopes: durable but dynamic ideological constructions that guide social practices, producing material effects that in turn constrain or afford further social practices. However, chronotopes characterize the availability of discourses, while “scales account for the accessibility of such contextual discourses in interaction” (Stornaiuolo & LeBlanc, 2016, p. 267). This difference helps

scholars conceptualize how chronotopes are differently ordered with respect to power. “Lower” scales are fleeting or momentary and local or highly contextualized while “higher” scales are constructed as timeless and global or translocal (Blommaert, 2007). Behaviorist teaching, which centers didactic, direct, linear, and standardized practices, is highly scaled, while open-ended, dialogic, and student-centered teaching approaches are lower-scaled. Consider a preservice teacher facilitating a math lesson using an online video game familiar to her students. As students interact in small groups with video game content, they identify and apply mathematical constructs. Centering a popular culture text rather than a traditional academic text invites students to participate in imagined and open ended worlds and problem-solve collaboratively (Gee, 2007). This approach would be considered lower scaled – local, momentary, and highly contextualized within a specific sequence of instruction. Higher scaled practices, on the other hand, are considered more universally-applicable or standardized.

Scaling practices

Mobility is essential in considering issues of power within this framework. This implies *doing*, rather than static states of being. Just as researchers in applied linguistics emphasize languaging (Pennycook, 2012), rather than viewing language as an object decontextualized from interaction, Canagarajah and DeCosta (2016) suggest that researchers focus on the *doing* of scales, or scaling practices. Scaling resembles discursive positioning (Harré & VanLangenhove, 1999), but expands social interaction and identification to include a wider array of semiotic resources, including utterances, material objects, gestures, and body movements (Wortham & Rhodes, 2012) recruited in power-laden networks of activity (Stornaiuolo et al., 2017). It is through scaling practices that a chronotope “takes on flesh” or materializes (Bakhtin, 1981, p. 84).

Stornaiuolo and LeBlanc (2016) identify six scalar moves: upscaling and downscaling (in which people position themselves spatially and temporally in relation to others), and anchoring, aligning, and contesting (which describe practices of layering discursive, material, and embodied scalar dimensions). Blommaert (2007) offers an example of upscaling in a conversation between a doctoral advisor and student:

S: I’ll start my dissertation with a chapter reporting on my fieldwork

T: We start our dissertations with a literature review chapter here. (p. 6)

The advisor exerts power by making “physical space and time into controlled, regimented objects and instruments” (p. 5), including the discursive and material norms of the dissertation. The use of “we” and deictics like “here” constrict discursive and material norms, making them appear natural and

universal, and thus difficult to contest. However, people in less powerful positions also engage in scaling practices to contest normative frames, flattening dominant hierarchies. *Downscaling* moves, then, describe how people may invoke semiotic or ideological resources of a lower scale to reconfigure power relationships (Stornaiuolo & LeBlanc, 2016).

Anchoring moves are related to downscaling but do not involve shifts from higher to lower scales. “Rather, anchoring situates the writer or speaker in the present moment or space in order to assert the validity of local norms and practices” (Stornaiuolo & LeBlanc, 2016, p. 273). We have also noticed what we call *sedimenting* moves, which involve layering additional resources in an attempt to sediment or reinforce an immediately prior downscaling or upscaling move.

In contrast, aligning and contesting moves involve simultaneously invoking higher and lower-scaled resources, complicating scalar orderings. *Aligning* moves are similar to sedimenting moves in that they are often intended to strengthen a position through combining resources “with different scalar weight in new alignments ... to build or maintain affinity among a seemingly disparate group” (Stornaiuolo & LeBlanc, 2016, p. 273). *Contesting* moves (Stornaiuolo & LeBlanc, 2016) involve scale shifts intended to contrast scalar norms or to reveal inherent contradictions.

