

THE STATUS OF COMPLEX INSTRUCTION: MAKING UP STUDENTS

By

Brent Eugene Jackson

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ABSTRACT

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Complex Instruction (Cohen & Lotan, 2014) is a groupwork pedagogy aimed at making classrooms equitable. The notion of status is at the core of this pedagogy and guides how teachers ought to respond to inequitable groupwork. In this dissertation study, I consider how the concept of status (from Expectation States Theory) is applied within mathematics education. In doing so I consider how status is used in the mathematics education research and teacher-practitioner literature, as well as how prospective secondary mathematics teachers' used the notion of status to make sense of small groupwork in their student teaching placements. This study was guided by the following research questions: (a) *How has status become an object that explains groupwork processes?* and (b) *How do prospective teachers use status to make sense of groupwork?*

To answer these questions, I developed a theoretical framework that explains how *kinds* of people are made up. Hacking's (1986) notion of *human kinds* plays a central role to understand the social construction of *low status* and *high status* students. I also draw on Foucault's (1980) notion of power/knowledge discourses to explain how systems of thinking, such as Complex Instruction, can be legitimized by institutions such as teacher preparation; and how scientific discourses contribute to the recognition of certain *kinds* of individuals. These ideas are complemented with Goffman's (1967) notion of interaction rituals to explain how being recognized as a certain *kind* influences individuals' interactions in certain settings.

I generated data from a methods course for secondary mathematics teachers. As a course assignment, the prospective teachers implemented aspects of Complex Instruction in their student teaching placement and then participated in reflective conversations with their student-teaching peers. I analyzed the framing (Goffman, 1974) of the stories that were told by the prospective teachers. The analysis revealed that Complex Instruction acted as an authoritative discourse which created a system of reasoning where status was recognized as a way of being (rather than as a function of the group members' interactions). More specifically, I demonstrate how the notion of the notion of status was coordinated with students' characteristics and mathematically histories to explain students' interactions.

Overall, I argue that the discourses of Complex Instruction may undermine its own equity-oriented goals. I discuss the implications of thinking about *low status* and *high status kinds* of students in which students are once again ranked among social and mathematical dimensions. I discuss implications for mathematics teacher educators when teaching about Complex Instruction.

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To Beckham – May you continue to be one of a kind.

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INTRODUCTION

In this dissertation study, I explore the construct of status within the increasingly popular pedagogy Complex Instruction (CI) (Cohen & Lotan, 2014). CI is a particular type of groupwork clearly oriented toward making classroom equitable spaces for learning. I was introduced to CI when I taught middle school mathematics. Many of the components of CI resonated with aspects of my teaching. For instance, CI requires the use of rich mathematical tasks that get at big, enduring mathematical ideas which aligned with my attempts at using high cognitive demand tasks. CI requires that students share, debate, and discuss their ideas; creating opportunities such as these were important, particularly for my students that were classified as English language learners. CI has clear structures that would help me to implement groupwork such as the use of student roles (i.e., facilitator, timekeeper, materials manager, reporter). I implemented these things; yet, groupwork was still uneven. I had “implemented CI,” but because I didn’t have a complete understanding of the role of *status* within group organizing processes, I didn’t understand why the groupwork was not operating in the ways I had hoped.

This qualitative study is about prospective teachers’ sense making with regard to status as they were learning to implement CI. Indeed, status is the linchpin in CI; without attending to status one is not really doing CI, but rather some form of groupwork. Status, as defined by Cohen and Lotan (2014) is “an agreed-upon social ranking where everyone feels it is better to have a high rank within the status order than a low rank” (p. 28). The construct of status helps to explain why and how some students become more influential than their peers (this is further explained in the Theoretical Framework chapter). Leading to this dissertation study, I continued to learn more about CI. As I worked with prospective and practicing teachers, I noticed the way ideas from CI were treated prescriptively. For instance, teachers wanted assurances that tasks they designed

were in fact *groupworthy tasks*, or not (Lotan, 2003). “It depends—how have you supported students to learn to work together in groups?” was an unwelcomed response. Groupworthiness as an intra-action among tasks, students, and students’ previous experiences seemed to be less comfortable than clearly defined categorizations. In my work with prospective teachers, I heard distinctions being made about social status and mathematical status. I remember asking myself, how do these different types of status come together to *matter* at once during small groupwork? At the same time, I was having conversations with a network of lesson study practitioners where “agency, authority, and identity” (Schoenfeld, 2018, p. 494) was a theme across the lesson studies. In these conversations, I was struck by the multitude of statements about some students not having agency and the desire to give students agency. I started to wonder, to what extent discussions about *status* were about having and giving students status. These events led to my close inquiry into the *status* of CI. The status of CI has two meanings. In the first sense, CI seemed to be in a privileged state among mathematics education researchers; in this sense, CI had high status. In the second sense, what *is* status and where did the notion come from? This is where this dissertation study begins.

To build my understanding of status and CI, I investigated prospective secondary mathematics teachers’ storytelling of groupwork. The participants in this study were enrolled in sequence of mathematics teaching methods courses which studied CI in numerous ways. As the instructor of the course, I enthusiastically (or with messianic zeal) sung the praises of CI. In singing these praises I was doing my own storytelling, my own worlding. Storytelling is interesting to me because stories (or narratives or myths) are the way we construct and make sense of our experiences and they build our reality. We build stories about our lives generally and we build stories about our classrooms. In this study, I analyzed the prospective teachers’

stories about CI groupwork from their students teaching field placements. In my analysis I pay particular attention to the characters of those stories. So, what is the story that “Mathematics Education” tends to tell about groupwork and CI?

The use of groupwork in mathematics classrooms has been advocated for over the past two decades. Groupwork supports student learning of mathematics, in part, because of the potential to provide students with opportunities to engage in higher order thinking (Johnson & Johnson, 1999). This aligns with expectations of the Common Core State Standards for Mathematics (CCSS-M) practice standards and the National Council of Teachers of Mathematics *Principles and Standards for School Mathematics* (NCTM, 1998). Students are expected to share their thinking, construct explanations, and use evidence to justify those explanations. These standards set the expectation that students *do mathematics* (Stein et al., 2000) by engaging in tasks that require students to reason, develop conceptual understanding, and make connections among mathematical ideas, versus tasks which focus on the development of skills and procedures. The continued attention in recent years to the use of groupwork is partially because of the affordances it can have toward these types of mathematical practices and processes, while groupwork may also contribute to students’ prosocial development (Boaler, 2006; Johnson et al., 2010; Vakil & McKinney de Royston, 2019) and equitable learning outcomes (Na’ilah Suad Nasir et al., 2014).

Groupwork is not always smooth and the implementation of groupwork can be fraught with issues. Not all students have the same opportunities to learn while in small groups (Gee, 2008). Students’ opportunities to learn during groupwork are influenced by their peers’ perception of each group member’s abilities to contribute to the success of the group (Cohen & Lotan, 1995) along with other social factors such as friendship groups (Esmonde et al., 2009;

Takeuchi, 2016) and students' assessment of the social risk (Horn, 2017; Middleton et al., 2017). Peers' perceptions of another student's ability are constructed through a combination of factors, which may include prior academic success, race, language, gender, and other social identities (Esmonde, 2009; Esmonde et al., 2009; Langer-Osuna, 2011, 2017; LópezLeiva & Khisty, 2014; Wood, 2013). As groupwork is carried out, students' perceptions of their peers influence how the group operates and who gets to contribute in what ways; at the same time, these interactions influence the development of some students being recognized as more mathematically capable than others. As such, students have different opportunities for learning within the group. CI (Cohen & Lotan, 2014) theorizes that the difference in students' opportunities for learning are derived from the formation of status hierarchies. CI as a groupwork pedagogy is explicitly aimed to ameliorate the formation of status hierarchies that result in inequitable opportunities for learning. The skillful implementation of CI has the potential to create equitable mathematics classrooms (Boaler & Staples, 2008; Featherstone et al., 2011; Horn, 2012; Na'ilah Suad Nasir et al., 2014).

Research Questions

To guide this dissertation study, I pose the following research questions:

- (1) How has status become an object that explains groupwork processes?
- (2) How do prospective teachers use status to make sense of groupwork?

Overview of Chapters

I begin the following chapters with a thorough overview of the literature about CI. In the literature I highlight key aspects of CI and relate those aspects to the notion of status. It is my intent to make clear how the notion of status is the linchpin of CI. Later in the literature review, I synthesize the empirical studies that demonstrated the potential for CI to aid in the creation of

equitable learning environments. Within these empirical studies I examine the use of sociometric surveys, which are one way that status was operationalized in earlier studies concerning CI. In the last portion of the literature review I discuss why learning to implement CI is difficult. Some of these reasons include the non-routine aspects of the pedagogy. In particular, the ability to see status in the moment and be able to respond to it in productive ways. The literature documents that learning to implement CI is difficult, precisely because the notion of status requires new ways of thinking about classrooms and students, many which run counter to the dominant notions of mathematics teaching and learning.

I then present the theoretical framework which guides this study. The theoretical framework begins with a presentation of the origins of status, from Expectation States Theory, a program of research from sociology. With this grounding, I present the theory of “Making Up Students.” From one direction, this framework explains how power/knowledge discourses (Foucault, 1972) from institutions such as sociology work to create *kinds* (Hacking, 1986, 2007) of students. From another direction, this framework explains how everyday interactions, such as storytelling, draw on *kinds* to make stories (and oneself) comprehensible to others; for this work I draw on Goffman’s (1967) notions of interaction rituals.

Following the theoretical framework, I discuss the methods for this study. I explain the methodological rationale for Critical Narrative Analysis (Souto-Manning, 2006, 2014) and how CNA can help us to understand how CI and status may operate as powerful narratives within mathematics education. In this section, I also present the details of the assignment that prompted the prospective teachers to tell stories of groupwork. I also fully describe my methods of analysis, how and why I paid particular attention to the “characters” of the prospective teachers’ stories.

Next, I present two major findings chapters. The first chapter reveals how status was related to students' characteristics. The second chapter reveals how status was related to students' mathematical histories. Overall, I highlight how CI, status, and the stories created *kinds* of students.

In the concluding chapter, I delve further examine the *kinds* of students that were created in the prospective teachers' stories. In doing so, I draw on the two findings chapters to bring into sharp relief two kinds of students: the low status student and the high status student. I discuss these kinds of students and the ways they are related to the power/knowledge discourses of CI. Throughout this chapter, I suggest that in creating *kinds* of students, the ultimate goals of CI may be undermined. I suggest a performative lens to think about *status* that removes *status* as an individual trait and highlights status as an attribute of the group. I discuss implications for teacher education.

Lastly, I present my personal reflections on this project.

LITERATURE REVIEW

This study is about the notion of *status* and how it is used within the mathematics education community. I focus on how prospective secondary mathematics teachers used the notion of status to make sense of groupwork. *Status* is the linchpin in teachers' work with CI. In this literature review, I will first provide an overview of CI and its components. I will start here to demonstrate why and how status is the linchpin concept. Next, I will synthesize the studies that show the benefits of responding to status in the ways prescribed by CI texts. After having provided an overview of CI and how it "works," I will review the literature related to teachers' learning to implement CI. In short, CI as a guiding pedagogy is attainable for preservice teachers and practicing teachers; however, the literature also reveals that it is considerably difficult to think and respond in the spirit of CI since it runs counter to dominant ideologies about mathematics teaching and learning.

An Overview of CI

CI is a set of pedagogical tools aimed to help teachers equalize status in groupwork so that marginalized students have more equitable opportunities for learning (Cohen & Lotan, 2014; Featherstone et al., 2011; Horn, 2012). Status, as defined by Cohen and Lotan (2014), is "an agreed-upon social ranking where everyone feels it is better to have a high rank within the status order than a low rank" (p. 28). Status mediates how students engage with mathematics tasks, how students interact with one another, and how students interact with one another in mathematical contexts.

Proponents of CI explain the development of status hierarchies in groupwork from the sociological tradition of Expectation States Theory (Kalkhoff et al., 2020). I more fully describe Expectation States Theory in the theoretical framework. For now, I provide only a brief

overview. Expectation States Theory explains that *status characteristics* are used as a basis to form expectations of group members' competence and ability to contribute to collective task (Cohen, 1984). Status characteristics can be diffuse (i.e., race and gender) or specific (i.e., mathematics ability). Diffuse status characteristics are associated with presumed competence to those from dominant groups (e.g., White people, men). Sociologists have documented individuals working in a group unconsciously reference diffuse status characteristics to form expectations for other's ability to contribute to the group (Berger & Webster, 2018; Bianchi & Shelly, 2020; Chizhik et al., 2003; Corra, 2020; Correll & Ridgeway, 2006; Kalkhoff & Thye, 2006). In mathematics classrooms, expectations—derived from status characteristics—position students from dominant groups (diffuse status characteristic), as well as those students with prior mathematics success (specific status characteristic), as more competent. Students positioned as competent more frequently contribute solutions, contribute suggestions, and are deferred to as a mathematically authority. It is important to keep in mind that both diffuse and specific status characteristics are brought to bear in the formation of expectations. As such, both influence the development of status hierarchies.

Expectations Treatments

To ameliorate the formation of status hierarchies, the CI model proposes two methods called *expectations treatments* (Cohen & Lotan, 2014; Featherstone et al., 2011; Horn, 2012). The purpose of *expectations treatments* is to disrupt the established expectations of competence informed by status characteristics. The first method, a *multiple abilities treatment* directly provides alternative notions of (mathematical) smartness by describing to students the repertoire of skills (i.e., drawing diagrams, asking questions) necessary for groups to be successful. This strategy explicitly deemphasizes skills historically valued in school mathematics and provides

additional means for other students to be seen and to act in mathematically competent ways. The second method, *assignment of competence*, is a strategy to publicly give credit to a student for exhibiting a mathematical competency. To assign competence the teacher notices a specific mathematical strength or contribution and publicly describes to the group how the group's success was, in part, due to that contribution. To influence the group's interactions, competence ought to be assigned to students that the teacher has noticed are less influential or are afforded little space or airtime to make contributions to the group. Cohen and Lotan (2014) call this "assigning competence to low-status students" (p. 156). A problematic statement that I return to in the conclusion. Cohen and Lotan put it this way:

Status treatments such as [assigning competence] take advantage of the power of the teacher as an evaluator. Students tend to believe and value evaluations teachers make of them. Thus, if the teacher evaluates a low-status student as being competent on a particular multiple ability, the student will tend to believe the evaluation [...] Assigning competence is a powerful intervention. It can do much to boost the participation of a low-status student (p. 157-8).

The specific mathematical strength that is identified in this method must be seen as intellectual by the group (e.g., "nice coloring on the poster" will not cut it). Assigning competence is not praise and is not for a single student. Assigning competence is a treatment for the whole group with the purpose of altering the group members' expectations for who can participate and contribute to the group's success in meaningful ways.

Groupworthy Tasks

Other key aspects of CI include the use of groupworthy tasks (Lotan, 2003) and student roles. The first principle of groupworthy tasks is that they are mathematically rich. They are designed to "support long-term understanding of the content" (Horn, 2012, p. 41). Groupworthy tasks are built around conceptual ideas; open-ended to provide different solution pathways;

ambiguous; and require interpretation and justification (Cohen & Lotan, 2014; Featherstone et al., 2011; Horn, 2012; Lotan, 2003). Routine tasks that focus on the use of procedures and practice of skills are not groupworthy tasks even though some students may benefit from working with peers on such tasks (Lotan, 2003). Elsewhere, groupworthy tasks have been described as open-ended and ill-structured (Cohen, 1994). Groupworthy tasks allow students to exercise conceptual agency. The second principle of a groupworthy tasks is interdependence. To foster interdependence the tasks must be designed for a group, require individual and group accountability, and have clear evaluation criteria (Cohen & Lotan, 2014; Featherstone et al., 2011; Horn, 2012; Johnson & Johnson, 1999; Lotan, 2003). The nature of groupworthy tasks also serve to disrupt students' notions of what it means to be mathematically competent. This works in tandem with the *multiple abilities treatment* as described above. Theoretically, the non-routine nature of the groupworthy task weakens students' expectations of who will be able to contribute to the group's success—enhancing the conditions for more equitable participation. Even though a group-interdependent task (i.e., groupworthy task) is a scope condition for the application of Expectation States Theory, Cohen (1984) documented the development of status hierarchies when the task was not groupworthy and students' interactions were fleeting in nature. Thus, status hierarchies may form with or without groupworthy tasks; however, groupworthy tasks create additional opportunities to diminish the formation of status hierarchies.

Group Roles

The last aspect of CI that I will briefly discuss is the use student roles. Common student roles include the facilitator, questioner, recorder, and resources manager. The use of student roles allows the teacher to delegate authority and the roles provide a structure for students to aid in the completion of the task at hand (Cohen & Lotan, 2014; Horn, 2012). Roles scaffold students'

participation and provide a way for students to interact with one another as part of their duty to fulfill a role. In this way, roles are a mechanism to create space for students to provide ideas and ask questions when otherwise they may not be invited by their peers to share ideas or ask questions. Often, the roles are rotated frequently between students. As such, the use of roles diminishes the formation of status hierarchies since the roles create expectations for students to participate in prescribed ways. Importantly, the use of roles may not necessarily serve the intended purpose. Sengupta-Irving and Vossoughi (2019) and Langer-Osuna (2011) have both documented cases in which girls were not able to participate using their assigned roles due to patriarchal norms. In one case, a student, Brianna, was positioned by her male-counterparts as too authoritarian by “being bossy” (Langer-Osuna, 2011, p. 212); however, the boys acting in similar ways were designated as smart and allowed to carry out the facilitator role.

In this section I have summarized the main components of CI. I provided a brief overview of Expectation States Theory and how the theory informs the components of CI. Overall, I highlighted how the concept of status is central to CI. I described how the major components (multiple abilities treatments, assignment of competence, groupworthy tasks, and roles) each relate to status and attempt to diminish the formation of status hierarchies. With an understanding of how CI “works,” I now turn to synthesize the empirical research that documents the effects of implementing CI.

Empirical Studies of CI

The use of CI has been attributed to more equitable learning. One way that the effects of CI as an intervention have been studied is by using sociometric questionnaires. For example, Cohen and Lotan (1995) studied 13 classrooms (grade 2-6) with a high proportion of emergent bilingual students; the researchers asked elementary students to name their favorite work partners

during mathematics and their best friends in class to create a status score for each student. The status score was a simple tally each time a student was chosen as a work partner or friend. The tallies were combined and used to create a ranking with particular attention to the students with lowest-third and highest-third of status scores. The researchers observed and counted the students' on-task group participation rates before and during intervention. In this study, the teachers' use of expectation treatments had a statistically significant positive effect on students ranked within the lower third by status score. A sociometric questionnaire was also used in the study by Cohen et al. (1990); in this study status was operationalized through a similar status score; yet, the survey asked students to name students that were "best at math and science" (p. 207), "best at games and sports" (p. 207) and best-friends. This study took place in nine bilingual classrooms of grades 2-4 across five California districts. For students in the treatment classrooms (where the teachers implemented the expectations treatments), the mean rate of on-task talk had a statistically significant increase for students in the lower third of the status score ranking. Moreover, there was not a statistically significant difference in the rate of on-task talk between students classified in low-, medium-, and high-status ranks that were in the CI classroom; this was not true in the comparison classrooms that did not receive the CI intervention. Unfortunately, in both the intervention and comparison group, students with a high-status rank by the sociometric questionnaire had higher rates of offering assistance to their peers; however, the disparity was diminished within the intervention group. These studies highlight the promise of CI to increase student-to-student interactions in elementary classrooms and diminish the formation of status hierarchies. The method of developing a status score through sociometric surveys also reveals how students' expectations of another's ability to contribute to the group is

not only related to perceptions of ability (i.e., “best as math and science”) but also related to non-academic characteristics such as friendship groups and athletic ability.

The other components of CI have also been studied and related to students’ achievement. For example, Ben-Ari (1997) studied the interactions of over one-thousand students in grades 3-5 while learning mathematics and determined that quality of CI implementation influenced students’ learning. In this study, the quality of implementation was indicated by the teacher delegating authority (as opposed to directly supervising) to students as they proceeded through ill-defined tasks and the use of interventions that supported students to share their thinking with one another. Similarly, Cohen et al. (1995) studied five middle school social studies classrooms and also determined that the quality of implementation influenced student achievement. All teachers in this study received professional development and classroom follow-up coaching regarding their implementation of CI. Students in classrooms where the teachers avoided direct supervision had higher rates of on-task interactions which in turn was related to higher achievement on a standardized test. Lotan (2008) studied the quality of implementation in social studies classrooms with emergent bilingual students. In this study, students classified as having only transitional English skills would have ordinarily been segregated to a sheltered instruction course; however, the students were integrated into courses with emergent bilingual students that were considered more English fluent. Lotan explains:

Student-student interaction is the cornerstone of complex instruction and the main precursor of student learning... The emphasis on securing equal-status interactions among native, native-like speakers and English learners increases the probability of significant participation of all students in the learning process (p. 190).