These scalar moves encompass the “nonlinear, unpredictable, layered, and multidirectional” (Canagarajah & DeCosta, 2016, p. 3) aspects of social practices. From this view, student teaching, episodes of teaching recorded for research purposes, debrief sessions between supervisors and teacher candidates, and other teaching and teacher learning events, can be viewed as assemblages of heterochronically and heterotopically layered chronotopes that come to cohere or decohere as discursive and material resources come into play through social activity (Supplementary figure, online content). Scalar moves are essential to this process, forming a glue that makes discursive and material resources cohere into recognizable chronotopes and identities, or a solvent that makes them appear to dissolve. Further, they can make social practices recognizable as multiple things simultaneously – monologic, cutting edge, standardized, etc.

Scaling has been used to examine globalization and mobile digital literacy practices (Stornaiuolo & LeBlanc, 2016), identities (Clonan-Roy et al., 2016), and educational policy (Mortimer, 2016). Within teacher education, Stewart et al. (2021) used scalar analysis to investigate how teacher candidate identities are constructed, contested, and rescaled with larger program and policy discourses, while Pandya (2012) argued that suppression of certain scales in policy documents shapes classroom decision making. Our analysis extends this scholarship by addressing how dominant ideologies and teacher identity frames may be both reinscribed and broken down in practice to create generative spaces in which new configurations of identities may be negotiated.

Methodology

Our examples are drawn from a two-year study investigating preservice and practicing teachers' discursive negotiations and positioning as they moved from methods coursework and professional development on digital and multi-modal literacies into instruction. Here we focus specifically on the question: How did Camille position herself during student teaching vis-à-vis multiple ideologies of literacy and teaching?

Research design

The study involved both preservice and practicing teachers and included three phases. During phase 1, four teacher educators, including Lara, redesigned and taught the first in a sequence of literacy courses with a focus on linguistic diversity and multimodality. Camille was one of Lara's students in this course. Also during phase 1, Lara and Tom facilitated a study group for practicing teachers on literacy for linguistically diverse students. Phase 2 occurred one year later and included a study group for 15 preservice and 15 inservice teachers around multimodality and literacy instruction. Camille and her work team focused on integrating popular culture texts into literacy instruction, a practice intended to challenge standardizing frames of teaching.

At the beginning of phase 3, participants generated "doable" instructional goals withing the material and political contexts of their teaching practice. Camille's goal echoed that of her work team: to integrate students' popular culture interests into literacy instruction. We conducted classroom observations, including two to three video recorded lessons of each participant as they worked toward their goals. We then debriefed with participants while watching one video recorded lesson.

Focal participants and context

Camille was a White, middle class, 36-year-old woman enrolled in her second bachelor's degree, with a previous career as an athletic trainer. Like Lara, she was a mother of two – a shared identity that Camille draws on in the interview excerpt. We focus on Camille for two reasons: First, she was the only participating preservice teacher whose cooperating teacher (CT) agreed to video recording in the classroom during student teaching. Second, Camille's student teaching context, in which teachers followed a standardized skills-based curriculum, contrasted with her goal of integrating popular culture texts into literacy instruction – a practice advocated within her teacher preparation program. In short, Camille was both a sample of convenience (Patton, 2014) and a "telling case" (Mitchell, 1984) for understanding preservice teachers' negotiations of competing ideologies of literacy teaching and learning and power relationships.

Camille attended, and both authors taught in, an elementary teacher preparation program at a large state university in the U.S. Two literacy courses were required – in fall and spring of teacher candidates’ third year. A three-week clinical followed the next fall, and student teaching occurred the subsequent spring. Camille student taught in a third-grade classroom including 26 students at a small rural elementary school with a predominantly White economically diverse student population, all of whom spoke English as their first language.

Broadly speaking, Camille’s teacher preparation clinical contexts can be characterized by contrasting ideologies and teacher identity frames. As these frames are brought to life in the research context (Camille’s instruction and in our interviews) they can be viewed as assemblages of heterochronically and heterotopically layered chronotopes that take shape, become visible, and are sometimes dislodged in practice. Some of the chronotopes that were particularly salient include curricular ideologies and institutional identity frames, such as being an authoritative teacher, being a responsive teacher, standardization, and authentic teaching (Table 1), as well as being a mother, a teacher candidate who had a previous career, and a novice teacher.