The use of expectation treatments to foster student interactions is an integral component of the overall quality of implementation. Lotan explains that “the quality of the implementation of

complex instruction was related to student outcomes” (p. 198) and that the students designated as transitional made greater gains and scored on the average as high as the other students classified as emergent bilingual. In contrast to these three studies that point to the potential benefits with quality CI implementation, Bianchini (1997) documented a case in a middle school science classroom where status hierarchies emerged as predicted. Bianchini used a sociometric survey to rank students by popularity and academic ability which predicted the observed status hierarchies. Bianchini notes that she never observed the teacher assigning competence which is one reason the status hierarchies were not ameliorated. Taken together, these studies point out that the quality of CI implementation—including the use of expectations treatments such as assigning competence—is crucial to reaping the potential benefits of CI. Moreover, these studies demonstrate the CI can be an effective tool beyond elementary classrooms.

The case of Railside High (Boaler, 2006; Boaler & Staples, 2008; Horn, 2008; Na’ilah Suad Nasir et al., 2014) provides an exemplar and compelling case of a mathematics department implementing CI and has been written about extensively. In this ethnically and socioeconomically diverse high school, students learned to value different ways of thinking and reasoning mathematically. The students’ standardized test results significantly outperformed students in a more affluent high school with traditional mathematics instruction. Boaler and Staples (2008) demonstrated that the principles of CI, implemented at Railside High School contributed to equitable outcomes in terms of achievement, as well as respect among students from varied backgrounds—an outcome she termed *relational equity*.

Learning to Implement CI

Although Railside High is a well-documented case of the successful implementation of CI, little is known about how teachers learn to enact CI (Harper, 2019). Lotan (2006) and Oslund

(2016) have argued that learning CI is difficult because its principles run contrary to most adults' experiences in learning mathematics. Most adults learned school mathematics through narrow tasks which focused on the memorizing procedures in solitude. As demonstrated above, CI's groupworthy tasks ought to be open-ended and attend to big, conceptual mathematical ideas. Difficulties in learning to implement CI include the development of open-ended tasks that afford multiple mathematical competencies (Crespo & Harper, 2019), development of facilitation styles that do not save students from struggle but rather relinquish intellectual authority (Cohen & Lotan, 2014; Pescarmona, 2010), and seeing and responding to status (Lotan, 2006; Pescarmona, 2015; Swanson, 1997). Despite the difficulties in learning the multiple facets of CI, it is learnable with sustained coaching and feedback for both practicing and preservice teachers (Ellis & Lotan, 1997; Swanson, 1997). The difficulties of learning to CI are in part due to the non-routine nature of CI and conflicts with the cultural norms of mathematics teaching which are both discussed next.

Non-Routine Aspects of CI

One reason that CI is difficult to implement well is because of the non-routine aspects of pedagogy. In typical mathematics instruction a teacher might first introduce a concept or procedure and then ask students to apply the procedure through a series of exercises. With this type of instruction, which uses narrow tasks, the teacher can anticipate a range of responses and then monitor students' application of the procedure according to predefined set of criteria. With groupworthy tasks, the range of possibilities with regard to the way the students may approach the task is greater than with narrow, procedural tasks. Rather than monitoring students' application of a procedure, the teacher needs to be aware of how students are approaching the problem so that unique and/or unanticipated methods or strategies can be used to assign

competence. Cohen, et al. (2004) studied the implementation of CI by preservice teachers to find that, indeed, the non-routine components were the most difficult aspects for the preservice teachers to implement. Cohen, et al., argued that the routine aspects, such as composing groups, assigning roles, and teaching group process skills were easily carried by the teachers and consistently implemented. Similarly, Anthanes (2018) documented that the superficial aspects of CI, putting students in groups and assigning roles, were easy for teachers to implement. Yet, the superficial aspects, or routine aspects, easily fall short of the larger goals to create equitable opportunities for learning. Aspects of implementation such as choosing appropriate groupworthy tasks and choosing when and how to intervene in groups were more difficult to implement. Once students are in groups many teachers report difficulty in delegating authority to students and then teachers may provide too many directions to students (Pescarmona, 2010).

Cohen et al. (2004) found that the capacity of the preservice teachers to implement CI was enhanced through the use of coaching sessions in which the preservice teachers received systematic feedback with regard to the nonroutine components. Cohen et al. reported that the number of coaching sessions was a powerful predictor of the quality of overall implementation. These authors recommended that teachers learning to implement CI receive several observations and related feedback session. For instance, in this study with prospective teachers, the authors noted that nine observations with three feedback sessions (one feedback session after three observations) seemed to be a threshold level that aided the quality of implementation. Cohen et al.'s argument for intensive feedback is consistent with prior studies that documented the need for in-class support in durations of a year or longer (Cohen et al., 1994; Lotan et al., 1998). "How long does it take to develop expertise in Complex Instruction? A long time" (Cohen et al., 1994, p. 93).

An essential non-routine aspect of CI is the act of assigning competence. As discussed earlier, the use of non-routine or ill-structured tasks are used to “mix-up” students’ expectations of one another as to who will be able to contribute to the group’s efforts. Once students’ expectations of one another are disrupted, the teacher should also use assigning competence, specifically toward those students that the teachers perceived to be positioned as lower within a status hierarchy. The assigning competence strategy is non-routine because the teacher may not necessarily know who will be positioned as low status within any task, although the teacher may certainly make useful predictions based on prior experiences and status characteristics. Furthermore, the teacher must catch the student in the act of being “smart” in the moment—often in a way that the teacher may not have anticipated beforehand. This is not the same as evaluating students’ contributions in relation to predefined goals; rather, assigning competence requires that teachers think expansively and find ways to “underline the contribution that each student makes” (Pescarmona, 2015, p. 36). Bianchini (1997) highlighted that when the important aspect of assigning competence is omitted from enacting CI, status hierarchies are likely to form in ways that they would have formed without CI. Learning to assign competence is not easy and it takes time to develop this new way of interacting with students during small groupwork. Lotan, et al. (1998) documented in their work with practicing elementary teachers, that it took about four months of implementation and periodic coaching before they saw teachers assigning competence.

Cultural Norms of Teaching Conflict with CI

Another reason that learning CI is difficult is because the basic tenets of CI conflict with many of the cultural practices in schools (Baldinger, 2017; Louie, 2016, 2017b; Oslund, 2016). The nature of mathematics tasks in CI is different from the traditional western-school

mathematics that portray the discipline in narrow ways that privilege computation and application of memorized algorithms (Boaler, 1998; Featherstone et al., 2011). The shift in the nature of the mathematics in groupworthy tasks requires that teachers develop a new understanding of their roles as teachers (Pescarmona, 2010). Rather than supervising students to carry out predefined procedures, teachers must monitor how students are working together and encourage each other to use each other as resources, without contributing to the creation of status hierarchies. The dominant culture of teaching is steeped in seeing students through lenses of hierarchy and ability (Louie, 2016; Parks, 2010). These lenses, or frames, are in conflict with the theory that supports CI (Expectation States Theory) and make it difficult for teachers to interpret students' actions and behaviors so that the teacher can respond in productive ways. For instance, if a teacher is to interpret a student's lack of engagement during groupwork as a difference in ability then it makes sense for the teacher to allow the "smarter student" to teach and monitor the group's work; however, if a teacher is to interpret a student's lack of engagement due to underlying status characteristics, such as being a girl, then it makes sense for the teacher to intervene in alternative ways (i.e., assign competence, facilitate group processes) that create opportunities for the student to be recognized as competent. One way that mathematics teacher educators have supported teachers in learning CI is through the notion of teacher noticing.

Teacher Noticing and Status

Enacting CI requires that teachers be able to "see" status to be able to respond to the formation of status hierarchies. Teacher noticing is the sense making practices of teachers as they are confronted with a "booming, buzzing confusion of sensory data" (B. L. Sherin & Star, 2011, p. 69) in the classroom. Teacher noticing research is grounded in Goodwin's (1994) notion of

professional vision in which he asserted that each profession has developed “socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group” (p. 606). To become a CI teacher means to start seeing, perceiving, and interpreting status in certain ways. van Es and Sherin (2002) argue, “how individuals analyze what they notice is as important as what they notice” (p. 575), because the interpretation has implications for subsequent pedagogical decisions. Crespo and Featherstone (2012) argued that learning to notice status is important within teacher preparation because the language of “status” can replace the language of “ability” which in turn allows the teacher to think sociologically to fix conditions of the learning environment so that all students have rich opportunities for learning. Prospective teachers can notice status in various ways, as has been documented across various studies (McDuffie, Foote, Bolson, et al., 2014; McDuffie, Foote, Drake, et al., 2014; Turner et al., 2012).

McDuffie, Foote, Drake, et al. (2014) reported on the use of four lenses to cultivate prospective elementary teachers’ equity-oriented noticing. One lens, power and participation, was specifically related to notions of status in that it guided teachers’ observations toward seeing differences in the quantity and quality of students’ participation in mathematics class as they watched publicly available mathematics teaching videos. Over the course of a semester, the prospective teachers noticing deepened from only noting differential participation by also noting how differences in participation were related to the teaching moves, status, and development of mathematical authority. Jilk (2016) facilitated a series of professional development to help mathematics teachers notice status issues and identify students’ mathematical smartnesses. Over time, the teachers learned to name not only mathematical competencies, but also the participation norms that students developed as strengths (i.e., asking a question). In this study, teachers

watched videos of their own and colleagues' teaching in which status issues occurred, but the naming of specific status issues, or how status was visible to the teacher was not analyzed. Baldinger (2017) and Louie (2016) engaged practicing teachers in learning to see status through coaching sessions. Baldinger (2017) engaged teachers in reflective conversations, without the use of video, and reported that a coach was important in helping teachers to re-interpret classroom events in terms of *status* and the social organization of the classroom, versus interpreting events in terms of compliance issues. Similarly, Louie (2016) engaged one teacher in noticing status issues and argued that CI runs counter to the dominant ideologies of school practices; noticing status issues and naming the strengths of students with non-dominant identities was difficult for the teacher in this study because it ran counter to the district and department norms (of naming and remediating deficits). The teachers in these studies were enacting CI in their own classrooms. These studies highlight that practicing teachers find it difficult to name students' strengths and interpret classroom events through the lens of status. Yet, recognizing status and interpreting status is important for the skillful implementation of CI. Status, when recognized as a sociological function of the group, can lead to responding with expectation treatments such as assigning competence to students perceived to have low status.

As a whole, these studies document that through repeated video engagement and coaching, preservice and practicing teachers can learn to see status in terms of students' participation, body language, and influence. It is not surprising that teachers across the studies that employed teacher noticing also found it difficult to transfer their learning from the professional development setting into being able to respond to students in real-time in a classroom setting. Similar findings were reported by Oslund (2016) and Pescarmona (2015). Early evidence by Lotan et al. (1998) and Swanson (1997) noted that a crucial component of

learning to implement CI is direct feedback on the element of learning to identify status issues and respond by assigning competence.

Summary

In this chapter I have synthesized the literature regarding CI, with regard to the pivotal notion of status. First, I reviewed key components of the pedagogy, including expectation treatments, groupworthy tasks, and group roles. I demonstrated how the notion of status informs each of these key components. I highlighted how each of the components are a mechanism to alter students' expectations of each other's ability to contribute to the success of the group. Next, I reviewed empirical studies that demonstrate the potential for CI to foster equitable learning environments. As a part of this review, I highlighted that the quality of implementation—particularly the aspect of assigning competence—was an important component linked to the disruption of status hierarchies. Lastly, I reviewed the literature regarding learning to implement CI. CI is difficult to implement, in part, because of the non-routine aspects, such as assigning competence. In addition, the types of open-ended groupworthy tasks and the broad ways that students may demonstrate competence in those tasks conflict with many of the cultural norms of school mathematics. The review of this literature also documented learning to implement CI is a long process and has been aided through coaching with an intensive focus on learning to see and respond to status. This literature review ended with the role of teacher noticing as an influential framework in learning to see and respond to status. Overall, this literature review demonstrates the key role of status within CI, yet the difficulty in learning to productively respond to status as prescribed.

The next chapter, Theoretical Framework, begins with a deep dive into the construct of status from Expectation States Theory. I then share the theoretical framework that guides the

current study. The theoretical relates the construct of status to the construction of *kinds* (Hacking, 1986, 2007) of students.

THEORETICAL FRAMEWORK

Status as a Construct from Expectation States Theory

In early attempts to describe the basis of societal inequalities Max Weber (1864–1920) described three interrelated sources of inequality: power, wealth, and status (Weber, 2009). According to Weber, these points of demarcation could account for the inequalities in modern industrial societies. Power, for Weber, was the ability to get the other to comply despite their resistance. Wealth referred to material resources. For Weber, status was related to deference and social position, which was closely related to power and wealth. In contemporary sociology, status is a well-defined construct. Status, as defined by Ridgeway (2019) is “a comparative social ranking of people, groups, or objects in terms of the social esteem, honor, and respect accorded to them” (p. 1). Defining status, though, does not explain how status accumulates and is bestowed upon some individuals and/or groups and not others.

The earliest ideas related to status connected access to material wealth and/or resources to the conference of status. This view of status is related to a *dominance perspective*. The dominance perspective explains that status builds because humans defer to others so that an individual can get some access to material goods. Within the realm of education (particularly mathematics education and status hierarchies within groups) status is often discussed in terms of a dominant or assertive student (in contrast to other students). From the dominance perspective, humans are intimidated by a group or individual and therefore defer to them for access to the valued resources for survival. In this way, interpersonal hierarchies are built. In mathematics classrooms, important resources or goods can be thought of as “mathematical smartness” or “know-how”. In short, this is a “pecking order” theory in which the “most dominant gets first access to the valued goods” (Ridgeway, 2019, p. 23). Yet, as Ridgeway explains, a pecking order

is not an efficient way to organize a society in which individuals are mutually dependent on one another for productivity and survival. In part, because dominance doesn't incentive the most dominant person to contribute to the collective effort.

In contrast to the dominance theory, Ridgeway (2019) argues for an evolutionary approach to understand how status hierarchies emerged within society and how those hierarchies persist. This view aligns with the notion of status as it was originally employed within CI (Cohen & Lotan, 2014). As such, I will briefly expand on the evolutionary approach. Ridgeway states that status, as prestige orders, is:

based on respect and admiration freely granted to another because of the other's perceived ability to offer useful cultural information [...] The idea is that by giving status and deference to those with superior information, the deferrer gains an opportunity to come closer to the superior person and learn his or her skills and information, which provides an evolutionary advantage (p. 24).

Ridgeway illustrates that status hierarchies that emerge among interactants in experimental and classroom settings are more like prestige hierarchies than they are like dominance hierarchies. Within status hierarchies as orders of prestige there are indeed components of assertiveness and dominance, but in the settings where status hierarchies emerge in a predictable way there is a collective goal. Groups with a collective goal find it "legitimate and necessary to take into account each other's contributions when completing a task" (Correll & Ridgeway, 2006, p. 31). Examples from informal settings include Parent-Teacher-Association ("P.T.A.") projects and juries, such as developing a presentation to the school board to fund an arts program, or coming to a unanimous conclusion regarding the fate of a defendant. Examples from classroom settings include the dreaded "group project" or CI's groupworthy tasks. Collective goals guide actors

away from individualistic goals. In the evolutionary account of status, dominance is attenuated by the formation of status hierarchies because actors are incentivized to:

redirect their energies from self-focused, domineering behaviors into agentic, proactive efforts in service to the collective task. These agentic task efforts have the effect of making the actor seem more competent and valuable to the group and thus earn status and influence (Ridgeway, 2019, p. 27).

From this perspective, Ridgeway argues that status is created through a “cultural schema of status” (p. 20). The cultural schema of status has two components: *the* basic norm for allocating status; and a shared set of status beliefs.

The basic status norm, Ridgeway (2019) argues, is a shared assumption that “deference and status should be granted in proportion to an individual’s perceived competence at the collective goal effort” (p. 37). This norm is “deeply embedded in our cultural understanding of how to organize everyday social relations in goal-interdependent circumstances. It acts as a kind of social grammar—a set of rules—for status relations” (p. 38). This makes sense in the fact that whenever we interact with others, if we presume competence of an individual we defer to their expertise because it is likely that their expertise will aid in the group’s accomplishment. For example, the plumber and I are collectively interested in installing the toilet correctly; however, I will grant status to the plumber and follow their directions because I know they are more competent than myself. Directly applied to mathematics classrooms, as children work in groups with their peers, the basic status norm posits that students will typically defer to an individual who they perceive to be more competent at the task. (Spoiler alert: as Expectation States Theory and this study will demonstrate status is not only conferred according to perceived competence.) As discussed in the literature review, students’ assignment of status to one another has been repeatedly demonstrated in the mathematics education research literature. The deference to a

student that is perceived as more competent will efficiently move the group toward the completion of the task. What is not made clear in this first aspect of the basic status norm is how perceptions of competence are first created. Further, in a mathematics classroom, the students' goal may be to complete the task; the teachers' goal (and hopefully a goal for the student too) is to learn (mathematics, cooperation, etc.).

The second aspect to the twofold cultural schema of status, as argued by Ridgeway (2019), is the continually changing set of status beliefs. Status beliefs are used to anticipate who will be judged as more competent, and therefore, more valuable to the group's efforts. Status beliefs are the "widely held cultural beliefs that link a recognized social difference among actors with a greater or lesser status-worthiness and competence" (p. 69). These widely held cultural beliefs can be thought of similarly to stereotypes. In the grand scheme of society, social differences such as age, race, and gender invoke perceptions of competence (Fisk & Ridgeway, 2018). For status beliefs to form, Ridgeway states:

both those in the social difference group favored as better and those disfavored as lesser must come to *agree*, as a matter of social reality, that those in the favored group are viewed by society as more esteemed and competent than are those from the other group. This is the hallmark of status beliefs—that the evaluative rank order among the groups is acknowledged by all the groups involved. For status beliefs to develop, then one group must overcome its tendency to see itself as better and accept, or at least concede, that the broader community sees the other group as better than them (p. 71).

An interesting aspect of the status beliefs is that the group that is perceived as less competent must somehow accept such a position in the interaction. This seems somewhat counterintuitive, but as Ridgeway explains, the formation of a status belief does not mean that individuals must *believe* the status belief. Rather, for the status hierarchy to emerge, those positioned as less competent must only act as if they believe that others are acting on such a belief. This is to say,

status beliefs are not personal beliefs (first-order beliefs) about an individual or group's level of competence. Additionally, status beliefs are not second-order beliefs about how other individuals might rank or order the competence of the individuals in a group working together. Rather, status beliefs are third-order beliefs. Third-order beliefs are about an understanding of the "typical views of the community as a whole" (p. 71). Said differently, third-order beliefs are about how a person believes "most" people will evaluate and judge the competence of the group members. This makes for an interesting way for individuals to monitor their behavior within group goal-oriented interactions. Individuals do not need to act in accordance with their own ranking of the individuals; individuals will act based on the way "most people" think they will act. This means that status beliefs are "not just shared knowledge but common knowledge" (p. 72). In this way, individuals monitor their own interactions based on "common knowledge" which is a way to safeguard and reduce individual risk since they behave in a way that they assume the others expect them to act. Ridgeway (2019) states it this way: "common knowledge status beliefs allow group members to quickly form roughly consensual judgments that they can confidently act on in a coordinated way to enact the status hierarchy and enforce the basic status norm" (p. 75).

But this explanation has still avoided the larger question: How do the initial status beliefs get formed? How do status beliefs, once formed, persist? To answer these questions, I turn to Status Construction Theory (Ridgeway, 2015). Generally, Status Construction Theory describes that "repeated encounters created shared status beliefs about social differences. And once people acquire a status belief, they teach it to others by treating them according to it in subsequent encounters, potentially spreading it widely to the population" (Ridgeway, 2019, p. 83). For instance, a student may encounter groupwork where an Asian student is deferred to and leads the group's efforts—implicitly being taught the status belief. Guided by this experience, in later

encounters the student may defer to other Asian students—implicitly teaching and reinforcing the status beliefs to other. Even without ever hearing the “Asians are good at math” narrative (Shah, 2017) the status belief can form and persist. Explicitly hearing the narrative, though, may strengthen the status belief.