Such frames are mobile and unsettled in practice: When they hit the ground in the classroom, they are not neat and clean implementations of sterile policies or principles. Similarly, what it means to be a novice or expert, or a student teacher who is also a mother of two, are far from static. Multiple identities or positionings are brought into play through various assemblages and or contexts of practice that are themselves unstable and shot through with power. Scalar analysis makes power visible.

Scalar analysis

Canagarajah and DeCosta (2016) suggest that researchers investigate *how* scaling practices occur, including the material, narrative, discursive, and ideological resources recruited for scaling practices. As such, scalar analysis should be detailed, critical, and multimodal. Several analytical tools can serve this purpose, including small story and positioning analysis (Bamberg and

Table 1. Examples of Higher- and Lower-Scaled Ideologies and Identities in the Research Context

Higher-Scaled (Camille’s clinical context)	Lower-Scaled (teacher preparation program)
Standardization <ul style="list-style-type: none"> ● standardized testing and test-preparation ● decontextualized skills instruction ● linear skills accumulation ● basal reading series and workbooks ● Individual seatwork Authoritative teacher identity <ul style="list-style-type: none"> ● teacher centered instruction ● pedagogy of transmission ● Initiation-Response-Evaluation/Feedback (Cazden, 2001) 	Authentic Teaching <ul style="list-style-type: none"> ● authentic assessments ● meaningful and contextualized instruction ● textual interpretation ● authentic and popular culture texts ● student collaboration Responsive teacher identity <ul style="list-style-type: none"> ● pedagogical experimentation ● reflection-in-the-moment ● dialogic interactions with students

Georgakopoulou 2008; Ives and Juzwik 2015). Because our focus was broader than narrative or small stories (brief narratives within everyday speech or discourse that indicate social positioning (Gubrium & Holstein, 1997), we drew on elements of microethnographic discourse analysis (Bloome et al., 2005), which we then adapted to include analyses of body movements and material artifacts (Crumpler & Handsfield, 2020; Handsfield et al., 2010; Handsfield & Crumpler, 2013). This approach has been useful for zooming into micro-level moments through which scaling practices become visible. While we began our analysis with recursive qualitative coding (Miles et al., 2014) to identify salient ideologies such as those presented in Table 1 and focal excerpts for further analysis, we focus here on our micro-level analyses.

Microethnographic discourse analysis (Bloome et al., 2005) focuses on discursive elements of classroom events to ascertain how dominant meanings and power relationships may be reproduced and/or reconfigured. We transcribed the audio and video recordings using conventions adapted from Green and Wallat (1981) (Appendix). This involved identifying speaker turns, semantic features of utterances, volume, and other contextualization cues (e.g., intonation, stress; Gumperz, 1982). Additional descriptions and video stills of gaze, gestures, and body movements relative to material objects (e.g. Camille turning toward the whiteboard), appear in the righthand column of the transcripts. Next, we used contextualization cues, changes in speakers' goals, topical shifts, changing participatory demands, and body movements to determine message units (the smallest meaning units in conversation) and interaction units (stretches of "conversationally tied message units" [Green & Wallat, 1981, p.200]), indicated by line breaks.

Although micro-level analyses typically focus on utterances and paralinguistic cues (e.g., gaze, gesture), we extend our analysis to conceptualize how body movements contribute to emergent stances, or positioning, and material-discursive entanglements (Barad, 2007). Accordingly, we included video stills and descriptions in the microethnographic transcripts to capture these body movements and how material objects also played into scaling practices. We then examined these transcripts to identify different scalar moves.