Multiple experiments have described two elements to the formation of status beliefs (Berger et al., 2014; Bianchi & Shelly, 2020; Corra, 2020; Kalkhoff et al., 2020; Kalkhoff & Thye, 2006; Simpson & Walker, 2002; Thye et al., 2006). First, an individual must have an experience (that is goal-oriented and requires interdependence) in which an association between a social marker (race, gender, class, prior achievement) and competence is made salient. This association can be through an explicit association, for instance as when a researcher tells the participants, falsely, in an experiment that women do really well on a task. Or implicitly when a researcher tells the participants that they have comprised a group of mixed abilities to complete a task in the experiment and the group members are racially different. Secondly, the initial status belief must become validated by a broader audience beyond the initial context. In this validation of the belief, it must not necessarily be an explicit validation, but an implied third-order validation. That is— the individual must believe others are acting as if they have accepted the status belief that is in formation. Accept, or at least not explicitly challenge it.

The ideas from Expectation States Theory, particularly the role of *status* in group processes, were taken-up in the creation of CI to explain differences in students’ participation in classrooms. The pedagogy of CI seeks to ameliorate the effects of status on students’ learning and achievement. I now turn to briefly and directly relate Expectation States Theory and status to CI.

Complex Instruction and Status

Complex Instruction (CI) (Cohen & Lotan, 2014), a pedagogical approach to designing and facilitating small group work with heterogeneous students, was introduced in the early 1990's by Elizabeth Cohen. Cohen introduced the principles of CI as a teaching method in the first edition of *Designing Groupwork* (Cohen, 1986) after studying small group interactions from sociological perspectives that employed Expectation States Theory and Status Construction Theory. Cohen, along with Noddings (1989) argued for use of groupwork partly to develop students' social and moral behavior, especially across markers of social difference. As most individuals who have gone through U.S. schooling will likely state, groupwork is all but equal among group members. CI as a method approaches the unequal distribution of work, and the subsequent distribution of opportunities for learning as a problem of *status ordering*. *Status ordering* as defined by Cohen (1994) is “an agreed-upon social ranking where everyone feels it is better to have a high rank within the status order than a low rank” (p. 27). The status order is a status hierarchy where some members of a group “are more active and influential than other members of the group” (Cohen, 1994, p. 27). How certain members of a group are more likely to become more active, or attain more influence, is theorized with Expectation States Theory (Correll & Ridgeway, 2006), as described in the previous section, above. Expectation States Theory is generally concerned with how inequitable structures emerge within a society and are then sustained through interactions. The notion of status is central to explaining this process and central to CI.

The literature related to CI highlights two components of status: *status characteristics* and *status beliefs*. *Status characteristics* are the “socially significant attributes of individuals” (Correll & Ridgeway, 2006, p. 32). These attributes can be diffuse, such as gender and/or race,

which generally are socially significant across contexts. Other status characteristics can be specific—such as mathematical ability—and be socially significant in limited contexts (i.e., in a mathematics classroom). Secondly, is the idea of *status beliefs*, the “social representations that consensually elevates one category as more status worthy and competent than another” (Correll & Ridgeway, 2006, p. 32). The formation of a status ordering in small groupwork in mathematics class occurs in this way: when individuals come together to complete a joint task (e.g., groupworthy) the individuals rely on their categorization of their peers about specific and diffuse status characteristics and combine those categorizations with cultural knowledge (i.e., status beliefs) to form expectations regarding each members’ ability to contribution to the success of the group.

Making Up Students

In the remainder of this chapter, I describe my theoretical framework which concerns how the notion of status has been appropriated at different rings of discourse. Figure 1 (below) represents the theoretical framework and consists of three rings. The outer ring of discourse consists of power/knowledge discourses (Foucault, 1980). In the most general sense, this outer ring of discourses creates what is think-able within a given socio-historical context. The innermost ring of discourses consists of the everyday interactions among people. For this ring, I draw on Goffman (Goffman, 1967, 1974) to explain how through everyday interactions, people recreate social realities. I bring these two scholars together in a complementary way because Foucault’s interests related to discourses was most concerned with “top down” discourses which work their way into people’s everyday interactions; however, Foucault did not analyze the details of interactions. Conversely, Goffman’s theorization concerned “bottom-up” accounts for how

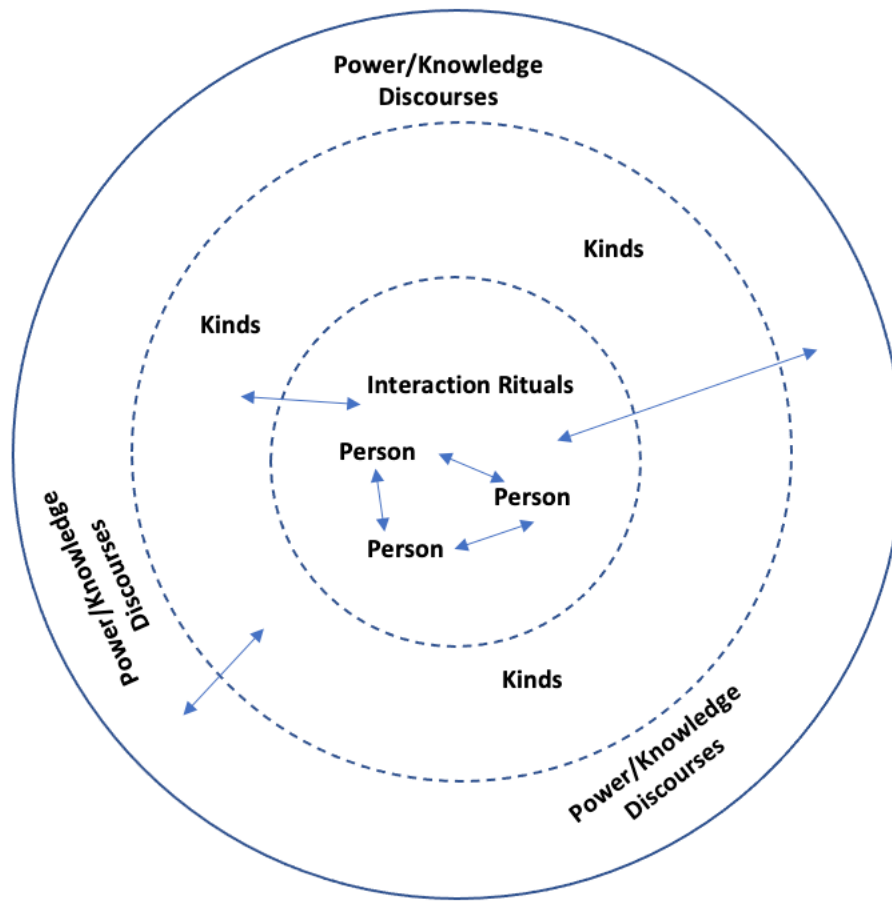
individuals constitute themselves within interactions. Goffman's analytic tools help to look at discourses close-up within interactions. As Perrson (2019) explains:

[Goffman] kept the authorities behind the scenes in a state of alert and focused more – that's bottom up – on interacting individuals' conduct (without using that particular word). The individuals are presented as self-regulating actors inside an interaction order supervised by the authorities (p. 128).

Having “kept the authorities behind the scenes,” Goffman's analysis of interactions did not account for the origins of the “authorities” – the power/knowledge discourses – that influence conversations and interactions. The closest Goffman gets to ideas similar to power/knowledge discourses are frames, more fully explained below, that influence interactions. By bringing together Foucault's theory of power/knowledge discourses and Goffman's theory of interaction rituals, this theoretical framework allows us to more fully understand how discourses and everyday interactions “make up” kinds of people (Hacking, 1986).

The “made up” people that this study is most concerned with is students in mathematics classrooms – particularly “low-status” students. The constitution of *kinds* (Hacking, 1999, p. 72), or “made up” people is what comprises the middle ring of discourses. Hacking (2007) succinctly describes this inner ring of discourses: “Sometimes our sciences create kinds of people that in a certain sense did not exist before. That is making up people” (p. 293). Said differently, power/knowledge discourses (Foucault, 1980) make it possible for people to be recognized among others as certain *kinds* of people. Each of these rings interacts with the other rings, in what Hacking (2007) described as a “looping effect” (p. 286). At this point I want to note that the rings of discourses represented in Figure 1 are not hierarchical, but more like a tesseract rotating in four-dimensional space—at once on a surface and within.

Figure 1: Theoretical Framework Representing Rings Producing Kinds



Goffman's (1959, 1967, 1974) theories have been interpreted as structuralist and symbolic interactionist (Heinich, 2019). Goffman (1974), in *Frame Analysis* stated, "This book is about the organization of experience [...] and not the organization of society" (p. 13). I make no attempt to classify his work, but for this study, I draw on the tradition of symbolic interactionism (Jungwirth, 1996; McCall, 2018) to interpret my reading of Goffman and to inform the theoretical framework. In reading Goffman from the symbolic interactionist standpoint, individuals are constantly making meaning and "reading" this situation. In "reading" the situation all there is to aid in the interpretations of ongoing interactions are the available discourses (Foucault, 1980). Part of what is available in the discourses are *kinds* (Hacking 1999,

2007) of people. This is quite different from a structuralist interpretation of Goffman which might lead one to conclude that individuals' interactions are determined by background structures or frames.

Having provided a summary of the theoretical framework, I will now more fully elaborate on each of the rings. I will start with the outermost ring of power/knowledge discourses and work my way toward the inner ring of interaction rituals.

Power/Knowledge Discourses

Foucault used the word discourses to describe more than just language and syntax. Rather, discourses are something larger that provides access to ideas. Fendler (2010) provided a useful analogy that related discourse, in the Foucauldian sense, to the internet. Just as the “internet is everything we can access with a browser [...] discourse is everything we can access with our minds” (Fendler, 2010, p. 36). Once something is put on the internet, then we can access it with a browser. Yet, before it is put on the internet, we cannot access it because it simply does not exist on the internet. Similarly, it is not until something is in discourse – put into thoughts or words – that we can think about it. If something has never been put into thought or words, then it is not in the discourse and seemingly does not exist. The internet metaphor highlights that discourse depends on people. Just as “the internet is created by people,” so too “discourse is created by people” (Fendler, 2010, p. 36). The internet and discourses are both constantly changing – however big or small – as people interact with them and what exists in the internet or within discourses is socio-historical. Foucault was particularly interested in how discourses were related to notions of power and used the term power/knowledge discourses to describe the relationship.

To Foucault (1980), power/knowledge discourses create what is thinkable and in return the discourses make available different subject positions. Power/knowledge discourses are not simply ideologies. To return to the internet analogy, Fendler (2010) related a web-browser search engine to ideology. A web-browser sorts and filters information on the internet. Similarly, ideologies filter what type of discourses are (in)accessible to us. Even though some discourses may exist, they may not be accessible to some individuals. Foucault's account of the "homosexual" in the *History of Sexuality* (Foucault, 1978) provides an example of how power/knowledge discourses work. Foucault argues that the subject position of homosexual became available in the discourses of the 18th century. Sexuality had been within discourses for centuries, but the ways that sexuality was discussed in the beginning of 18th century introduced a new subject—the homosexual. He argues through historical evidence that the homosexual had always existed, but in coordination with new technologies and demography of human populations the homosexual came into being (Foucault, 1978). This is what Hacking (2007) would call a *kind*. The creation of the homosexual subject is an example of *power*. Discourses operate as "discursive regimes" (Foucault, 1980, p. 113) that regulate what is thinkable and the conditions under which new knowledge can be created. New discoveries, say medical discoveries or the scholar's identification of a "new" kind of person, happen not simply because of advances in technology but with "a modification in the rules of formation of statements which are accepted as scientifically true" (Foucault, 1980, p. 112). That power and knowledge have effects on peoples' subjectivity is the idea of *power-knowledge*.

Power-knowledge is one aspect of Foucault's concept of *power*. He identifies other types of power (i.e. judicial, pastoral, bio), but the general sense is that creation of knowledge is power; knowledge creates a *regime of truth* through which discourses operate. This conception

of power moves past an individual and/or the State holding power. Power in this sense reinforces notions of power as authority and repression. Foucault (1980) states:

But it seems to me now that the notion of repression is quite inadequate for capturing what is precisely the productive aspect of power ... What makes power hold good, what makes it accepted, is simply the fact that it doesn't only weigh on us as a force that says no, but that it traverses and produces things, it induces pleasure, forms knowledge, produces discourses. It needs to be considered as a productive network which runs through the whole social body, much more than as a negative instance whose function is repression (p. 119).

Power is creative. For instance, power created the notion of the homosexual. This is not to say that the State and other types of power are not important, but they mask the effects of power.

Although power can be liberatory, it is important to recognize how power can in many ways be *disciplinary* (Collins, 2009). Disciplinary in this sense is about regulation of oneself. Individuals may regulate themselves in accordance with social norms to be seen and read as "normal." Power-knowledge contributes to the discourses about what is normal, for instance in medicine's guidelines for health (i.e. what to eat, quantity of exercise). Ideas of gender can also be understood through the disciplinary concept of power-knowledge. The dominant discourses (including popular-cultural narratives) reify images of what it means to be a boy/man or a girl/woman through hypermasculine stereotypes and femininity. As well as who can be good or successful in mathematics.

Mathematics education, as a field, operates within power/knowledge discourses that creates knowledge about students. For instance, Horn (2007) illustrate how the systems and practices of school contributed to teachers' reasoning about *slow kids*, *fast kids*, and *lazy kids*; Nolan (2012) described pervasive discourses prospective teachers used to make sense of their student teaching experiences, including traditional classroom structures, cultures of testing, and

building students' mathematical strength. In addition, students are surveilled during schooling to determine who has a growth mindset or grit (Kirchgasler, 2018). Girls are studied as certain types of learners with various roles and obligations in mathematics classrooms (Walshaw, 2001). Such discourses about mathematics classrooms bump against and combine with discourses about youth and adolescence (Lesko, 2012) that paint middle school students, and adolescence in general, in "storm and distress." The point here is that power/knowledge discourses operate in schooling and mathematics education that make it possible and sensible to talk about students in various ways. I now turn to discuss such power/knowledge discourses in relation to creating *kinds* of people.

Making Up People

Within the milieu of power/knowledge discourses, *kinds* of people take form (Hacking, 1986, 2007). In the diagram of my theoretical framework, *kinds* appear in the middle ring – between the power/knowledge discourses and interaction rituals that both, in some sense work to (re)create *kinds*. Hacking (1999) argues that sociologists have continuously classified people as objects. For instance: refugees, child television viewer, homosexuals, mentally ill, men, and women. The practices of schooling classify students according to reading level, grade level, mathematical track, honors, English language learners, "learning styles," and more. Hacking argues that when people are categorized as objects it creates an illusion of a "coherent object" for which data can be collected about. Hacking (2007) calls this process *Making Up People* and this refers to the ways "a new scientific classification may bring into being a new kind of person, conceived of and experienced as a way to be a person" (p. 285).

Hacking (2007) and Foucault (1972) describe a similar process through which people are "made up" or new subjectivities become available with discourses. For Foucault, the first step is

a point in which a description of an object is created. An initial language or writing provides the first step to think about the object, which is required for there to be discourse. For Hacking (2007) this first step of thinking about an object and describing that object is directly related to the classification of people. As Hacking states, “classification is usually within a category, a most general principle of classification” (p. 288). For instance, within the category of students there are classifications in terms of learning disabled (Sleeter, 2010), fast and slow mathematics students (Horn, 2007), and low-status students (Cohen & Lotan, 1997). Foucault argues that it is these labels and classifications that create the discourses so that it is possible for people to talk about the objects (the people) to which the label has been applied. Over time as the discourses spread, individuals come to be identified as – or identify themselves –according to the available categories. At this point, Hacking (2007) states institutions “firm up the classifications” (p. 288). By firming up the classifications, Hacking means that institutions – “established organizations” (p. 288) – such as government offices like the Census Bureau or university researchers begin to manage the classifications by deciding exactly what counts as x, y, or z type of person. Consider the *Diagnostic and Statistics Manual* (“DSM”) for medical doctors as one example. Specific to education classifications that have been firmed up include, “English Language Learners,” “urban students,” “honors students,” and so on. Shah et al. (2021) note that many times classifications (e.g., “urban students”) are coded language that draw on implicit stereotypes and have the potential to harm students. Foucault (1972) calls this aspect the “scientificity” in which the object can be argued about. In terms of Hacking’s human objects, “scientificity” coincides partially with the practices of demography in which humans are counted and count. For Hacking this procures “knowledge about the kind of people in question, their characteristics...” (p. 289). Lastly, is the stage of “formalization” which is the point where the idea is so widely talked about

that the category is common-sense. For Hacking this is the point at which there are “experts” who speak about *kinds* of people with a sense of authority. Although Hacking describes a general process in the creation of *kinds*, he states “I see no reason to suppose that we shall ever tell two identical stories of two different instances of making up people” (p. 236). This is because the *kinds* that emerge from power/knowledge discourses interact with the object itself – uniquely influencing one another in the co-creation of *kinds*.

Hacking (1986) explains that “once the distinctions were made, new realities came into being” (p. 224). Distinctions, classifications made among “experts” or those with a privileged voice to sort and classify people, make new possibilities for individuals to identify with – and thus new *kinds* of people are created. Of particular interest to this study is the classification of “low-status” and “high-status” students. The power/knowledge discourses of sociology started to describe actors in group situations as residing within two states – a low-state and a high-state that was indicated by social-identity markers (diffuse status characteristics, such as race and gender). As education theorists took up this idea in the formation of CI, students were labeled as “high-status” and “low-status” students. It is not just the labels, though. The mere act of naming and labeling does not do the work of making up people itself. Making people up happens because of the interactions in the world: the interactions among the people labeled, experts, the institutions using the label, and the knowledge that is generated (Hacking, 2007). The role of experts, institutions, and knowledge is what Foucault (1972) highlights. These aspects interacting together create power/knowledge discourses. In the case of the power/knowledge discourse of CI, there are *kinds* of students that can be categorized as low-status and high-status. It was the introduction of CI that provided these *kinds* of students in schooling. Hacking complements

Foucault’s account by elaborating on the dynamics between the power/knowledge discourses and those who are labeled. This interaction is called the “looping effect” (Hacking, 2007, p. 286).

Table 1: Comparison of Foucault’s Formation of Discourses to Hackings’ Making Up People

Foucault’s Formation of Discourses	Hacking’s Making Up People
Positivity	Classification People
Epistemologization	Institutions
Scientificity	Knowledge Experts
Formalization	

To be clear, Hacking (1986,1999, 2007) does not argue that certain types of people (i.e., autistic child, gay men) do not exist before they are “made up.” Rather, Hacking asserts that before the label exists and before the power/knowledge discourses permeate society, certain *kinds* are not recognized as a way to be a person. As such, individuals could “not experience themselves in this way, they did not interact with their friends, their families, their counsellors, in this way” (Hacking, 2007, p. 299). Once the label is created, studied, and promulgated then there is a new “way to be a person, to experience oneself, to live in society” (Hacking, 2007, p. 299). In this “looping effect” where individuals draw on the power/knowledge discourses to be interpretable or make sense of other humans—their actions, interactions, and ways of being, the humans that are labeled/categorized interact with the process itself. This is similar to the way gender theorists have described the disciplinary self-regulation of behaviors to align with certain gender norms (Butler, 1988, 1990; Hollander, 2018; West & Zimmerman, 2009). With regard to Gender, Pascoe and Bridges (2016a) state:

to be culturally recognizable, we must all engage in performativity. That is, to be a man, one must cite the norms of masculinity (and vice versa to be a woman). For Butler, these citational practices actively create the very identity category itself—the category from which these practices are then said to emerge (p. 329).

The disciplinary aspect of power re-creates the dominant discourse of gender. Performativity of gender—and accountability to gender—is an effect of power/knowledge discourses. Yet, the meanings and associations of femininity and masculinity change over time as individuals push the boundaries of the categories in their performances of self. Hacking (1986) puts it this way:

What is curious about human action is that by and large what I am deliberately doing depends on the possibilities of description. To repeat, this is a tautological inference from what is now a philosopher's commonplace, that all intentional acts are acts under a description. Hence if new modes of description come into being, new possibilities for action come into being in consequence (p. 231).

This is to say that the classification provides images of ways of being a person. Once those images are available and individuals can make choices to align with, or identify with, a certain *kind* they may change their behavior. In this way to classification and the individuals may work “hand in hand” to “egg the other on” (Hacking, 1986, p. 228). The individuals and the meanings of the labels both subtly shifting and evolving over time.

In the classroom setting, hopefully, students are not aware of their label as “low-status” or “high-status” students. Regardless of knowing (or not) a specific label, evidence suggests students are keenly aware of their social position and academic position in classrooms (Hatt, 2012) As explained by Expectation States Theory, individuals act based on their perceptions of how others think they will act. Even though students might not ever interact with the label –

others' expectations for their behavior and contributions to the group do mediate how the students will interact. Furthermore, a teacher facilitating students working in groups in the form of CI is interpreting students' behavior through the lens of status. Since this is the lens that is employed within CI, teachers' actions toward the students are mediated by the label. For instance, if a teacher were to witness a student's idea being ignored, the teacher may then interact with that group and assign competence to the student. In this sense, the teacher as both an "expert" or an authority in defining who is low- or high-status is involved in the "looping effect." How does a student who is perceived as low status come to be perceived differently by their peers? The hypothesis from CI is that through expectation treatments, others' expectations will change and the student will eventually be recognized as more competent by their peers (and perhaps the teacher). The hypothesis asserted from the looping effect is that as the students change behavior due to altered expectations, the meaning of "low-status student" will also change; as such, a student might forever be trapped, by their peers or teacher, as a "low-status student."

Even though students may not directly interact with the labels of status to "see themselves in that way" (Hacking, 2007, p. 304) labels for which students are highly aware of are ubiquitous in schooling. For instance, students readily identify who is *smart*, or good at mathematics (Bishop, 2012; Dunleavy, 2018), jocks and burnouts (Eckert, 1989), and geeks (Barnes, 2000; Willis, 1981). These labels which are commonly assigned to students by other students are related to perceptions of smartness, which directly influence expectations of competence in mathematics classrooms. I now turn to the innermost ring which describes the everyday interactions among people.

Interaction Rituals and Presenting a *Kind*

As described earlier, Goffman's sociology concentrated on the small-scale interactions among people in everyday situations. In contrast to Foucault's (1972) "top-down" power/knowledge discourses which work their way into individuals' self-regulation (governmentality), Goffman worked "bottom-up" to reveal interaction rituals. Interaction rituals describe how interactions unfold in (often) predictable ways. For instance, consider an impromptu visit to a friend's house. In this visit, it is likely for the unexpected host to make a statement to apologize for the untidiness of the house: "I'm sorry, I haven't vacuumed in a few days." In this interaction ritual, the visitor would ordinarily reply with a statement to make the host feel more comfortable: "You should see the mess at my house," or "To my eyes it looks like you just vacuumed." But, consider an alternate reply: "I know you haven't vacuumed, but why are the shelves so dusty?" This breaks the scene. I'll elaborate.

The example I described above is one example of an interaction ritual within a particular event or context. Goffman illustrated that within interactions, people are concerned with maintaining the scene of the interaction ritual. Goffman uses a theatrical metaphor throughout his theory and analysis of human interactions. The interaction ritual is sustained because the actors all want "the show to go on" without a disturbance. A disturbance is like an actor breaking from the scene which reminds the audience that what they are watching is not real. Similarly, in a conversation in which a person does not follow the presumed interaction ritual (i.e., "why are the shelves so dusty?") disturbs the scene and the interactants are no longer as sure about how to interact – or how the other person wants the interaction ("the scene") to unfold. Goffman (1974) stated, "I do not intend here to provide a lullaby but merely to sneak in and watch the way the people snore" (p. 14). Goffman was interested to illuminate the way "the people snore" in

everyday encounters which unknowingly recreate interaction rituals, which in turn re/create *kinds* of people.

Goffman did not directly speak of *kinds*, but his focus on the interaction order illuminated that way that *kinds* can get recreated within everyday interactions. *Kinds* in Goffman's sense can be thought of as the usual suspects, archetypes, within a scene or storyline. I will further explain how Goffman's analysis of the interaction orders were coupled with additional concepts such as *impression management* and *framing*.

Impression management (Goffman, 1959) is the notion that individuals act in ways that align with how the individual wishes others to perceive them. Goffman makes a distinction between the "expression given" and the "expression given off" to highlight that one can give a certain expression, but it is never really known how that expression is "given off" – or perceived by other. It is presumed that if the interaction is working comfortably, and disturbances have been avoided, then the expressions given and given off are in alignment. It is in this sense that individuals manage their expressions. To be clear, individuals manage their expressions to be recognized as certain *kinds* of people, albeit typically in an unconscious way. But how does one decide which *kind* to play within an interaction?

Impression management works in tandem with Goffman's notion of *framing* (Goffman, 1974). To extend Goffman's drama metaphor, framing is the way the scene is set. It is the "scheme of interpretation for the meaning of an act" (Goffman, 1971, p. 231). Upon entering an interaction individuals must consider, "What is it that's going on here?" (Goffman, 1974, p. 8). Persson (2019) elaborates that an individual does not have to only read the scene to determine, "What is it that's going on here?" but they must consider how they fit within the scene. As such, individuals (unconsciously) consider: How do I usually act in such a situation? What do other

people expect from me in this situation? And, how should one act in situations such as this? If these questions are answered in accordance with the frame then the interaction moves along since the actors have a shared perception of reality (Persson, 2019); however, if an individual operates from a different frame then a “disturbance” may occur – an embarrassment, or a sense of awkwardness.

Impression management and frames can be related to the ideas outlined by expectation states theorists. As individuals manage their impressions, they are, in a sense, determining which status beliefs are at play. That is, individuals must consider the third order beliefs to decide how to act: *How do others expect me to act in this interaction? How do most people expect the others to act in this interaction?* The way individuals expect another to interact is related to the *kinds* that are expected within the frame (or scene). Some *kinds* have long sociocultural histories such as gendered kinds (i.e., men) and are related to diffuse status characteristics. Other *kinds* are localized to contexts and related to *specific status characteristics* (i.e., “smart math student”). Two examples from the mathematics education literature provide illustrative examples of the development of *kinds* of students. The first case was shared by Bishop (2012) and describes how peer-to-peer interactions over time created one friend, Teri as the “smart one,” and Bonnie as the “dumb one.” These local *kinds* developed out of their interactions together and then created expectations among the two girls about who should be deferred to and trusted on mathematics assignments. In this example, the diffuse status characteristic as girls, did not clearly define the frame. The second example shared by Langer-Osuna (2011) describes the case of Brianna being recognized as a smart mathematics student (a *kind*). Brianna, over time, became a “bossy girl.” One way to think about Brianna’s case is that the diffuse status characteristic of girl conflicted with her mathematical success. This is because, culturally, mathematics is thought of as a

masculine discipline (Mendick, 2006). In the parlance of Goffman, Brianna and the boys did not have the same “definition of the situation” – or come to their mathematical interactions with the same frame. Brianna entered the frame as a confident mathematics student and the boys expected her to act with deference as a girl in a mathematics classroom. Brianna developed into a “bossy girl” (kind) whereas her boy counterpart, Kofi, would act similarly in the group yet he was perceived as a “smart student.”

Summary

In this chapter, I first presented how the construct of status is used and theorized within the program of research called Expectation States Theory. This is important because CI was originally informed by that program of research. Furthermore, this study is concerned with CI, generally, and how the idea of *status*, specifically, was used by prospective teachers learning to implement CI. Next, I presented the theoretical framework that guides this study. Overall, the theoretical framework explains how *kinds* of students are constructed. As I will reveal in later chapters, the concept of *status* has contributed to *kinds* (Hacking, 1986, 2007) of students, for example “low status students.” The theoretical framework explains the production of *kinds* from two directions. From one direction, power/knowledge discourses (Foucault, 1980) create the possibilities for *kinds* to come into existence through institutions such as sociology and CI. From a second direction, interaction rituals (Goffman, 1967), partially informed by power/knowledge discourses, recreate *kinds* as interactants draw on *kinds* to make themselves and their actions interpretable by others. I related *kinds* of people during interactions to Expectation States Theory and *status beliefs* (Ridgeway, 2019) to highlight the similarity; *kinds* may be implicitly referenced during interaction rituals in the way that third-order *status beliefs* are similarly

referenced during group interactions. In the next chapter, I discuss the methods and methodology that guided the analysis for this study.

METHODS

Human *kinds* (Hacking, 1986, 2007), or categories of people (Bowker & Star, 2000), are constructed through discourses, as explained in the theoretical framework. Foucault's notion of discourse is not limited to speech and linguistics; rather, discourse is both language and practice. Discourse includes all the semiotic signs (i.e., gestures, configuration of space) that shape the meaning we make of our experiences in the world. Speech and language are only one of many aspects of discourse that mediates our ways of talking about the world or our experiences in order to make sense of the world or our experiences (Johnstone, 2018; Jørgensen & Phillips, 2002). This view of discourse aligns with social constructionist view of language and discourse which posits that reality is not "out there," but that reality is constructed through language and discourse. As Jørgensen and Phillips (2002) put it, "with language, we create representations of reality that are never mere reflections of a pre-existing reality but contribute to constructing reality." This relates to Foucault's notion of *discourses*, or the "conventional ways of talking that both create and are created by conventional ways of thinking" (Johnstone, 2018, p. 1.1.1). This qualitative study draws on critical narrative analysis (CNA) (Souto-Manning, 2006, 2014) to understand the production of discourses related to status. I chose CNA because it is closely related to my theoretical framework which concerns how discourses construct *kinds* of students (Hacking, 1986, 2007). In this study, I analyzed the narratives, or stories, that prospective teachers told regarding students working in small groups. I found these theories of discourse to aid in my interpretations of the teachers' stories and how they contributed to the construction of certain kinds of students as sensible.

Methodological Considerations from Critical Narrative Analysis

CNA (Souto-Manning, 2006, 2014) supplements the ideas of critical discourse analysis (CDA) as discussed by Fairclough (2013). As Souto-Manning (2014) explains: “CNA proposes that when individuals make sense of their experiences through narratives, they bring together the micro (personal) and the macro (social or institution) situations in place” (p. 163). The micro- and the macro-situations are important elements of Fairclough’s version of CDA. Generally, theorists of CDA are interested in how language and text propagate ways of thinking about the world. This is similar to Foucault’s theory of discourse in that discourses make available ways of thinking about the world; however, Foucault would not limit discourse to only language and text. For Fairclough (2013), CDA as a method, is limited to concrete semiotic systems such as text and images. Although Fairclough recognizes the multiple definitions, grain-sizes, and omnipresence of discourse, in his version of CDA he names them differently for analytic purposes. Fairclough is most interested in how language and text is linked to social practices. For instance, how realities that are made up in teachers’ conversations about groupwork are related to other texts. Fairclough argues that every instance of language use resides in three dimensions. The first dimension (the micro/personal) are concrete texts that are produced. In this study, the texts are represented as transcripts and encompass the artifact that is available for analysis. The second dimension is the discursive practice – that is, how the text was produced. In the case of this study, the text is produced in conversations that occurred among preservice teachers’ learning about teaching mathematics using CI. The third dimension, the macro dimension as described by Souto-Manning (2014), is the social practice. The social practice encompasses the wider set of social practices, or cultural practices, that the production of the text resides in. In the case of this study, the wider social practices that surround the production of text include the

course in which the teachers were students— a teacher preparation course with a focus on reformed standards based-mathematics instruction and the use of groupwork, a la CI (Cohen & Lotan, 2014). Fairclough's version of CDA is concerned with how the macro dimension of discourse, or larger social practices, are drawn on to produce texts in the micro dimension. Jørgensen and Phillips (2002) state it this way:

The relationship between texts and social practice is mediated by discursive practice. Hence it is only through discursive practice – whereby people use language to produce and consume texts – that texts shape and are shaped by social practice. At the same time, the text (the formal linguistic features) influences both the production and the consumption process (p. 69).

This makes CDA, as an element of CNA, a useful methodology to understand how the social practices of mathematics education writ large, and with particular regard to CI, were utilized by preservice teachers to make sense of groupwork in their students teaching placements.

At a first glance it may seem contradictory to pair Foucault's notion of discourse with Fairclough's notion of discourse as it is used in CDA. Fairclough's three dimensions may seem to imply a hierarchy to discourse, which would not be consonant with Foucault's encompassing notion of discourse. To be clear, Fairclough does not argue the dimensions are hierarchical but rather aspects of discourse which should each be analyzed because of the potential to surface aspects of how discourses work. Fairclough's theoretical notions of discourse do not necessarily disagree with that of Foucault; however, Fairclough provides a methodology to study the artifacts of power/knowledge discourse (Foucault, 1980) as they appear in text. The utility of CDA, in part, in guiding the methodology of this study is that CDA helps to identify the exact element of discourse that is the object of this study—that is the transcripts of prospective

teachers' storytelling about groupwork. Additionally, CDA has a sharp focus on power which is informative to considering how ideas from CI may be made powerful.

Methodologically, I have limited the range of discourse as the object of the study. For example, I do not analyze the simultaneous discourse that includes the sharing of videos among prospective teachers, their physical arrangement in groups and use of gestures of the narrative event (Juzwik, 2011). In this study, I use discourse in a Foucauldian sense to mean the system of ideas that are available to inform our thinking; practically, I studied the transcripts of prospective teachers' oral storytelling to see which ideas-and human kinds-appeared in the prospective teachers' stories.

Souto-Manning (2014) builds upon CDA to inform the methodology of CNA. For Souto-Manning, "narrative analysis focuses on how people make sense of their experiences in society through language" (p. 161). In this study, I am concerned with how the prospective teachers make sense of their experiences implementing groupwork during student teaching. The prospective teachers used language and ideas from CI as they shared and told stories about their implementation of groupwork. The critical aspect of CNA seeks to highlight the role that power/knowledge discourses play as they make sense of their experiences. As Souto-Manning (2014) states:

CNA allows us to assert the power of institutional discourses through the analysis of conversational narratives and to verify the presence of recycled institutional discourses intertextually woven into their fabric... CNA allows for the critical analysis of narratives in the lifeworld – the everyday stories people tell – within the context of institutional discourses (p. 163).

In the context of this study, CNA allowed me to understand how the institutional discourses of CI shaped the stories that the preservice teachers told about their implementation of groupwork.

In Foucauldian terms, the “institutional discourses” are the power/knowledge discourses which are formed through the processes of positivity, epistemologization, scientificity, and formalization in the social sciences (see theoretical framework for further explanation). Sometimes these processes, as Hacking (1986, 2007) would state, *make up people*. Particular to this study is the ways in which the discourses from CI are used by the prospective teachers to make sense of their experience. Others might say the converse— that this study concerns the ways in which the teachers were used by the discourses to make sense of their experience since the discourses are all there is to use to do so. As Bakhtin (1981) put it:

Language is not a neutral medium that passes freely and easily into the private property of the speaker's intentions; it is populated — overpopulated—with the intentions of others. Expropriating it, forcing it to submit to one's own intentions and accents, is a difficult and complicated process (p. 294).

Bakhtin highlights that we use language that is available within the discourse. CI can be considered an authoritative discourse, legitimized by the institution of sociology and the teacher preparation program. The CI discourse has classified *kinds* of students: low- and high-status students. The power/knowledge discourse of CI provides a unitary language propelled to force a single account of groupwork. To Bakhtin (1981):

The authoritative word demands that we acknowledge it, that we make it our own; it binds us, quite independent of any power it might have to persuade us internally; we encounter it with its authority already fused to it ... Its authority was already *acknowledged* [emphasis original] in the past. It is a *prior* [emphasis original] discourse. It is therefore not a question of choosing it from among other possible discourses that are its equal (p. 342).

To bring these ideas together, CNA as a methodology allows the researcher to look at the production of a text, in this case small stories (Bamberg, 2006), to understand how those small

stories are influenced by various discourses. This allowed me to consider the ways that CI may operate as a power/knowledge discourse influencing teachers' sense making and interpretations as told through stories of their experience. As such, CNA as a guiding methodology aided in "demystifying the social construction of reality" (Souto-Manning, 2014, p. 163) where low-status and high-status are *kinds* of students that are common and expected in mathematics classrooms.

Data Generation

The data for this study were generated from a mathematics methods teaching course in Spring 2019. The students were prospective secondary mathematics teachers learning to implement CI (Cohen & Lotan, 2014; Featherstone et al., 2011; Horn, 2012) as an element of the course. The ideas of CI were not new to these students. This cohort of students had been introduced to the ideas from CI no later than their initial mathematics methods teaching course that was two courses prior to the current course and they continued to engage with the ideas from CI through the subsequent mathematics methods teaching courses. As such, the site for this study was a unique setting to study prospective teachers' stories about groupwork and can be thought of as a "best case" scenario since the prospective teachers have had several opportunities—over 12 months—to learn about and engage with the ideas of CI. Prior experiences related to CI included reading *Strength in Numbers* (Horn, 2012), reading parts of *Smarter Together!* (Featherstone et al., 2011), experiencing aspects of CI themselves (e.g., doing groupworthy tasks with assigned roles) designing groupworthy tasks, writing multiple ability treatments, and video analysis of small groupwork. Additionally, this cohort of prospective secondary mathematics teachers (PSMTs) provided a unique case because at the timing that data generation occurred, the PSMTs had been involved in their student teaching classrooms for over one-semester. The

PSMTs had previous interactions and experiences with their students as well as had developed relationships with the students they teach; as such, the PSMTs had multiple resources and personal histories in relation to their students to aid in making sense of status hierarchies. I reasoned that such experiences were different from the resources that might be brought to bear, for instance, in a video club that watched video with students that the PSMT did not personally know.

In this study, the PSMT were asked to engage in two cycles of what we called a Groupwork Lesson Inquiry (GLI; see Appendix A). An important aspect of the GLIs was that I asked the PSMT to identify a focal student to anchor the design of a groupworthy task and the focus of their observations and reflections. Focal students (Dudley, 2013) create opportunities for teachers to think about the design of a lesson or task through the focal students' experience and can be a way to help teachers build a task based on a particular student's strengths. In turn, teachers may then be more likely to *assign competence* (Cohen & Lotan, 1997a) to the focal students. To select a focal student, the PSMTs chose a student that they perceived to be positioned as low status among their peers. In the first GLI, the PSMT designed (or adapted) and implemented a groupworthy task in their student teaching field placement. After doing so, I asked the PSMT to reflect on their implementation and experience in a structured way (more fully described below). The knowledge and experience of the first GLI—including their focal students' strengths—was meant to inform the second iteration of the GLI assignment.

The PSMT recorded their implementation of each task associated with the GLIs. The video recordings that PSMT captured centered the group that contained their focal student. To structure the PSMT reflections, I asked the PSMT to write a reflection about their experiences and observations with implementing the task. This reflection served two purposes. First, I wanted

the PSMT to record salient moments before watching the video. Secondly, I wanted the PSMT to reflect generally on the nature of groupwork (i.e., the class as a whole) as well as the dynamics of the focal student's group. Before the PSMT returned to the subsequent class meeting, they identified a 3–5-minute video clip that contained evidence of a status hierarchy. At the class meeting, the PSMT transcribed the pre-selected video clip and then shared, in small groups, their observations and evidence of a status hierarchy. I audio recorded and transcribed the small group conversations among PSMTs which are the primary data source used for this analysis.

In later sections and chapters, I present portions of small stories that appeared in the transcripts of the small group conversation (small stories is explained in the next section). The excerpts are labeled using codes that reference the small story. For example, S07.1 and S07.2 indicate the first and second small story, respectively, told by the same prospective teacher. The same idea for S11.1 and S11.2. I do not provide pseudonyms for each of the other prospective teachers to focus my thinking and analysis of the small stories—rather than the prospective teacher telling the story. I find this productive for my thinking so that I can continue to think about how the prospective teachers and stories may be *used by* the power/knowledge discourses (in a Bakhtinian sense) to create a stable reality of classroom life.

Analysis

To analyze these data, I first identified episodes of *small stories* (Bamberg & Georgakopoulou, 2008; Georgakopoulou, 2007) within the transcripts of PSMT sharing their implementation of the groupworthy task for the GLI. A small story consisted of a segment of text with two temporally linked events. These small stories are the narrative micro/personal texts that are analyzed in the tradition of CDA. It is in these small stores that the third dimension of Fairclough's discourse, the macro discourse, may appear. I used a loose definition of small

stories, rather than the Labovian formal elements (i.e., abstract, orientation, complicating action, evaluation, resolution, coda) of a story so that I was able to capture the stories that were “short, fleeting in nature, and interactionally contingent” (Ives & Juzwik, 2015, p. 77). The small stories did not always contain all of the Labovian formal elements, but included important tellings about past and/or future events relevant to the status events the PSMT discussed.