Scaling in the research relationship

Scaling practices are ways of negotiating power relationships, and as researchers, we were a part of these relationships in the social contexts of our project and participants' classrooms. Lara and Tom are both White middle-class university professors and former teachers. Lara was a bilingual elementary teacher, while Tom was a high school English teacher. Additionally, Lara and Camille shared a similar age and experiences of motherhood, which played into our data generation and scaling practices, particularly in the interview data.

Lara was the videographer and interviewer in both excerpts and was also Camille's former professor in her literacy methods course. Accordingly, we consider our own scaling practices as they contribute to the data assemblages to critically examine researcher roles in challenging and/or reinforcing power relationships.

Scaling practices in pedagogical and research contexts

Here we present our examples of scalar analyses: An excerpt from one of Camille's video recorded lessons during her student teaching and an excerpt from Lara's audio recorded interview with Camille. These two excerpts highlight scaling practices both in the midst of student teaching practice and in the context of research on teacher learning.





Teaching pronouns with video games

Camille's video recorded lessons during student teaching focused on pronouns, a topic determined by the district curriculum. In the lesson from which we draw our first excerpt, Camille invited her students to bring video game manuals from home and had them work in partners to find pronouns within sentences in the manuals and copy the sentences onto a worksheet. Camille tried to establish a game-like quality to these lessons, but this was overshadowed by the standardized curriculum and the school's teacher-directed instructional culture. Notably, her CT, who adhered tightly to the curriculum, remained in the room during Camille's student teaching. Further, Lara, Camille's former literacy methods instructor and study group cofacilitator, was present as the videographer, amplifying ideological tensions and unequal power relationships.

The classroom reflected an authoritative teacher space, which was shaped in part by the material resources and physical and organization of the classroom, with student desks facing to the side or toward the interactive whiteboard, and Camille's cooperating teacher's desk at the back of the room. Camille maintained an initiation-response-evaluation/feedback (Cazden, 2001) script, as she called volunteers to the interactive whiteboard to circle the correct pronouns in different sentences. By circulating and positioning herself alternately at the back and front of the room, Camille maintained authority over the other students who remained seated. Despite using video game manuals, Camille was constrained by the curriculum's emphasis on decontextualized grammar and ideologies of standardization and teacher-as-authority. As we note in our analyses, these limited the lower-scaled ideologies of new literacies and popular culture to brief moments in time.

In [Table 2](#), a student initiated one of these side conversations, inviting Camille to explore the elements of the game Mario Kart: "You know what's pretty cool↑" (line 248). His bid initiated a new interaction unit, temporarily downscaling the lesson into a chronotope of new literacies, materially semiotized by game features (things

Table 2. “You Know What’s Pretty cool?”

Line	Speaker-Hearer	Text	Additional Contextualization
Interaction Unit 1: Instructional Mission			
238	C→Students	Last one	<div>*enunciating each word*</div> 
239	C→Sandy	**Place fake item boxes where	
240	Sandy→C	your opponent won't expect	
241	C→Students	them**	
242		Sandy	
243		do you see a pronoun	
244		in that last sentence ↑	
245		your	
246		"Place fake item boxes where	
247		your opponents won't expect them"	
Interaction Unit 2: Sharing Information			
248	S→C	you know what's pretty cool ↑	<div>Camille turns, moves back toward interactive whiteboard/interactive; whiteboard centers Camille and pedagogical focus</div> 
249	C→S	what's that ↓	
250	S→C	when you place them	
251	C→S	those things that grow	
252	S→C	I always think that they're	
253	C→S	something else	
254		but when I hit them	
255		they always explode on me	
256		do they ↑	
257		the fake ones	
258		the fake ones ↑	<div>Turns back to student, line 266</div> 
259		I know	
260		you gotta be careful	
261		see I actually took the time to	
262		read my manual last night ↑	
263		and now I know all these things	
264		so I really bet	
265		I could be really good at this	
266		now	
267		now that I've taken the time to	
268		do it	
269		we're going to move on	
270			
271			
272			
273			
274			
275			
276			
Interaction Unit 1 Resumes: Instructional Mission			
277	C→Students	So here's what we're going to do ↓	

that grow and explode; lines 252–256). (Camille likely invited this divergence by framing the activity as “a mission” earlier in the lesson.) Camille responded by asking, “Do they↑.” The student’s emphasis on “fake” in his subsequent response served as a correction, repositioning Camille more as a learner or novice gamer, another scaling move anchored to the lower scaled interaction unit.