I identified two types of *small stories*. Each small group discussion began with a PSMT telling an initial *small story* about the small group video they collected as part of the GWLI. To identify where the initial small story ended and subsequent small stories began, I attended to what Goffman (1974) called *framing keys*. Framing keys are changes in the communication behaviors (i.e., extended pauses, change in tone or syntax, change in body posture) that signal a new “scene.” These initial small stories had clearly marked beginnings, because each teacher stated it is their turn to process and reflect out-loud on their implementation (or another speaker indicated they were finished which cued another teacher to begin). These initial stories frequently began with the teacher recalling the events and describing the interactions between the students. The initial small stories also had a marked ending in which the PSMT indicated they were done telling the story and were ready to move the discussion along (i.e., S10.1: “And that’s basically the whole thing; S11.1: “And, but um, this is kind of like how the whole interaction is). Another characteristic of the initial small stories is that each initial small story has predominantly one PSMT speaking. Following the initial small story provided by each PSMT, I identified *secondary small stories*. The *secondary small stories* were more interactionally contingent than the initial small stories because the group of PSMT sought to make sense of and support one another to make interpretations of the *initial small story*. See Appendix B for an example of one teacher reflecting on the implementation of the group task; the transcript in Appendix B

identifies the *initial small* story and set of *secondary small stories*. I chose to include this transcript in full because it is fairly representative of the nature of the prospective teachers' interaction patterns during the initial small stories and secondary small stories.

Phase 1: Initial Small Stories

Following the identification of the small stories as the unit of analysis, I then started to analyze the *framing* (Goffman, 1974) of the initial small stories. As I read each initial small story, I was guided by Goffman's (1974) key question in *Frame Analysis*, "What is it that's going on here?" (p. 8). At first, I paid close attention to characters that appeared in the story. As Hand et al. (2012) explain:

a frame defines the meaning of a situation for participants interacting within it; it renders a context meaningful such that individuals can give a response to the question: 'What is it that is going on here?' (Goffman, 1974). One can think of a frame as a well-known scene... Frames both define the activity within the scene and help guide it further" (p. 252).

Further they state: "Frames, then, imply certain kinds of actors, relations among actors... and rights and responsibilities of particular actors (which include relations defined in terms of relative authority), and rights and responsibilities of particular actors" (p. 254). Framing, Goffman (1974) argues, is a method that individuals use in interactions to make the telling of a story comprehensible to others. Frame analysis afforded the potential to reveal what *kinds* (Hacking, 1999) of characters are sensible, ordinary, and expected in mathematics classrooms, generally, and within small groups, specifically.

Table 2: Phases of Data Analysis

Phase	Primary Data	Major analytic activities
Phase 1	Initial Small Stories	· Identify characters · Identify prognostic and diagnostic frames · Tag stories with student descriptions of confidence, personality, status-type, etc. · Write analytic memos
Phase 2	Secondary Small Stories	· Identify characters · Write analytic memos regarding confirming and disconfirming evidence of original interpretations
Phase 3	Focal student descriptions themes	· Record student attributes and compare to stories

As I read, I asked myself: Who are the characters that seem sensible in this small story (i.e., what characters are merely labeled as a sufficient category to describe the student?) What are the characters that are elaborated on? What about these characters is elaborated? I listed the characters in the initial small story and the set of descriptors used for each character—that is each student. As I read and noted the characters, or actors, in each of the small stories, I was sensitive to the *kinds* of students that were being recreated through the story. The *initial small stories* provided insight into the type of frames employed in order to render a story interpretable to the PSMT’s peers. After reading each story and noting the characters, I wrote a brief summary of each story. I used the prompt: “This small story is about...” For example, I wrote:

Initial small story 1.1: This small story is about the way a focal student, H-Student, was doing the task by measuring in centimeters. The other group members did not want the measurement in centimeters but in inches. This created tension between the two students H-Student and D-Student. The prospective teacher attributed the status hierarchy to cultural differences because H-Student is from Palestine.

Initial small story 7.1: This small story is about a focal student that the teacher interprets as disengaged and maybe not caring about school but the teacher knows the student is smart because the student “catches onto the inquiry mathematics.” The teacher attributes this to a kind of senioritis which becomes a kind of student an “I’m not going to do anything student.” The teacher discusses motivating the student by changing the grouping.

As I read through the small stories, I noticed that the term status was frequently used as an adjective in varying forms to describe students. These descriptors included, low-status student, high-status student, high math-status student. In addition, the term status was frequently used as a noun to demarcate a type of status, such as *math* or *academic status* and *social status* (For example, S07: “Then there was like two high math, social status students at the table.”). I decided to re-read the initial small stories with particular attention toward the way status appeared as a *kind* of student along with the type of status that was attributed to the student. As I read each initial small story, I noted how the students, as characters, were positioned as *having* a certain level of general status, academic status, and social status. This helped me to focus on the way that *status* as a concept itself was framed among the PSMTs. I classified these initial stories into overlapping (not mutually exclusive) cases regarding the focal student as being or having “academic status” or “math status” and whether each of these were “low” or “high.” In addition to making these classifications in the NVivo coding system, I recorded the classification of the story in the table that included the brief summaries described above.

I then read again each *initial small story* to classify the small story as either diagnostic, prognostic, or other. Diagnostic frames function to “focus blame or responsibility,” that is they identify “the source(s) of causality, blame, and/or culpable agents” (Benford & Snow, 2000, p. 616). Prognostic frames “involves the articulation of a proposed solution to the problem, or at

least a plan of attack, and the strategies for carrying out the plan” (Benford & Snow, 2000, p. 616). Diagnostic and prognostic frames are not mutually exclusive. In fact, in relation to social movements, Benford and Snow (2000) argue these are core framing tasks. To prompt the prospective teachers’ storytelling, I asked on the assignment sheet: “How is status illustrated in this episode? What are the implications for your focus student on their opportunities for learning?” (see Appendix A). In class, I asked the prospective teachers, “Why is status operating in this way, with this group?” Although all storytelling and statements may not include prognostic or diagnostic frames, the way I posed the questions to the prospective teachers was likely to encourage the prospective teachers to identify the source of status problems and possible remedies. I employed these frames in this analysis, in relation to CI, because they provided insight into how PSMT framed status as a problem within small groupwork (i.e., the environment) or a problem with a student. In a table, I wrote brief notes to indicate to what diagnostic framing and/or prognostic framing was used in the initial small story. Table 3 provides examples of these notes.

The PSMT in this study were specifically asked to identify the ways they saw status play out with their focal student’s small group as well as hypothesize the reasons their chosen focal student has been positioned as having low status among their peers. Specifically attending to the diagnostic and prognostic frames helped to illuminate to what extent the PSMT’s reasoning was aligned with the theory behind CI.

Table 3: Examples of Brief Analytic Notes Identifying Diagnostic and Prognostic Framing

Initial Small Story	Examples of Diagnostic and/or Prognostic Framing Notes
S03.1	Diagnostic: The focal student positioned herself as low status with self-deprecating language – “Started off by saying, ‘I’m bad at this.’” Prognostic: Developing protocols for sharing.
S06.2	Diagnostic: The main factors in this case seem to be the focal student does not feel smart in this new group of students, the students are not kind to him, or that he is not comfortable with them. This seems to be about the “right mix” of students because the teacher shares that last semester he was in a different class and was a “leader.” The teacher attributes this to some type of social factor playing out as well as the student’s personality as “more reserved.” Prognostic: none identified.

Over the course of these multiple readings, I noticed common ways that students were described. For example, while noting the characters within the story (i.e., jock, jokester), I noticed that these descriptions were accompanied by excerpts about students’ confidence, personality, ability, and prior achievement. I tagged stories with these themes so that I could later analyze each set of stories with similar tags.

Phase 2: Secondary Small Stories

The next stage of analysis began with reading of the *secondary small stories*. As I read the secondary small stories, I attended to the ways the characters and their traits that I recorded in the first stage were elaborated (if at all), made more complex, or taken for granted among the group of teachers. Once the *initial small story* was completed, the discussion included more interactions among the PSMT in which they questioned one another, provided further details about students, and at times made specific recommendations to ameliorate the problem of status

hierarchies. As I read through the secondary small stories, I sought confirming and disconfirming evidence for my characterization of the initial small story.

Phase 3: Focal Students

In the last stage of analysis, I reviewed each of the prospective teacher's description of their focal student. As a reminder, before engaging in the GLI assignment, the prospective teachers were asked to identify a focal student that they perceived to be positioned as low status among their peers. I read these last as an additional way to seek confirming and disconfirming evidence as to how the prospective teachers described and classified their students. From these focal student descriptions, I made notes about how the focal student was similarly described in the initial small story. At times, I added details about the student that were included in the focal student description, but not in the story. These notes were recorded on the original table that listed the student descriptors and summary of the initial small stories during phase 1. The focal student descriptions largely supported the themes that emerged from the first two phases of analysis.

Lastly, I read the initial small stories in sets, regarding the tags and themes I identified in Phase 1 and 2 of these. With each reading, I referred to my memos and notes to write the findings that are presented in the next chapter.

Researcher Positionality

I bring to this research my own experiences as a classroom teacher. As a middle school mathematics teacher, I challenged myself to implement equitable groupwork. I taught in a racially and linguistically diverse school and used aspects of CI in my own classroom. I continually struggled to implement groupwork and never felt that I got it "right." These experiences undoubtedly shape my perspectives on teaching and learning, as well as the research

process. As a researcher, I honored the prospective teachers' knowledge and experiences with their students, because I remember relying heavily on my knowledge and experiences with my own students to reason and explain how instructional methods I was directed to use as a middle school teacher "worked," or not. I brought these experiences and perspectives to this study and shared them with the study participants. It is worth making explicit that I was the instructor of the course for which the prospective teachers completed the activities and assignments used as data for this study. This matters to the research process because I shared stories of my teaching experiences using CI (including video of my students) and how I made sense of events that occurred in my classroom. These things likely influenced the ways the prospective teachers responded to the activities and assignments. Also, I identify as White and middle-class; these identities were shared by many of the prospective teachers, and in this way, I shared many cultural perspectives with the prospective teachers. Of particular importance to this study are the norms of whiteness (Bonilla-Silva, 2014; Frankenberg, 1993) which push for individualist notions to explain racial inequities. Individualist interpretations are inconsistent with sociological explanations that CI is grounded in. Throughout my interactions with the prospective teachers and during the data analysis I have needed to reflect on my positionality in this regard to analyze the data. I also identify as a gay queer-man; these parts of my identity are salient in my experiences and memories of schooling. In this regard, I bring a different perspective to try and make sense of the ways students participate in mathematics classrooms.

Further, my educational commitments toward supporting mathematics teachers to imagine different ways of structuring learning environments to make them more equitable than their current practices, particularly for marginalized students, influenced the way I read and interpret the data I have collected. I started the data analysis for this project as I was working

with a network of lesson study practitioners who had chosen the notion of mathematical agency as a theme. For this group, activating mathematical agency was *the* pathway toward creating more equitable mathematics classrooms. Throughout several months, I was consistently struck by conversations in which students were described as “having agency” or “not having agency;” students that were said to “not have agency” were consistently students categorized as Emergent bilingual and identified as Latin@. I continually encouraged the group to consider the ways in all students had agency and the environment was influencing who could exercise the agentic behaviors valued by the teachers. I was an agitator within these conversations with an awareness in the ways in which grit (Kirchgasler, 2018) and growth mindset (Edwards et al., 2016; Sun, 2018) had become tools to separate and classify *kinds* of students and grounded in the discourses of individualism perpetuated by whiteness. This experience heightened my awareness of the discourses within CI about low-status and high-status students; and I wondered how these discourses might be undermining the potential for CI to create more equitable learning environments.

STUDENT CHARACTERISTICS

In this chapter, I present the first of two sets of findings. This first set of findings is related to how student characteristics were used in the small stories (hereafter, stories). The second set of findings, presented in the next chapter, is related to how students' mathematical histories were used in the stories. My analysis revealed that the prospective teachers shared a set of frames to make sense of the status hierarchies they observed in their student teaching placements. Twenty-one of the 22 stories employed diagnostic frames, that is the PST developed ideas about status by hypothesizing the cause of the status hierarchy as located within the students as opposed to the environment. As Benford and Snow (2000) state, diagnostic frames "focus blame or responsibility." In one story I did not identify a diagnostic frame; in this case the teacher observed a status hierarchy that was different from their expectations and had trouble describing and telling the other PST about the observation. This PST stated: "I don't know it's weird status. What do you guys think? I haven't really figured it out." Overall, in these two sets of findings, I argue that teachers used the concept of status, in coordination with students' characteristics and mathematical histories, to reason about the formation of status hierarchies.

Specific to this chapter, I present how student characteristics were made relevant to status. This occurred in 19 of the 22 stories. Below, I present the three most common ways students' characteristics aided to frame the stories and interpretation of status: student archetypes, ascribing levels of confidence, and personalities.

Archetypes

The archetypal students that were described within the small stories included labeling types of students such as seniors, jokester, jock, football player, and class clown. Additionally, kinds of students were expressed in other ways. For instance, "Andy is one of the students that

usually just kinda sits back and doesn't wanna do anything," (S01.1) and "he gives off the heir that he doesn't care" (S08.2). These archetypes functioned in the stories to set the scene in order to make sense of the interactions that were soon to be shared. In all instances, the characters are taken for granted and the implications for these archetypes of students seem to be understood by the teachers since the narrating teachers were not asked to elaborate or more fully explain the meaning of this *kind* of student. In some instances, the prospective teachers' peers added to the meaning of certain *kinds* of students in their mathematics classroom. For instance, S03 responded to S08's small story by stating:

Excerpt from S08.1

[In response to S08 during a secondary small story]

S03: I feel like with my students who, in the same way who want high status and pretend not to care, when they do those things they get a validation from other high status students where they are like laughing at them, not laughing at them but like they are making a joke out of it [inaudible]. [They] think it's a good time and they're creating a rise out of the classroom when they do that and I feel like that, that enforces the pattern. I don't know if that happens to him, or—

Excerpt from S11.2

[During initial small story]

S11: I should go here because my focus student is a lot like that, so I think it is a good comparison. My focus student, his name is Carson, his big thing is he gets it, he's got the ability. He is semi-high social status in his group of peers. He is a football player but, semi-high social status but that status comes from like joking around and being class clown. Um, and he is semi low math status. But, he gets it. That being said, he works individually extremely well. So like whenever we are doing like lecture, or lessons, or individual tasks, he like can be on task and understands the math and I can see the process its good. But the second we break into anything group work it's always like "I'm going to joke around with you" and ignore the task and not even have the assignment out sometimes!

Overall, archetypal student categories described students that did not engage with their peers in a way that the prospective teacher desired. In order to make sense of these students' engagement the PST used the character types to reinforce that classrooms contain certain *kinds* of students that appear in groupwork that make a natural hierarchy emerge.

These kinds of students are approached as an enduring quality or trait of the student, that represents more than the particular student but a set of *kinds* of students. Even though students may be recognized as certain kinds of students, what framing the issue of status in terms of students as characters misses, is the way the ecology/environment of the classroom necessitates the need for this "kind" of student. For instance, it doesn't allow the teachers to ask the question about why the students might be acting in these ways. It could be that these characters are portrayed as "masks" so that students are not seen as incompetent. Or it could be a way of "saving face". It could be that there is some type of social risk that the students are attempting to mitigate by playing out these characters. In any case, these interactions lead to a status hierarchy in which certain students are recognized as more/less competent and the opportunities for learning are more varied.

Confidence

The second way students' characteristics were used within the stories was by ascribing a level of confidence to students. In some cases, as demonstrated by the two quotes below, confidence was used to describe how students positioned themselves as lower within a status hierarchy.

Excerpt from S03.1

S03: So I think she, she positioned herself as a low status by starting by saying, "I'm really bad at this." [...] So just kind of making it so that those quiet students who maybe aren't so confident don't get over-spoke when they do decide to participate. I don't know.

Excerpt from S04.1

S04: It's basically just a conversation of them going back and forth, and the student with the higher academic status was not very sure with what she was doing, and just kept being like, "Oh, I don't know what I'm doing." So it kind of, she kept like positioning herself as being like lower which was really interesting, but I think because she was just confused on the task. [...] Olivia would be like "Yeah, I agree with Conner" so it was interesting that she agreed with whatever Conner said too. Um, but I also feel like she is like, like I said she isn't really confident in herself, so she'll like participate in class but she doesn't like to. If she does, she is very quiet.

In these two instances the prospective teachers related their perceptions about their students' level of confidence, in coordination with a general personality trait as quiet. What is notable in these two small stories is that in both cases the student who is perceived by the teacher to be at the lower position of a status hierarchy and the students have positioned themselves there. In these stories the attribution of blame is toward the focal student in a way that seems to blame the student, for instance when S03 stated, "she positioned herself as low status" and S04 stated, the student "kept like positioning herself as begin like lower." In these stories, the attribution of blame was not toward other students which possibly could have been perceived as too domineering. In fact, these two prospective teachers countered this alternative. The excerpt that follows is an example of how such an alternative was countered within the story.

Excerpt from S03.1, continued from above

S03: They weren't trying to say like what you have to say isn't valuable. Um, so I think they, they kind of tried to help her through it and positioned her as someone who's capable even if she feels like she's bad at it, which was good to see. But then there was definitely the one student who is like the over-talker who just wanted to get it done and say, "Okay, so a pro for this would be this," and connected all the dots. Um, so I think sometimes, Gabby, I think sometimes people over– over-spoke Gabby when she had something to say, but probably because they're trying to help her because she said she was bad at it. [...] So, it's kind of like... It's great that they were helpful, but not so great... Um ... So I think for students like that, that, that might get over-spoken, or people will speak over them, it might be better to have a participation structure like one ... kind of like we do.

In this part of the story, S03 also attributed blame to the participation structure which did not create a way for Gabby to share which would diminish the possibility of getting over spoken by her peers. The reason that Gabby was over spoken in this story is because Gabby positioned herself as needing help, and therefore it seemed reasonable that the other students would act in the ways identified (talk over Gabby). In this sense, if Gabby had not said “I’m really bad at this,” the status hierarchy that was observed by S03 might have been different. Similarly, S04 countered alternatives to confidence in the following way:

Excerpt from S04.1, continued from above

S04: So the way I saw status play the most was the other boy, his name is Conner, he is very like— He has higher academic status and higher social status. He is very—he’s like confident and sure of himself. Not in like a cocky way but he is just like um, I don’t know how to explain it. He is always willing to volunteer. He knows that he knows what is happening. [...] And I don’t necessarily think that Conner was intentional about ignoring Alex, my focus student, but I feel like he is like very I don’t know. He [Conner] and Olivia would talk to each other, and they would try to work through the problem and he would sometimes like direct

questions toward Alex, but Alex was also so quiet and [inaudible]. There were a few times when Alex did offer something and Conner would be like, “no”. And then like give his reason for why he was wrong. But sometimes Alex did give a valid thing. So that was where I saw status play a role. But then Conner would come back and be like “oh no you were right” so they would talk about it. It wasn’t so much like I’m saying no because of your status. I feel like he just actually disagreed.

In this part of the story, S04 attributed confidence levels to the students that are perceived as higher and lower in a status hierarchy. The teacher reasons that the student ascribed with high confidence (Conner) was not intentionally ignoring the student ascribed to have less confidence (Alex) out of malice, but that Conner disagreed simply because he is confident in his own abilities. Further in this story Conner is interpreted that he was not “saying no because of your [Alex’s] status. I feel like he just actually disagreed.” Status when framed in this way does not clearly align with the status organizing processes as described by Expectation States Theory. In this story, the status hierarchy emerged out of students’ confidence levels without regard to how students perceived one another’s confidence or competence. According to Expectation States Theory, however, status does not emerge out of one’s perceptions of one’s own confidence or competence. Status arises out of how the individuals’ *think* they will be expected to contribute by others—that is the confidence and competence that others’ will ascribe to them. In accordance with the theory, Alex does not have to feel unconfident, he must only *think* that others presume he is not confident, and as such, will act accordingly. In framing status with regard to one’s own feeling of competence ignores the expectations that group members bring to their work in small groups. In addition, this vignette highlights how teachers tend to identify with certain student for various reasons, such as Conner’s extroverted nature and being “always willing to share,” which may also play a role in contributing to how status hierarchies form.

When Conner acting confident is given as the reason to disregard Alex's contribution to the group, it dismisses the element of expectations. One may also ask: Why might Conner have dismissed Alex's contribution? One reason may be that he feels confident relative to Alex. But also, through prior histories of students interacting in classrooms together, Conner may perceive Alex to be less competent and/or confident. This perception may have contributed to the possibility of readily ignoring Alex. If Conner had been placed with a student that Conner perceived to be competent and/or confident, might Conner have entertained the same suggestion? Although confidence certainly contributes to the emergence of status hierarchies, it is not students' confidence itself that is the source of status. It is in the attributions of confidence and competence that students assign to one another that create interactions in which status hierarchies emerge.

When confidence was used to describe students, at other times, it was in relation to their mathematics achievement. For instance, story S09.1 started with: "All of them are doing really well with the class. Mathematically they're all pretty high confidence levels. Um, the girl has extremely high social status." Similarly, story S10.1 began with:

So I did the group of three. Um, I call them K, B, and E. So, um, she's high math confidence, they're both low math confidence, but he has a, um, somewhat high social status. But he has a, um, somewhat high social status. She has a pretty good source of status too. He has not a good source of status at all.

In these stories, status issues were framed as an issue of students' characteristics in relation to confidence. As S10 alluded, student confidence levels provide "source[s] of status" to students. These sources of status, which appear to be a characteristic, or internal to the student, create the problem of status. Framing the problem of status in this way naturalizes the existence of status hierarchies in that they may seem inevitable. Further, these framing were prognostic in the way

they related to the prospective teachers' desire to determine the right mix of students to mitigate status hierarchies. In the following exchange after story S09.1, the group of prospective teachers wondered about the possibility of adapting the task to foster more engagement from the students perceived to be positioned low in the status hierarchy. In response, S05 stated:

My struggle with these tasks is like, sure we can make it groupworthy and make them talk to— or do these things that have interdependence, but we also can't change the student. Like if the student doesn't like to talk to other students, I'm not going to change that.

There was general agreement among the prospective teachers about the truth of this sentiment. What this framing of the story highlights, and teachers' responses to possible prognostic framings, is that the issue of status is overall framed as a trait of the student. In the excerpts in this section, I have demonstrated how this trait was discussed in terms of confidence and supported by discussing students' willingness to engage with others. As teachers wondered about the use of different groups of students, this affirmed that they contended with a conceptualization of status as emanating from the students (i.e., "source of status," "We also can't change the student"). If status issues arise from the students themselves, then there is a need to find the right mix of students to fix problems of status or acknowledge that nothing can be done. Yet, teachers also diagnosed the issue partly in terms of task design, which opened up the space to reason about the environment and ecology that makes certain types of interactions more plausible. In framing the issue of status by coordinating confidence with the composition of groups, the prospective teachers also discussed student's personalities, which I turn to next.

Personalities

The framing of status as related to students' confidence levels and determining the right mix of students for groupwork to function well, was also supported by framing the stories by

discussing students' personalities. Eleven of the small stories used descriptions of students' personalities. Personalities were used similarly as archetypal students, but personalities described a student's disposition to act in a certain manner (as opposed to a general *kind* of student). Archetypes and personalities, though, are not mutually exclusive. Examples of the prospective teachers framing the small stories with regard to personalities included describing students as outgoing (or not), bossy, quiet, awkward, shy, reserved, and self-conscious. These descriptions were also associated with further descriptions of students having low or high social status and/or low or high mathematical status. I discuss the ascription of low status and high status in the conclusion. At this point, I'll elaborate on how descriptions of students' personalities framed the problem of status.

Overall, the diagnostic framing associated with the descriptions of students' personalities served to situate the issue of status as a teaching problem in which the teacher must find the right mix of students that can work well together. For instance, consider the following story, S05.2:

Excerpt from S05.2

S05: So, I... My focus student has really really high math status. He is really super smart has like over 100% in the class but he doesn't talk. He doesn't like to participate that much.

S10: I have a student that is just like that.

S05: Um, so that's why I picked him. He doesn't interact with anybody in the class really. He just sits and does his work and is really quiet.

S02: Maybe he thinks they are stupid.

S05: No, not because of that. He's actually expressed to me before that he actually likes to be with his friends and when he is with his friends, he's like more social, but he doesn't have any friends in that class.

S10: Ohhh [*Collective with S02*]

S05: He's kind of just a shy student, really smart. So um, I wanted his ideas to be expressed because he's got some really good ideas.

S10: Okay

S05: So I placed him in a group with another student who is like really high status socially and he is really high status mathematically also

S10: Okay, so that's a good.

S05: So similar math but opposite levels. Actually, all four of them had pretty high math status. They were all around the same level. But the social status varied. Two of them were high social status and two of them were not high social status.

S10: I want to see how that works out.

S05: So what ended up happening is, I made it - his name is Emmett, my focus student. I made him be "student A" because "student A" had to start, I planned that on purpose. He didn't know, so right away where it started to happen he goes: "Okay, this is what I got" and he starts to explain it, what his graph should look like, and this other student Donovan, he's the one that has really high social status.

S10: His name is Donovan? I have a student named Donovan too.

S05: Yes. He talks all the time.

S10: Mine doesn't.

S05: So, my student started to talk and explain what it should look like, that was it, and all of a sudden Donovan took over and was like, "well I got--". And I was like: "You guys, we gotta stop. We've got to find his matching graph first and then you can continue. So right away he wanted to get his point in. Um, and then they-- I was walking them through this whole process, what graph do you think he has. And the problem was he had age and hair length and he assumed it would be linear.

S10: I mean, so that's how I actually thought--

S05: Yea. So then I had to jump in and be like, "if someone is 30, does that automatically mean they have long hair? Cuz they are older than someone is 20? They were like, "no". So I was like: "What do you think a scatter plot would look like for age and hair length? We don't know... And that was when Emmett was like, "well what about haircuts?" They were like, "yea, with haircuts we don't know." But this whole transcript was me talking to the whole group, but Donovan

would always respond, even though we were talking about Emmet's graph specifically. The only time I would get Emmet to respond is if I would look at him or say his name and say, what are you thinking? There were actually a couple of times he started to speak up and say, "the haircuts." He would say, "well what about haircuts" and he'd get interrupted.

The teacher framed this story as a type of experiment in which she was seeking to determine the right mix of students. In this particular case, the teacher reasoned about the focal student's personality (shy, quiet) along with his "social status" and "math status." The group was composed of students with similar "math status" and with varying degrees of "social status." The prospective teacher learns that, in accordance with the prediction of Expectation States Theory, the students with "high social status" had more influence in the groupwork and the idea from the focal student was dismissed until the teacher intervened. In framing the story by attending to the students' personalities and levels of social and math status, the issue of status is resolved by trying to compose the right mix of students which implies that status resides within the students. Alternatively, status can be conceived as the result of students' interactions. In this regard, students don't *have* status but create a status hierarchy which is observable through their interactions.

This type of framing was also prominent in story S09.2. In S09.2, the prospective teacher has organized a group of students with similar "math status," yet one student has a marked level of "high social status." The prospective teacher described how social status influenced one student to have undue influence on the group's ability to proceed through the task since and that the same student had difficulty or resistance to hearing from the other student why her idea was incorrect. The excerpt below is a portion of the introduction of S09.2:

Um, and so the reason I picked this group is because the girl is very high status, like high social status, and the three boys are kind of like way lower and when I transcribed it there... I noticed four times when my focus student went to actually say something. Like in the first go around of this he said like one thing. But there were four times when he went to go say something and the girl literally cuts him off. One of the times um he goes it just doesn't even make the— and then she goes “whoa whoa whoa whoa” and then starts talking. So, I think that right there is definitely some social status playing a role.

Later, S09 explained:

One thing that I thought was interesting in the little three-minute clip that I picked out. Since they all have higher math status, I would have thought that they would have been able to roll through this pretty quickly, but the way that they read it, the girl got confused on what it was asking. [...] But all of the guys, three of the guys were like “no” she can only make ten. And then the girl goes, we just proved it wrong because she can make... or he can make 12 in 24 hours. And they are like, “no, she doesn't have a time restriction” and they just had like this fight where they were right, but their social status is like trumping them. She is like trying to overpower them and she ended up calling me over to ask and I asked a couple of questions and eventually they figured it out but, that was just interesting that the three of them together were right, but they couldn't trump her misconception because of status playing such a role.

Once again, this story reveals how the prospective teachers approached understanding the problem of status by attending to the composition of the groups. This story is enveloped with the descriptions of the focal students' personality as being “socially awkward” during the introduction and later elaborating that the student is “not an outgoing person.” Like the story shared by S05 earlier, the discourse of “high and low math status” and “high and low social status” is also present. Moreover, the prospective teachers' observations about the formation of the status hierarchy are in accordance with the prediction of Expectation States Theory. That is, local status characteristics (i.e., popularity) get associated with competence so that individuals'

expectations of another's ability to contribute to the success of the group are reduced to popularity. As S09 stated, "their social status is like trumping them" and because of their "low social status" the other student likely did not perceive them as a mathematical authority capable of helping her resolve her misconception about the problem. As stated within the story, the student with "high social status" opted to ask the teacher for help. It is interesting that the other students' specific status characteristic related to mathematical ability, prior mathematical success, or mathematical know-how isn't included in the story. Rather than deferring to the students, which S09 recognizes as all competent—and actually have the correct interpretation of the problem—the girl defers to the teacher which is the ultimate mathematical authority in the classroom. Moreover, S09 attributed part of the problem of status to the students' personalities. Subsequent to the initial small story the focal student was reiterated as "not an outgoing person" which did not have the right personality to exert his voice over the "dominating" student in the conversation.

In another interesting story that relied on students' personalities, S07.2 discussed the focal student's personality by describing the students' history of working with students that have similar personalities. In this case, the focal student worked well with "quiet people" in previous groupwork assignments. The focal student was further described as quiet, shy, and self-conscious. Ultimately, this prospective teacher closed the storytelling as unsure about the reasons for the status hierarchy, stating: "I don't know why, other than she doesn't make friends why she is low status." Even though this prospective teacher's story did not settle on a single reason, the overall framing of the story—in which the student in one context, with peers of similar personalities was differently positioned within a status hierarchy when asked to work with other students—is partly about the need to find students that can work well together, which suggests

status as emanating from the student. Yet, S07's telling of the small story recognizes that status is dependent upon context which is important because this can disrupt notions of status as emanating from students and provides a way to shift the notion of status to a phenomenon of the group and the way students interact with one another.

Discussion

In this chapter, I explored how student characteristics were used to describe students as teachers told stories about status and groupwork. The three themes I identified in the teachers' stories were related to student archetypes, confidence, and personality. All of the teachers told stories that were related to these themes. It is not surprising that the prospective teachers would portray their students in these ways. Wortham (2006) argued that teachers draw on models, or archetypes of students, to make sense of classroom life. Wortham notes that teachers often rely on sociohistorical models of students and over time build local characterizations of students. This is to say, teachers initial impressions of students may rely on certain *kinds* (Hacking, 1986, 2007) of students; the kinds of students that these preservice teachers invoked were not far from the U.S. cultural imagination of students in secondary schools— such as jocks, class clowns, and seniors (Eckert, 1989). In describing students in these ways, the teachers were able to provide an image to their peers in which their peers could make assumptions about how such students typically behave and interact in mathematics class. This is the function of *kinds* in Goffman's (Goffman, 1967, 1974) notion of interactional routines. Culturally, we expect that the class clown will distract their peers, not take the assignment seriously, or the like. I assert that the *kinds* functioned similarly in the prospective teachers' stories since the meanings of the kinds were not followed up by their peers. There was an implicit understanding of the role *kinds* of students would have in groupwork.

Throughout the prospective teachers' stories, there seemed to be a keen awareness about the role of social status in mathematics classrooms. Related to the notion of archetypes, one such *kind* of student that appear was the "popular student" and similar themes as the prospective teachers described students' personalities. Popularity was also intertwined with how confidence was ascribed to students; popular students seemed to exhibit more confidence among their peers. Social status is an important aspect of school life which influences how students can and are expected to contribute to groupwork (Cohen & Lotan, 2014). Cohen and Lotan describe various sources of status—among them are expert (mathematics) status, general academic status, peer status, and societal status. Cohen and Lotan state that "peer status may be based on athletic competence or on attractiveness and popularity" (p. 33). Students' popularity among peers is one way that the teachers were making sense of how status hierarchies organized groupwork. The conventional wisdom from Expectation States Theory is that expert status related to the task at hand will override other attributions of competence (i.e., gender, race). This is to say if a student is known among their peers to be highly competent in mathematics, then students will defer to that student regardless of other status characteristics. In the stories told by this group of prospective teachers, the role of social status seemed to be a primary driver of the status organizing process.

The early studies of CI (e.g. Cohen & Lotan, 1997b) in which sociometric surveys were used to predict status hierarchies are primarily from elementary classrooms. The highest grade level I have seen this method employed is in a sixth-grade classroom (Bianchini, 1999). In these studies, students' popularity was combined with students' conceptions of their peers (by asking who they would like to work with in a group). In this study, the prospective teachers clearly perceived peer status and sociability to be a primary factor in groupwork processes. This is

evidence in the stories where the students the teachers described as highly competent in mathematics were not the most influential in the group. The observations by these prospective teachers highlight that status may organize differently in secondary classrooms as compared to elementary classrooms. One implication for this is related to the act of assigning competence. In secondary mathematics classrooms, it is very likely (such as seen in these stories) that students are aware of who has the highest grade—or who is recognized as the most competent (that is, who has “high mathematical status”). If such students are already recognized as mathematically competent then assigning competence does not necessarily make sense. As S02 stated about the high achieving mathematic student that was lower in the group’s status hierarchy, “Maybe he thinks they are stupid.” In such a case, an alternative intervention may be necessary. Boaler (2006) described an additional outcome of CI at Railside High School to be *relational equity*.

Boaler states:

Railside was equitable partly because they achieved more equitable outcomes on tests, with few achievement differences aligned with cultural differences, but also because they learned to act in more equitable ways in their classrooms. Students learned to appreciate the contributions of different students, from many different cultural groups and with many different characteristics and perspectives. It seemed to me that the students learned something extremely important that would serve them and others well in their future interactions in society, which is not captured in conceptions of equity that deal only with test scores or treatment in schools (p. 45).

Similarly, Vakil & McKinney de Royston (2019) state:

[Groupwork is] often justified as part of a larger goal of helping students gain conceptual understanding or improving learning in a disciplinary domain, which are undoubtedly important aims. However, this framing presents students relationships as a means, not an end unto themselves (p. 548).

As Boaler (2006) and Vakil & McKinney de Royston (2019) highlight, groupwork can be used in ways that extend beyond learning mathematics, but in learning to work with individuals across various lines of difference. Status organizing processes in many of these prospective teachers' stories seemed to operate based on popularity, sociability, or perhaps in relation to social cliques. At any rate, the prospective teachers in this study told stories in which status hierarchies emerged, but the specific status characteristic of perceived mathematics competence did not align with the high state. Mathematics classrooms, and CI, can work toward larger purposes of cultivating productive habits of living in a pluralistic and democratic society. Habits in which individuals from across cultures, creed, religion, partisan affiliation, and other means of identifying, can respect and learn from one another. For teachers to be able to develop this type of *relational equity* it might require that teachers be able to see and respond to the ways that students' interpretation of one another as *kinds* also mediates groupwork. (Bishop, 2012; Langer-Osuna, 2011). Much like the prospective teachers noted in these stories. In addition, though teachers need support to not place the blame and problem on the students, rather to focus on the group learning to work and learn from one another. As a field we may need to consider what other expectations of students need to be unsettle, beyond expectations of competence.

The findings in this chapter prompt further consideration of status beliefs, which establish expectations for group members to be able to contribute to the group. The stories demonstrated how student characteristics such as archetypes and levels of confidence were used as diagnostic frames to understand the development of status. According to Expectation States Theory, though, attribution of characteristics alone—such as shyness or confidence—are not sufficient for status organizing processes. One reason that the formation of status hierarchies are often predictable given individuals' status characteristics is because of the role of third-order beliefs. Third-order

beliefs about competence are what an individual believes that most others believe about their own competence. Expectations States Theory states that individuals act based on how they believe others will expect them to act. In this way, an individual does not have to believe any “status belief” but they will act in accordance of the belief for the good of the group. Consider when S03 recalled a student positioning herself as low status when the student stated, “I’m really bad at this,” and attributed this statement to a lack of confidence. It may be a correct interpretation that the student exhibits a lack of confidence, but that does not tell the whole story. A statement such as this is also performative in nature. With third-order beliefs at play, a student may make statements such as this because the student must perform, or act as a certain *kind* of student (unsure student, unconfident student), in accordance with the expectations of their peers. Or maybe they act that way just for attention. The student may very well know how to carry out the task at hand, but if they believe their peers expect them to need help or ask for assistance, then the students may very well act in accordance with those beliefs. Acting in accordance with those third-order beliefs allows the groupwork to run smoothly, where every student plays their part and the scene plays on without a disruption (Goffman, 1959, 1974). The scene and the script may play as expected not only for the students, but the teacher as an observer. The teacher may see that the “unconfident students” are benefiting from the interactions from their peers and learning the desired mathematical content. When expectations of how students will interact during groupwork are disrupted, students may be ostracized by their group members as in the case of Brianna (Langer-Osuna, 2011); albeit this case is more complicated because of the operating status characteristics and expectations of girls in mathematics classrooms. In the next chapter, these themes continue, but I highlight the role that students’ mathematical histories played in the prospective teachers’ stories.

MATHEMATICAL HISTORIES

The prospective teachers also framed issues of status in terms of students' mathematical histories. Mathematical histories were invoked through ideas about students' abilities and prior mathematics achievement. Thirteen of the 22 stories used students' mathematical histories. Seven of the 13 stories with reference to students' mathematical histories were coordinated with the terminology of mathematical status. In this chapter, I focus on the discourses of ability and prior achievement even though mathematical status is tightly bound to these notions. I more fully discuss the notions of mathematical status, along with social status, in the concluding chapter.

Ability

As prospective teachers shared their perceptions of status issues with their teaching peers, some teachers drew on discourses of ability. The discourse of ability primarily occurred in two different ways. First, framing the status interactions in coordination with ability created the opportunity for the prospective teachers to highlight how students' "social status" influenced the students' interactions. In these stories, the prospective teachers explained that social status was more influential in the formation of a status hierarchy because the abilities of the students were equal. Second, framing the status interactions in coordination with ability created the opportunity for the prospective teachers to highlight the relevance of students' characteristics, particularly student archetypes.

Ability and Status

This first example demonstrates how the stories used notions of ability to demonstrate the role of social status in the formation of status hierarchies:

- S11: I'm looking at this guy, um, here in the bottom right, um, and this girl. He's—
they're about the same as ability goes.
- S10: Mm-hmm (affirmative), okay.

S11: He is, I would say, higher in social status, lower in math status. So ability is about the same, but socially he's, he's kinda got the— he kind of plays up the fact that—the jock vibe sort of thing.

The above excerpt is an example of the ways that the prospective teachers' stories used the notion of ability to frame the expectations that the individual group members should each be able to contribute to their group. In framing groupwork from the perspective of ability, the prospective teachers constructed a notion of social status which was highly influential to the formation of the status hierarchy. As such, the prospective teachers described how, regardless of ability, students' "higher in social status" tended to dominate the group discussions. In addition, the archetype of jock was referenced to possibly indicate that the teacher and other students expected this type of character to act in a certain manner even though "the jock" has the same ability.

In a similar story, S09.1, ability framed the issue early on by stating: "Um, all of them are *doing really well* with the class. Mathematically they're all *pretty high confidence levels*. Um, the girl has extremely high social status." In this story, ability was referenced in the group members "doing really well," that is the teacher perceived the student as capable and noted the student was successful in the mathematics class. In both stories presented here, despite the ability of the focal student being on par with the other group members, the prospective teachers discussed the way the focal student was treated as though they were less competent (positioned as low status); this treatment was typically understood through the role of social status. The following example (from S09.1) is illustrative of how the prospective teachers explained this phenomenon:

[As the prospective teachers watch the video of groupwork from S09]

S11: She just grabs the calculator out of his hand!

S09: Yeah, so all three of the boys asked her a question, but none of them asked each other questions. None of them. And— even when they answered, or even when they asked her a question, none of the other guys tried to answer it. It was always just her. Um, so she really, you could see the dominance in social status just like taking over the whole time.