Interestingly, Camille hesitated before responding, taking up the student’s invitation almost as an afterthought. We think Lara’s presence may have prompted

her to respond in more detail in order to animate a responsive teacher identity, highlighting complexities of scaling practices during student teaching, particularly while being observed. She began turning back to interactive whiteboard, a material anchor to the chronotope of standardization, but then turned back to the student (lines 267–268) stating, “I know, you gotta be careful . . .”

Camille then tells a “small story” (Bamberg & Georgakopoulou, 2008: “See I actually took the time to read my manual last night↑/and now I know all these things/so I bet I could be really good at this now/now that I’ve taken the time to do it” (lines 269–273). This constitutes an aligning move in that Camille integrates resources of varying “scalar weight” (Stornaiuolo & LeBlanc, 2016, p. 273) – taking a learner stance (assuming the voice of a student who does her homework) while simultaneously asserting an expert position as one who models appropriate behavior and ideologies of individual effort. This appears to be an attempt to maintain rapport or a responsive teacher positioning while simultaneously asserting teacher authority. In an upscaling move, Camille then moves toward the interactive whiteboard, announcing, “We’re going to move on” (line 276), ending the interaction unit, diffusing the sense of adventure and danger. This illustrates a literal embodied shift toward a safer, more dominant position away from student-focused practice within a moment of embodied interaction. Her aligning and upscaling moves were likely in response to the buzz of student activity, combined with her CT’s presence, with the goal of reassuming an authoritative teacher position.

These moves realigned the lesson with a chronotope of standardization, with its assumed temporal/historical decontextualization, or timelessness. This upscaling maintains the center of power of the chronotope of standardization: Space-time is “invizibilized,” further disciplining the discursive and material conditions of the lesson. We interpret these upscaling moves as producing a generative gap that allows Camille to put on the “mask” of teacher directed instruction for her CT while still engaging with popular culture texts.

Rescaling in the research interview

Our second data excerpt is from a conversational interview in which Lara and Camille watched and debriefed the lesson, discussing tensions between the skills-based curriculum and Camille’s goal of connecting to students’ popular culture interests. Importantly, the discursive, material, and embodied assemblage of the interview was quite different from the classroom. Lara and Camille met at a coffee house after she completed her student teaching. This neutral location was physically detached from both Camille’s student teaching context and the university. The absence of her CT, combined with the timing and the physical space, likely shifted power relationships compared to the video excerpt.

Nevertheless, Lara was still Camille's former professor and the researcher. Accordingly, ideologies of popular culture literacies, tapping into student interests, and teacher-as-facilitator, in the local space of the interview, carried more scalar weight. For example, early in the interview, Camille communicated the tedium of the skills-based approach, critiquing her CT's curricular choices as "a lot mo+re ||||| it was a lot more cut and dried than I had thought it would be." Her critique of her CT (institutionally recognized as more expert) downscaled the interaction to the lower-scaled chronotope of new literacies aligned with Lara's ideological commitments. Nevertheless, this same interaction involved upscaling to established university-based power relationships, with Camille as novice and Lara as expert. This is evidenced by Camille's tentative discourse throughout the interview, indexed by the addition of "I think" and a rising pitch at the end of several message units. Additionally, her lengthy pauses suggest careful word selection and her awareness of unequal power relationships. This makes Camille's rescaling move in [Table 3](#) all the more significant.