These instances, like others, were used in the stories to emphasize the role of students’ “social status” which the prospective teachers were able to see as influencing the development of status hierarchies. The teachers explained that based on their prior interactions with the focal student, the focal student possessed the ability to be successful in the task; despite this ability the focal student was differently positioned because of their social status. It is notable that the prospective teachers were aware of the influence of factors beyond students’ mathematical competence that influenced the development of status hierarchies. Expectation States Theory would predict that specific status characteristics (i.e., mathematics ability) would have a more direct influence on the formation of a status hierarchy compared to a diffuse status characteristic, such as race and gender, or in this instance *social status* (Berger & Webster, 2018). In classrooms, popularity, attractiveness, and general sentiment toward one another are additional elements that may influence status hierarchies (Bianchi & Shelly, 2020). These “local status characteristics” (Cohen et al., 1999, p. 84) influenced the formation of the status hierarchies since the specific status characteristics of “mathematics ability” were perceived to be near equal. In these instances, the teachers used their awareness about the social contexts to reason about the presence of the status hierarchies.

Ability and Student Characteristics

Framing the status interactions in coordination with ability created the opportunity for the prospective teachers to highlight the relevance of students’ characteristics and student

archetypes. In these stories, the prospective teachers noted their assessment of students' possessing the ability to be successful in the task, yet the students' characteristics influenced the formation of the status hierarchy. The following three excerpts demonstrate the various ways the prospective teachers coordinated ability with students' characteristics:

Excerpt from S05.2

S05: So, I— My focus student has really really high math status. He is really super smart has like over 100% in the class but he doesn't talk. He doesn't like to participate that much.

S10: I have a student that is just like that.

S05: Um, so that's why I picked him. He doesn't interact with anybody in the class really. He just sits and does his work and is really quiet. [...] He's kind of just a shy student, really smart. So um, I wanted his ideas to be expressed because he's got some really good ideas.

Excerpt from S06.2

S06: And the focus student that I chose for this was actually one who, very bright, and the last trimester was one of the leaders in his class. But I kind of noticed that like after this first week of the trimester he seems a lot more reserved in class.

Excerpt from S07.1

S07: Um, she's very bright and she'll get the questions like this, like and I'll ask her things and she'll just know it and then I'll be like, "You got that right," she's like, "Yeah, I'm still dumb." And, um, even though she like gets the most complicated questions she's like, will immediately dissociate her ability with it, like right on the spot, just like almost visible, she's like... Um, and then when she does assign competence to herself, it's kind of like ironic, so the one... the part that I highlighted here, um, in the script is we were doing probability and they came up with like different probabilities for dice. [...] They had to think about the complement, and she just jumped right to that and her group had a conversation about it. And so I went over there immediately. I was like, "So how did you guys

know how to do this?" and she pointed at her head and she said, "Well, we put our heads together and we're smart, smart, smart." And it was just kind of like obviously she was being sarcastic, it was just like playing, you know a game [...] She's smart enough that she doesn't just know the math, she knows the game, you know, the bigger game of what I'm trying to do whenever I talk to her.

In these three instances, the notion of ability as possessing smartness was used to create dissonance between what the prospective teachers knew based on their familiarity with the student (i.e., the students' ability to be successful in mathematics) and what the student exhibited within the group context. Students were ascribed ability in these stories in various ways (e.g., "super smart," "very bright"). In two of the excerpts above (S05.2 & S07.1) the prospective teachers attributed the problem of status, partly, to the student that was positioned as lower status. For instance, S05 stated a preference of the student: "He doesn't like to participate that much" and S07 stated, "she's like, will immediately dissociate her ability with it." In these types of statements, which occurred beyond the excerpts of the stories shared above, the issue of status placed blame on the students for having a preference to work individually or making doubtful comments about their own competence. The stories are consistent with the diagnostic frames which attributed the formation of status hierarchies, in part, to students' preferences. There is no doubt that these students' characteristics and preferences contributed to the formation of a status hierarchy; however, attributing responsibility to students solely on these bases, when not discussed in coordination with the classroom environment and other norms, leave little room for teachers to change the conditions in which students' can position themselves differently. That is, they may eclipse the potential for prognostic frames that create space to think about solutions to status issues. Furthermore, framing status hierarchies in ways that prioritize students' characteristics and dispositions ignores other relevant factors including students' perceptions of

one another. To this point, consider the following response to the framing in Excerpt A, above, the following interaction took place:

S02: Maybe he thinks they are stupid.

S05: No, not because of that. He's actually expressed to me before that he actually likes to be with his friends and when he is with his friends, he's like more social, but he doesn't have any friends in that class.

The suggestion by S02, that “maybe he thinks they are stupid,” is worthwhile to consider further from the perspective of CI and Expectation States Theory. As the theory posits, status hierarchies emerge, in part, based on each individual's perception of the other group members' ability to aid the group's efforts. In this instance, the student who “has really high math status” and “is really super smart” may be choosing to withdraw from the group because he does not see a benefit to working with the group. Such a student may reason that based on experience he is likely to be successful without his group members. In fact, this student may think that by working with this group of peers that he will be burdened and learn less than working alone and perpetuates frames which (re)inscribe school mathematics as exclusionary and as solitary endeavor (Louie, 2016, 2017b). Such framing seems to limit the potential to consider school mathematics in alternative ways, such as inclusive and multidimensional in terms of valuing students' sense-making practices and mathematical strengths. Rather than accepting the focal student's low expectations of his peers as a working hypothesis, the prospective teacher returned to the framing demonstrated earlier which suggested that in order to have group functions in desirable ways the teacher must find the right mix of students, in this case, the student needs to “be with his friends.”

In this section, I have shown how teachers used the notion of ability to frame their stories of status hierarchies forming in small groupwork. Ability functioned to show how status

hierarchies can form among students with similar ability or mathematical knowhow; ability highlighted the role of students' "social status" to influence group dynamics. Ability also functioned to show that "high mathematics status" does not necessarily result in students ranking higher in a status hierarchy; that is, some students with mathematical status have personal characteristics or preferences that influence the formation of a status hierarchy. Overall, these small stories reinforced *kinds* of students in mathematics classroom: those who are mathematically able and those who are not. I now turn to discuss the second related theme regarding students' mathematical histories, which is prior achievement.

Prior Achievement

The prospective teachers also framed status issues by drawing on their students' mathematical histories in terms of prior achievement. In contrast to ability, in which the prospective teachers explicitly mentioned ability or ascribed smartness to students, prior achievement made explicit mention of assessments in terms of grades or their own assessment of the students' previous learning. The excerpts presented below demonstrate how prior achievement was used in the stories.

Excerpt from S02.1

S02: So the group, three girls, one guy, and they were all A students, but the girls are like higher A than the boy.

Excerpt from S03.1

S03: She was also a B student while the— all the rest were A students, so I think she's positioned as low status.

Excerpt from S03.2

S03: She works really hard. She is a B student. Her group is B students. Gabby. There is a B student here. And then Avery. She is a high A student who gets things faster. He makes mistakes which I think is good. But he is the math authority in

this group for sure and what I noticed throughout the pattern, throughout the task that they did is... they were always talking with part of it, then they would come together and get a consensus on each one, but everybody tried themselves first. And so, each person had to kind of share what they thought about their problem but what happened after their brief amount of sharing is both of the B students continued to ask Avery, “wait, how did you do this one? How did you do...?” [...] Gabby was able to point it out and have a high status moment where she like corrected the A student but up until that point it was just— I don’t know I think it just comes from her perceptions that she wants to understand, she wants to be correct. So she won’t trust herself. I think that comes from like kind of how hard she works but can’t get to that A level. She still performs at a B level. And she is a minority race in her math class. She is a freshman in Algebra 2. So she is really cruising along and I wonder if that worries her, like, “Okay, if I can only get a B now, what does that mean when I go into the harder class?”

Excerpt from S05.1

S05: Um. But yeah, he just— like, in class, he does great. He has, like, an A+ or something, and always knows what he's doing, but he just doesn't like to talk.

Excerpt from S05.2

S05: My focus student has really really high math status. He is really super smart has like over 100% in the class but he doesn’t talk. He doesn't like to participate that much. [...] He’s kind of just a shy student, really smart. So um, I wanted his ideas to be expressed because he’s got some really good ideas [...] So I placed him in a group with another student who is like really high status socially and he is really high status mathematically also.

S10: Okay, so that’s a good—

S05: So similar math but opposite levels. Actually, all four of them had pretty high math status. They were all around the same level. But the social status varied. Two of them were high social status and two of them were not high social status.

Excerpt from S07.1

S07: Yeah, she's not, she's not doing so well this year because she hasn't...

S06: She hasn't done anything?

S07: She hasn't worked in a month.

As seen in the excerpts, above, the framing of prior achievement focused on students' prior mathematical successes by describing their high levels of achievement in terms of grades (i.e., "They were all A students," "He has, like, an A+ or something"). In these positive assessments of students, which were intertwined with discourses of ability, the stories also framed the issue of status by referencing students' characteristics such as personalities and levels of confidence. Taken together, these framings suggested that the students were competent, and one would expect the students to be more central and influential in the groupwork; however, as noted previously, this framing also suggested that the notion of "social status" is important to understand the status hierarchies. That is, students with the highest levels of achievement are not always positioned as highest amongst group members and that even among high achieving students' status hierarchies emerge.

Only one story used achievement framing in a negative sense (S07.1). In this story, the focal student was described as not having completed the work in the class ("She's not doing so well this year [...] she hasn't worked in a month"). This story was also wrapped in the discourse of ability, in which the student was positively assessed. In this story the student has the ability but is not achieving at a commensurate level. This story framed the problem of status, in part, as due to the student; S07 diagnosed the issue by focusing on the student's decision to not engage, even though the focal student was more than capable. In the secondary stories, the prospective teacher supported this framing with the following statement:

Ultimately it's the grades that are gonna have to, you know, make her decide. 'Oh wait, I need to get those points back,' you know. And we'll see. This last test was pretty brutal, last quiz, I'll see if she changes her mind.

The other stories used students' prior achievement to positively assess students' ability or capability while noting these students' levels of "high math status"; however, despite students' prior mathematical achievement status hierarchies emerged where these students were not high in the observed status hierarchy because of the students' characteristics or personality (e.g., S05: because "he just doesn't like to talk.")). This framing is consistent in with another story told by S05 in which the recommendation that maybe "he thinks they are stupid" was rejected. In secondary small stories, the prospective teachers continued to discuss the source of the status issue and S02 made another suggestion:

S02: I'm also wondering if he's put with like other lower math status students, would he share more?

S05: Yea, that's a good point. That would be something to look into, if I did position him with lower– That kind of happened for my first round. He only talked again when I would like– He had something on his paper and he wouldn't share it until I was like, Emmmit what'd you do?

These stories illustrate the way that ability and prior achievement were used to frame the issue of status as arising, in part, due to students' characteristics (i.e., personality) which focused the blame on the not having the right composition of students. The small stories told by S05, of which excerpts appear throughout this chapter, provide an illustrative example. S05 considered the suggestion for placing the focal student (earlier positioned as competent in terms of ability and achievement) with students that are "lower math status students." S05 considered this as a possible problem which demonstrates that having the right mix of student personalities makes sense to have groupwork function correctly. Yet, based on prior experience, S05 noted that she

had tried that strategy and it didn't work. This served to refocus blame on students' willingness to participate in desired ways (and students choosing not to participate in those ways because of personality type or preference).

Within these stories that framed status issues, in part, in terms of ability and prior achievement, the prospective teachers also recognized that status was not necessarily a static trait of students. For instance, S03 stated: "Gabby was able to point it out and have a high-status moment where she like corrected the A student." The focal student, Gabby, had been positioned in the story as somewhat less competent than her peers. Yet, the prospective teacher did not resign Gabby to always having low status and instead noticed an instance in which Gabby was differently positioned in "a high-status moment." Similarly, S06 noted that she observed the flexible nature of status as a focus student changed contexts. In a secondary small story, S06 stated:

I just think it is really odd and really interesting how in like one context he was this really strong self-identified math student but then all of a sudden you put in with students that he identifies as having a higher math status than him, then all of a sudden he kind of like, stops himself and compares.

Even though students were ranked as low- or high social and/or mathematical status, for these prospective teachers the ranking of status was not necessarily deterministic but dynamic within the composition of students.

Discussion

In this chapter, I have demonstrated how the stories told by prospective mathematics teachers about status in groupwork relied on students' abilities and prior achievement.

Featherstone and Crespo (2012) argue that the notion of status, as employed through CI, can aid teachers to see the mathematical brilliance of students that have previously been unsuccessful at

school mathematics. In their study with prospective elementary teachers, Featherstone and Crespo (2012) observe:

In [the prospective teachers'] reflections, the discourse of status largely replaces the discourse of ability. We think that this is an important development, because [...] while the language of ability locates the problem in a fixed attribute of the child, the language of status points to a problem in the context. Locating the problem in the context—in this case the classroom culture—sends a message that the teacher can do much to fix it (p. 133).

They continue:

Changing the language can be powerful: When children who have been described (even if only in the teacher's mind) as "my low kids" become "low status kids," failures that have been attributed to the children's lack of innate ability are recast as problems with classroom culture. They become, in short, teaching problems, problems that we as teachers may have the power to solve (p. 137).

Featherstone and Crespo make a distinction in the framing of "low kids" and "low status kids." In Featherstone's and Crespo's interpretation, "low kids" is keyed (Goffman, 1974) to a diagnostic framing that can perpetuate deficit notions of students' mathematical ability. Such diagnostic framing is inconsistent with CI since CI purposefully seeks to expand students' concepts of what it means to be mathematically smart and to identify the contributions that students make to their groups' efforts. In contrast, "low status kids" is keyed to a diagnostic framing that identifies the problem of status as a function of a group's interactions. This subtle choice of language has the potential to shift the framing and the source of the problem of status; however, without awareness of the theoretical underpinnings of expectations states theory, I contend that replacing "ability" language with "status" language can continue to locate the problem in the students. The data analyzed in this chapter reveals that status did not simply replace the language of ability—status and ability were coordinated within stories to make sense

of the observed status hierarchies. The source of the status problems largely remained as an attribute of the students. Rather than replace, status and ability were coordinated to create a *kind* (Hacking, 1986, 2007): “low status kids” (Crespo & Featherstone, 2012, p. 137) and “lower math status students” (S02.1). I discuss this idea more fully in the concluding chapter. At this point, I will continue to discuss the coordination of mathematical histories with status.

In the stories from the prospective teachers analyzed here, the language of ability was coordinated with the language of status. Ability and status were weaved together as justification for why the status hierarchies emerged as they did. At times a student’s ability was used to justify that a student should have been able to participate in ways that was different from what was observed. In these cases, the prospective teachers highlighted that students’ characteristics played a more prominent role in the development of a status hierarchy. This is similar to what I discussed in the last chapter, where the specific status characteristic (i.e., mathematics ability) was not as useful a predictor as students’ popularity. Popularity throughout these prospective teachers’ stories was related to “high social status.” Other student characteristics, such as shyness or reservedness, were used to explain why some students were positioned as low status within the group—even though they had “really really high math status” or were “smart.” The way these stories functioned to coordinate ability and status bring into focus the social aspect of secondary mathematics classrooms.

Horn (2017) emphasizes that mathematics classrooms are fraught with social risk. Social risks are threats to the way one is perceived by others. Horn states, “Although social risk is felt in many classrooms, mathematics classrooms are particularly burdened with social risk. Mathematics, as a school subject, is culturally anointed as the ultimate measure of smartness” (p. 4). The perspective of social risk complicates the possible interpretations of the emergence of

status hierarchies. Consider the student that S05 described as “really smart” and S02 suggested that perhaps he thinks the other students are just “stupid.” With the idea of social risk, it may not just be that he has low expectations of his group members’ potential contributions, but indeed there are social relationships that are being maintained, or boundaries of belonging to different social groups, that are being maintained through the isolating behaviors. Managing such social risk is on top of the risk as acting in ways that may create on as a “geek” *kind* for their high achievement or fondness for mathematics as a subject. On the other hand, not performing well in mathematics class may cast a student as another dull, idiot, or stupid *kind*. In this regard, S03 shared that Gabby a “B student” may have been managing social risk, or stereotype threat (Spencer et al., 1999; Taylor & Walton, 2011), regarding her placement in the advanced mathematics course. The notion of social risk is related to the third-order status beliefs. With third-order beliefs, students do not have to accept a belief about their competence in mathematics, because they only must accept that others will act on the belief. In Expectation States Theory the most important beliefs are those most salient to a collective task at hand (i.e., the mathematics task); however, the notion of social risk and these prospective teachers’ stories highlight that students are simultaneously involved in multiple tasks of which *impression management* (Goffman, 1959, 1967) in the social life of schooling may play a central role. Although CI advocates that the composition of students in groups and their roles should be random (Horn, 2012), care must be taken to consider the social milieu of schooling. Numerous researchers have documented the role of friendship and romance in groupwork (Esmonde et al., 2009; Takeuchi, 2016; Valera & Takeuchi, 2018) and as these stories highlight, friendship and popularity might need to be central considerations in groupwork. It is complicated, though, because in the end—with goals toward *relational equity* (Boaler, 2006)—we may aim to create

environments that foster relationships in which all students can learn from one another despite differences.

Although the themes of ability and achievement–smartness generally–were notable throughout the stories, ascriptions of smartness were vague. Vague but also precise in naming specific grades and courses. This is problematic given that a main mechanism to shift status hierarchies, assigning competence, requires that teacher attribute specific mathematical strengths to students. It may have been that in the context of the storytelling there were not opportunities for the prospective teachers to share the specific mathematical strengths they observed of their students. Given the difficulty of learning to assign mathematical competence (Jilk, 2016; Pescarmona, 2015), mathematics teacher educators might purposefully create explicit opportunities for prospective mathematics teachers to name specific mathematical strengths of students. Such opportunities may also create a way to broaden prospective teachers ideas about what mathematical ways of thinking are valued and aid teachers to move away from dominant notions of mathematics which value traditional skills and narrow ways to be demonstrate competence (Louie, 2017b; Parks, 2010). Moreover, given that the focal students in these stories tended to be positioned as successful in their mathematical histories, what would it mean to “assign competence to low-status students” (Cohen & Lotan, 2014, p. 156) when low status is among a social dimension?

The stories from these prospective teachers can also be understood from a teacher noticing lens. Although, they are not analyzed in a way that is distinct to this genre of mathematics education literature (i.e., attending, interpreting, and responding), the stories are in fact instances of teacher noticing. These teachers attended to status in varied ways– including students’ characteristics, personalities, and mathematical histories. Traditionally, teacher noticing

has been constrained to noticing students' mathematical thinking. More recently, teacher noticing has considered the sociocultural aspects of mathematics classrooms (Baldinger, 2017; Hand, 2012; Louie et al., 2021). van Es et al., (2022) argue that equitable noticing within mathematics classrooms can be conceptualized as stretching and expanding. In stretching, "teachers' noticing reaches back historically and forward futuristically to inform classroom teaching and learning" (van Es et al., 2022, p. 117). The prospective teachers in this study seemed to *stretch* backward—referring to their student's mathematical histories and their knowledge of social relationships to make sense of how the status hierarchies emerged. How the teachers created characters in these stories resonated with the other teachers, it seems, since their peers rarely followed-up in the conversations to better understand what was meant by the descriptions of students. In short, creating *kinds* of students. Expanding refers to the "scope, or the myriad phenomena that are under the gaze in classroom moments" (van Es et al., 2022, p. 118). In this study, the prospective teachers were asked to focus on how status was evident in the small group interaction. In noticing status, the prospective teachers were *expanding* what counts as important to making sense of the small groupwork—most notable were the aspect of students' relationships. As demonstrated in the previous chapter, as well as this chapter, the social aspects of the classroom—who was popular, who was friends with whom, and who had high social status—were salient aspects in the teachers' noticing of how and why status hierarchies developed.

Recent work on teacher noticing has highlighted the importance that teacher noticing include the sociocultural aspects of classrooms (Louie et al., 2021; Shah & Coles, 2020). Race and racialized frames influence interpretations of events. Expectation States Theory has demonstrated that race and gender are primary frames used to navigate and make sense of social

situations (Fisk & Ridgeway, 2018). Not only does race influence interpretations of students' behavior (Ferguson, 2000; Shalaby, 2017), race also influences interpretations of mathematical ability (Battey et al., 2021; Copur-Gencturk et al., 2020; Shah, 2017; Wilson et al., 2019). These stories were largely color-blind (Bonilla-Silva, 2014). There are two notable exceptions. S03 made reference to Gabby, "a minority race in her math class" and S01 noted that Harish was Palestinian. Although these two prospective teachers noted the race or ethnicity of these two students, the stories did not consider how students' may have perceived their ability as less able due to their race or ethnicity. Race/ethnicity, as a diffuse status characteristic, is an important but noticeably missing component of these small stories. It could be that these prospective teachers taught in racially homogenous classrooms—this is something I do not know given the data that I had access too. It could also be that norms of whiteness prevented this group of prospective teachers from naming and attending to the racialized nature of mathematics classrooms. Consider the following conversation during the second GLI, in response to the prompt, *What factors (may have) contribute(d) to this positioning? (historical, racial, gender, etc.):*

S07: That question is always weird to me because it's like, race and gender, I mean you don't see it every day I mean that is something that is like built up in the background.