Several minutes into the interview, Lara asked Camille how her students' parents might view her use of video games (lines 001–002). This may have positioned Camille as a novice having to justify her pedagogical decisions, and her lengthy pause (line 4), word choices ("I guess," "necessarily") and emphasis on "bad" (line 019) suggest uncertainty regarding whether parents would approve. Her tentativeness may also stem from the recognition that her use of video game manuals did not alleviate the isolated skills focus of the lesson. However, in line 035, Camille abruptly initiated a new interaction unit in which she narrated a successful teaching event in science in which she did not have to negotiate the same ideological tensions, stressing the words, "me," "home," "environment," and "mark" successively. This downscaling move toward a more locally valued chronotope of meaningful rather than standardized and decontextualized instruction simultaneously repositions Camille as an expert who is comfortable making mistakes, crafts meaningful student engagements (lines 45–60), and who "made a mark" (line 78) on her students.

Importantly, Camille felt most confident when teaching science, perhaps due to her previous career. Shifting the interaction to a broader timescale (Lemke, 2002), back weeks and even years into her previous career, when she made contextualized professional decisions, was not an isolated episode of such rescaling for Camille. She engaged in similar rescaling in other interviews, differentiating herself from her younger teacher candidate peers and repositioning herself as similar in age, parenthood, and professional accomplishment to Lara.

Discussion and implications for research and practice

We have illustrated how scaling practices and scalar analysis can inform teachers candidates' (as well as students' and researchers') negotiations of multiple and often competing ideologies of literacy and teaching. Such scalar

Table 3. “I Made a mark.”

Line	Speaker	Message Units	Additional Contextualization
001	Lara	what sort of things	
002		do you think the kids-	
003		after this lesson	
004		went home and told their parents	
005	Camille		
006	Lara	I mean like	
007		if one of them went home and said	
008		{hey dad guess what we did today}	
009		what do you think	
010		about the rest of that sentence ↓	
011	Camille	probably	Chuckles
012		they would sa+y	
013		we read video game manuals	
014	Lara	uh hum	Lara laughing
015	Camille	I mean	
016		as far as saying anything about pronouns and	
017		contractions	
018		or any like that	
		I doubt that would even come out	
019	Lara	yeah yeah	
020	Camille	I guess that's not necessarily a bad thing	
021	Lara	what do you think the parents	
022		if that conversation were to continue	
023		what do you think the parents-	
024	Camille	-I think the parents	
025		would probably have questions	
026		about well{what subjects were you working o+n ↑ }	
027	Lara	uh hum	
028	Camille	you know	
029		{why are you reading video game manua+ls ↑ }	
030		things like that	
031	Lara	yeah	Lara laughing
032	Camille	my teacher made a Photo Works book for me	“teacher” refers to cooperating teacher
033		where she took different pictures	
034		from around the year	
035		and had the book bound	
036		and the kids wrote different letters for me in there	
037		one thing that sticks out to them	
038		is they um	
039		I mean it was XXX	
040		it was the science experiment that we did	
041	Lara	oh okay	
042	Camille	and it was talking about air pressu+re	
043		and the first time I did it	
044		we had a little malfunction	
045		and so it was when you fill glass up with water ↑	
046		and you put a piece of cardboard on the top	
047		flip it over	
048	Lara	right	
049	Camille	and the cardboard stays ↓	Laughing
050		he first time I did it	
051		the cardboard fell off	
052		and water went everywhere	
053	Lara	sure	Laughing
054	Camille	and so it's funny	
055		because that was one thing	
056		I think will stick with those kids	
057		when I spilled water over the floor	
058		so	
059		but in that-	
060		in some respects	
061		I had kids come back in the next day	
062		I mean this probably happened with one kid	
063		saying {I tried that at home}	

(Continued)

Table 3. (Continued).

Line	Speaker	Message Units	Additional Contextualization
064	Lara	oh uh huh	
065	Camille	whe+re-	
066		and I guess that is the thing for me	
067		you know	
068		they are going home and trying things at home	
069	Lara	yeah	
070	Camille	and just you know ↓	
071		if kids are taking something	
072		out of the classroom environment	
073		into their regular regular life	
074		then that is kind of where I	
075		made a mark	
076		I guess	

analyses help illuminate how hierarchies of power operate within and construct dynamic and mobile assemblages of practice. Camille and we as researchers participated in a variety of scalar moves across chronotopes to reshape and attempt to solidify these assemblages. This included shifting the interactions and power relationships out of the immediate space and time of the interview to draw on a wider range of semiotic resources and ideologies.

Mobility is central to scalar analyses. While Bakhtin’s concept of chronotope helps us understand the availability of semiotic resources at play within assemblages of practice, scalar analysis focuses the analytical lens on the accessibility of those resources in practice (Stornaiuolo & LeBlanc, 2016). Upscaling sediments chronotopic hierarchies that privilege dominant ideologies of literacy and teaching, while downscaling and other practices may flatten out dominant hierarchies, even if temporarily. As such, assemblages are far from stable or fixed. Our scalar analyses also draw the analytical lens away from a sole focus on linguistic discourse. Further, material objects are not inert; rather, they act on and are recruited in scaling practices. This includes instructional tools like the interactive whiteboard that operated on Camille and her students, often re-anchoring the activity to a chronotope of standardization.

Additionally, the assemblages of the classroom spaces and the interview space were quite different, with different embodied, discursive, and material resources intra-acting to form and reform various scaled assemblages. Camille’s classroom context, with video recorder running, students, researcher, and Camille’s CT present, and ongoing pedagogical activities are arguably more complex than the interview context. So it’s not surprising that Camille’s downscaling and rescaling practices were more frequent and robust during the interview. In fact, in her video recorded lessons, downscaling instances were fleeting and momentary. This highlights significant differences between contexts, including assemblages of practice within university teacher education classrooms and candidates’ clinical contexts.

Teacher learning is not a linear trajectory toward stable chronotopes or identity frames (Blommaert, 2015). It is a mobile process involving discursive, embodied, and material positioning across varied space-times, which themselves may fade or come into relief as they are scaled and rescaled in practice. Importantly, scaling practices do not serve only progressive or counter-hegemonic ideological commitments. Indeed, we illustrated how Camille and her students engaged in scaling practices that both challenged and reinscribed standardizing ideologies.

These analyses draw attention to the multiple semiotic resources new teachers may draw on to negotiate power relationships and multiple ideologies in classroom and school contexts. Teacher educators may support teacher candidates in identifying and leveraging the discursive and embodied capital they bring into their preparation programs to negotiate power relationships in clinical contexts. This may be developed through close analysis of their own discourse (Christ et al., 2012) and practices, and process drama engagements that involve opportunities for reimagining and reenacting scaling opportunities in pedagogical moments (Crumpler & Handsfield, 2020; Crumpler et al., 2011). Such practices may generate “spaces of new potentialities” (Reeves, 2018, p. 106) for teacher learning. However, such practices must involve critical and explicit discussion regarding how material, discursive, and embodied resources come into play in practice.

Further research should examine how space-times, identities, and power relationships are materially and discursively produced, negotiated, and reproduced in practice. Given the limited scope of our study, we recommend further scalar analyses to understand how power relationships are negotiated across contexts of university teacher preparation, clinical experiences, as well as professional development contexts and practicing teachers’ instruction. Such analyses should attend not only to language, but also embodied discourse and materiality.

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Appendix

Transcript conventions

	= one second pause
vowel +	= elongated vowel (So++, We+ll)
word	= boundaries of a style or voice change
-	= stops abruptly or speaker is cut off
text	= stress
text ...	= trails off (not cut off, or abrupt
text	= loudly spoken or shout
↑	= rise in pitch
↓	= drop in pitch
{text}	= double-voicing ¹
"text"	= speaker quoting another
Text	= reading text aloud
XXX	= unintelligible speech
[text]	= overlapping speech
US	= unidentified stude

¹Double-voicing: using "someone else's discourse for his own purposes, by inserting a new semantic intention into a discourse which already has, and which retains, an intention of its own" (Bakhtin, 1984, p. 189).