S04: Uh hmm [affirmative]

S07: Like over time, so I mean. I don't know. I was thinking like first day those things get set up then you forget about them. And you still see them later in the year but it's not like "wait wait wait". My race card says that you are sitting over here.

S09: I think that is also why we've done so many of these because it is... something that—

S04: Unconscious bias.

S09: We can easily not think about it. But you know that we do need to actually focus—

S07: Is the question though, making yourself sound racist? [laughter] Let's assume these things.

S09: Yeah, at times.

It appears that norms of whiteness were clearly operating in this group of prospective teachers' storytelling. Norms of whiteness were operating through not only the passive omission of considering race as possible factors in the development of status hierarchies, but also in the active race-evasiveness (Chang-Bacon, 2022), as the excerpt above shows, since considering race might be "making yourself sound racist."

Lastly, while telling stories about status, *kinds* of students, related to the students' mathematical histories, were present across the small stories. One set of *kinds* were "A student" and "B student" that described the students' prior achievement. In these stories the grade/mark of the student became a *kind* of student that could sufficiently describe how the student ought to be expected to contribute to the groupwork. The creation of grade-based *kinds* reinforced dominant notions of mathematical competence and the taken-for-grantedness of hierarchies of ability (Louie, 2017b; Parks, 2010). These *kinds* of students also supported the discourse of ability where some students were labeled as "smart," "bright," or "high math status." These labels imply the opposite— that there are also students that are not as smart, as bright, or low math status. Not only does this produce *kinds* of students where some able mathematics students and others are not— it reinforces the hierarchical nature in which students are sorted and labeled by "ability" in school mathematics. Across the stories I analyzed, no students were labeled as dumb, stupid, or unable. It may be that such clear deficit labeling of students is clearly not tolerated in teaching communities, or within a teacher preparation course such as the course where these stories were told. Clearly labeling students with labels that invoke a deficit framing of students' mathematical ability may be uncouth; however, it may be that the archetypes of students replaced such clear

deficit labels of students. For instance, the jock and class clown invoke cultural stereotypes of unintelligence (Eckert, 1989; Pascoe, 2007). In the next chapter, I continue to discuss the *kinds* of students that appeared in the small stories.

CONCLUSION

Throughout the past two chapters, I have demonstrated how the prospective mathematics teachers used the notion of status to make sense of groupwork dynamics in their student teaching field placements. In the prospective teachers' stories of small groupwork, students were described and categorized in various ways. My analysis highlighted two key aspects—student characteristics and students' mathematical histories. The students in the prospective teachers' stories were made intelligible to the prospective teachers' audience (other prospective teachers) by relying on student characteristics in terms of archetypes, students' levels of confidence, and students' personality traits. In addition, the prospective teachers use the students' mathematical histories, notions of ability and prior achievement, to further describe and situate the episodes of small groupwork that were shared. These themes were coordinated with each other along with notions of mathematical status and social status. Taken together, these themes worked to (re)create *kinds* (Hacking, 1986) of students. I have described in the previous chapters how the stories worked to create some *kinds* of students (e.g., class clown, “A student”). In this final chapter, I will focus on the *kinds* of students that have low- or high-mathematical status and low- or high-social status. These are not new findings; mathematical and social status were plentiful in the examples included in the previous chapters. My goal for bringing them into sharp focus in this final chapter is to highlight how student characteristics, mathematical histories, and status worked together to create low-status and high-status students.

After discussing mathematical status and social status, I turn to discuss how the discourse of CI was a power/knowledge discourse within the prospective teachers' stories. I doing so, I return to the ideas from Critical Discourse Analysis and Critical Narrative Analysis. In the final

section of this chapter, I return to ideas from the teacher noticing literature to discuss teaching and categorizing— and the production of *kinds* of students.

Mathematical Status and Social Status

The prospective teachers categorized students according to mathematical and social status. I bring the following examples forward (see Table 4) to demonstrate how these categorizations worked. Thirteen of the initial small stories (out of 22) categorized students according to “math-” or “academic-” status. Seventeen of the initial small stories categorized students according to social status. In the second round of the groupwork lesson inquiry assignment, all except for one of the initial small stories categorized students according to mathematical and social status. It appears this categorization scheme seemed useful to the prospective teachers and its use proliferated over time. Wortham (2006) argues that schemes of classifying students (what he calls identities) emerge over time and are mediated by sociohistorical models of classification. Local schemes of categorization can be supported by sociohistorical models (Wortham, 2006) and authoritative discourses (Bakhtin, 1981). Wortham (2006) notes that at the beginning of a school year teachers often rely on broad sociohistorical models to interpret students since teachers do not know much about their students. Over the course of the school year, local models (i.e., “the loud one”, “the bossy student”) can mediate to what extent sociohistorical models are applied to students. In the setting for this study, local models of status—a distinction between mathematical status and social status—appeared to be useful categorizations for the prospective teachers to make sense of their students. Table 4 provides excerpts to illustrate how the mathematical status and social status scheme was used throughout the stories. To make this table useful for the next section in this chapter, this table is focused on statements that included the use of students *being* of a status kind, although the

distinction of mathematical and social status extended beyond these cases (i.e., *having* a type of status).

Table 4: Selected Excerpts Referencing Academic, Mathematical, and/or Social Status

Small Story	Excerpt
S01.1	I'd say all of my student are pretty low status when it comes to math, the class is set up that way. That's the students I have.
S02.1	He's lower academic status.
S02.2	I'm also wondering if he's put with like other lower math status students would he share more?
S03.1	She already positioned herself as kind of a low status student in a sense that she started off as saying, 'I'm bad at this' already.
S03.2	I feel like with my students who, in the same way who want high status and pretend not to care, when they do those things they get a validation from other high status students where they are like laughing at them, not laughing <i>at</i> them but they are like making a joke out of it
S04.1	The higher status student did keep focusing her questions onto him.
S04.2	My focus student is lower academic status and lower social status.
S05.2	So I placed him in a group with another student who is like really high status socially and he is really high status mathematically
S07.2	And then there was like two high math-social status students at the table.
S08.2	High math students are the ones that will go like, 'ugh' and kind of roll their eyes. But the high social status students... these are low tracked or average tracked students. I made those groups on purpose to help the lower status students.
S09.1	And so the reason I picked this group is because the girl is very high status, like high social status...
S11.2	I think that one thing you said that was interesting was that you had two high status students sitting across each other and the low status students sitting across from each other and that enabled them to participate in pairs. Wanting to mix up the low status and high status students and wanting to mix up high ability and low ability and like just getting them to work together...

Mathematical status and social status were most frequently (but not always) set in opposition to each other throughout the stories. The notion of mathematical status was frequently coordinated with students' mathematical histories. Students that the teachers perceived to have the ability to be successful in school mathematics and students that had previously been successful in terms of achievement were cast as "high mathematical status" *kinds*. At times,

students were categorized as high mathematical status but were not influential in the group. In these occurrences, the prospective teachers noted the role of students' personalities (i.e., reserved, quiet, not talkative) and/or levels of confidence to explain why the student was not the most influential student in the group. Similarly, social status was used to categorize students in terms of popularity and while also being coordinated with archetypical school *kinds* (e.g., class clown, jocks) to explain a group members' influence. Students categorized as having high social status could be bossy or domineering and/or were confident. Social status was related to students' general personality and disposition to be outgoing or extroverted.

Student(s) in the prospective teachers' stories either *had* low- or high (mathematical and/or social) status or *were* low- or high status students. In one sense, status was a possession (S08.1: "[The students] give Zach a low status [...] he has really low math status in the classroom) that is "given" to students. To some extent the verb *give* acknowledges that status is created in the students' interaction rituals. In another sense, status was a *kind* (S09.1: "The girl is very high status."). To emphasize the point that status is not a static trait of children, Featherstone, et al. (2011) purposefully discuss students as "*having* [emphasis original] low or high status rather than *being* low-status or high-status students" (p. 35). Rather than being low or high status the others suggest that it might be more productive to think about students as "*being in situations* [emphasis original] where others act as though some students have much to contribute whereas others have little" (p. 35). This subtle distinction seems like a fruitful shift to avoid thinking about status as a character trait in its own right. Status as a possession is consistent with Ridgeway's (2019) description in that status "is not taken and possessed, but rather it is *given* [emphasis original] by others" (p. 48). From Ridgeway's perspective status is a possession that can only be *given*. This is counter to some of the stories where students

positioned themselves as low status (e.g., S03.1, S08.2). Students may certainly position themselves as less competent than other students, must then other students must concur and act on the belief that the student is less competent to create the status hierarchy. Nonetheless, *having* status versus *being* status, either way, can lead toward the creation of *kinds*. Having low status—just like having a fixed mindset or not having grit—still categorizes students into *kinds* of students. Whether it is a *kind* of student possessing high social status, a kind of student possessing low mathematical status, or a student being positioned within a hierarchy, the categorization impresses upon us that we know something about the student and in the future will expect them to act in certain ways. This is making up students. In the next section, I offer one explanation for how CI has aided in making up low status and high status students.

Making Up Students

Hacking (1986) explained that “numerous kinds of human beings and human acts come into being hand in hand with our invention of the categories labeling them” (p. 236). Through the previous chapters, I have argued that CI has contributed to creating new *kinds* of students, namely low status students and high status students. The theoretical framework that I presented explains that *kinds* are made up through power/knowledge discourses as well as through interaction rituals. To some extent, the power/knowledge discourses of CI has made up students. The following list is a genealogy of making up low status and high status students in the mathematics education literature. I present the list in chronological order and wish to emphasize the statements—as a function of authoritative discourse (Bakhtin, 1981)—and not the authors. A brief genealogy:

- “Do lower rates of interaction have negative effects on learning for **low-status students**?” (Cohen, 1984, p. 174).

- “In this way we solved the problem of the differential access of **low-status students** to the learning materials and activities” (Cohen et al., 1990, p. 225).
- “**Low-status children** tend to interact less frequently with classmates than do **high-status children**” (Lotan & Benton, 1990, p. 59).
- “Unless teachers treat [status] problems, **high-status students** will continue to dominate the interaction and learn more than **low-status students** who will be shut out from the group and will learn less”(Cohen et al., 1992, p. 58).
- “When **low-status students** have access to the interaction, they also have greater access to learning”(Cohen et al., 1994, p. 87).
- “Students who look as if they are not participating—many of them **low-status students**—may in fact be shut out by the other members of their group” (Lotan et al., 1996, p. 351).
- “**Low-status students** were often seen as unable to provide intellectual insight, rarely asked to voice their opinions, and allowed to do little substantive work. Miguel, **the low-status student**... Stephanie, **the low-status student** in Group 3...” (Bianchini, 1997, p. 1055).
- “**High status students** have a significantly higher average rate of on-task talk than either their middle or low status counterparts, and **middle status students** have a significantly higher average rate of on-task talk than **low status students**” (Bianchini, 1999, p. 593).
- “For example, when at the end of the year Galen was working with a **high-status student** who tended to work independently” (Gresalfi, 2009, p. 357).
- “[CI] was first and foremost a method for not boring pupils and developing different types of competences both for **low- and high-status students**. Encouraging low-status students to participate and so to change the teachers’ (low) expectations was only a secondary aim” (Pescarmona, 2010, p. 224).
- “If teachers are to give group grades, they must be very attentive to the group dynamics to ensure that **low-status students** are not begin excluded and everyone is actively engaging and contributing productively” (Watanabe, 2012, p. 82).
- “[CI] prompted them to activate new expectations for competence and fresh social dynamics that included **low-status students**” (Pescarmona, 2014, p. 192).
- “These are all ways of being smart that are not always names as such but that can be taken on by **both low- and high-status students**” (Tsu et al., 2014, p. 138).

- “Rendering **low-status students** unable to make effective contributions to the group” (Bannister, 2015, p. 363).
- “[Mindset teaching] practices were identified through synthesizing two areas: literature that explicitly connects teaching practice to mindset... and literature related to teachers’ or students’ perceptions of mathematical ability or intelligence being limited to a few **high-status students**...” (Sun, 2018, p. 331).
- “For example: a student with low status engaged in playful talk to position herself with competence, while a **high-status student** engaged in playful talk to position others as less competent and, in doing so, maintained his status” (Langer-Osuna, 2018, p. 7).
- [CI] includes pedagogical moves known as ‘status treatments’ by which a teacher intervenes to assign higher status to a **low status student**” (Sengupta-Irving & Vossoughi, 2019, p. 483).

The following list provides a small glimpse into the types of statements from the mathematics education literature that has aided in the creation of additional *kinds* of students. It is not surprising that the prospective teachers drew on the institutional discourses of CI to similarly categorize and make sense of their own students. I have reasoned with the notion of power/knowledge discourses to understand what made possible the low status and high status *kind* of student in the prospective teachers’ stories. CI is certainly not the only power/knowledge discourse within mathematics education that influences how teachers make sense of an interpret classroom events. Other power/knowledge discourses include the need for rote practice and memorization to be successful in mathematics, the hierarchical nature of mathematics (Louie, 2017b), and the apolitical nature of mathematics. Louie (2016, 2017b), and Parks (2008, 2010) argued that the commonsensical ways to think about teaching and learning mathematics can be in conflict with equity oriented goals of teachers’ learning. This study provides an additional case where teachers dominant ways of thinking undermined the learning goals. In this study teachers were learning to interpret groupwork in equity-oriented ways, where the construct of status could

be useful to think about fostering the conditions for equitable groupwork; yet, in drawing upon the discourses of CI students were problematically categorized that may have hindered teachers' learning. One implication of this is that as a field we need to more fully consider how to support teacher learning with equity-oriented pedagogies of CI, while being ready to challenge unproductive aspects. For instance, being aware of the ways the classification of low math status and high math status student can lead to unproductive thinking related to notions of ability. In the next section, I return to ideas from critical narrative analysis to more fully consider how CI acted as a power/knowledge discourse to inform the prospective teachers' stories.

Complex Instruction as a Power/Knowledge Discourse

In this study, I employed critical narrative analysis (CNA) (Souto-Manning, 2006, 2014) as a guiding methodology to understand how the prospective teachers made sense of groupwork—with particular regard to the construct of status—as they told stories to their student teacher peers. CNA is forged from narrative analysis (Rymes & Wortham, 2011) and critical discourse analysis (CDA) (Fairclough, 2013). Narrative analysis is primarily concerned with how stories that are told construct a truth about someone or something. As Rymes and Wortham (2011) state, “narratives do not transparently represent the world but instead select from among many potentially relevant facts and craft them into a coherent whole” (p. 38). CDA is concerned with the interactions of power and language; the point of CDA is to promote social action and change. CNA, as a combination of narrative analysis and CDA, is concerned with how power operates within narratives and acts of storytelling; CNA should promote action and change. This study demonstrates how CI functioned as a power/knowledge discourse (Foucault, 1972). In this section, I will first discuss how CI operated as a power/knowledge discourse and then discuss

how such awareness might prompt action and/or change with regard to how we think about the notion of status with teachers learning to implement CI.

Souto-Manning (2006) demonstrated how institutional discourses can infiltrate into the stories individuals tell to make sense of their life experiences. For example, she described how the Brazilian government's campaign against raising the minimum wage worked its way into women's narratives to ultimately rationalize their own oppression. Souto-Manning (2006) states, "a discourse is made powerful when it is recycled in stories everyday people tell" (p. 131). Similarly, in this study CI was made powerful as notions of status permeated the prospective teachers' stories. This is not totally surprising because the prospective teachers were in a methods course learning to implement CI; however, this does not diminish the role that CI played in aiding the teachers to construct classrooms realities that contained *high-status* and *low-status kinds* (Hacking, 1986, 2007). CI, through its use and study within the methods course was legitimized to make sense of students' interactions. As Bakhtin (1981) states:

The authoritative word demands that we acknowledge it, that we make it our own; it binds us, quite independent of any power it might have to persuade us internally; we encounter it with its authority already fused to it. The authoritative word is located in a distanced zone, organically connected with a past that is felt to be hierarchically higher. It is, so to speak, the word of the fathers [sic]. Its authority was already *acknowledged* [emphasis original] in the past. It is *a priori* [emphasis original] discourse. It is therefore not a question of choosing it from among other possible discourses that are its equal (p. 342).

CI, as an authoritative discourse—legitimized by the teacher preparation program curriculum—was taken up, acknowledged, and recycled in the prospective teachers' stories; in this sense, CI acted as a power/knowledge discourse constructing the realities of classroom life.

It is not just that CI served as an authoritative discourse (Bakhtin, 1981) or a power/knowledge discourse (Foucault, 1972), but a discourse that worked to create *kinds* of students. Foucault (1972) argued that discourses form over time and reach a threshold of formalization (see Table 1, page 39). Having reached this threshold, CI is “taking itself as a starting-point” (Foucault, 1972, p. 187) which posits that there are distinct *kinds* (Hacking, 2007) of students in mathematical classrooms: low- and high- status students. Hacking (2007) argues similarly to Foucault (1972) that when institutions (e.g., teacher preparation) take-up classifications and build knowledge around the type of people under consideration, they “firm up” (Hacking, 2007, p. 288) and “invite stereotypes” (p. 289). These prospective teachers’ stories relied on low status and high status *kinds* of students as the starting point for their stories. Largely, “high social status students” were problematic to groupwork by engaging in off-task behaviors or exerting undue influence on the group’s thinking. “High math status students” were able and successful in mathematics classes, yet uninterested in working with their peers due to the social aspects of schooling or because of their personal characteristics (e.g., shy, reserved). CI provided a discourse which aided the prospective teachers to tell stories about these *kinds* of students and (re)constituted the social world of the classroom in which various *kinds* of students were taken for granted: More able, less able, very smart, jocks, class clowns, A students, B students, and so on.

Foucault (1972, 1980) contends that power/knowledge discourses are neither good nor bad, but that they produce effects. CI as a power/knowledge discourse is neither good nor bad, but clearly this study has shown it aids in the production of *kinds* of students. And, if *kinds* welcome stereotypes (Hacking, 2007) then mathematics education as a field ought to be vigilant and interrogate the *kinds* of students produced through the discourses of CI. As demonstrated in

the literature review, CI as pedagogy has to potential to enhance learning and foster more equitable opportunities for learning than traditional teaching methods. At the same time, CI may unproductively aid in the production of *kinds*. Consider the discourses of growth mindsets (Edwards et al., 2016; Sun, 2018) and grit (Kirchgasler, 2018) where students are surveilled and classified with regard to whether they have a growth mindset (or not) or have grit (or not)– and then treated based on these classification. Measures of mindsets and grit might be informative to understanding psychological relationship with mathematics; however, as tools to aid in creating equitable learning environments they seemed to have ignored the systemic issues that impact students’ lives and position students’ minds and dispositions as problems–kinds of students that need to be fixed through schooling.

Does CI rely on the classification of students as low status or high status? If low status and high status students are taken for granted as ordinary in mathematics classrooms, what may happen over time as teachers use CI and implement groupworthy tasks, multiple abilities treatments, and assign competence? I argue that the looping effect (Hacking, 2007) may occur in such classrooms. Students having been categorized as low- or high status will, generally, continue to conform to that classification. It may be that the behaviors of “low status students” change, but what is “true of them” (Hacking, 2007) will likely also change. That is, slowly over time, the meaning of the classification may change so that “low status student” are stuck (at least with that teacher, and perhaps their peers) as a “low status student.” What action and change might the mathematics education community take with such awareness? Next, I describe how the construct of status might be productively used without “making up” students.

Status as Performative

As a reminder, CI is grounded in the notion of *status* which is derived from Expectation States Theory (Correll & Ridgeway, 2006; Ridgeway, 2019). Within CI, *status* seems to be employed as a trait of students. As a field, there seems to be a misinterpretation of status as a construct and a confusion between status as a hierarchy and status characteristics. For instance, Engle et al. (2014) state:

rather than viewing authority as a characteristic of individuals as in the construct of status, we consider authority as being affected by local negotiations about who should be more or less credible source of information vis-a-vis the particular topics being discussed (p.252-3).

I have argued that it is unproductive to think of status as a characteristic of students while also arguing that when ideas of status are coordinated with student characteristics and mathematical histories it potentially limits the usefulness of CI because the attention is on the student rather than the students' interactions with one another. In contrast to the view of status as a characteristic of individuals, within Expectation States Theory *status* seems to describe the interactions. The creation of *status* is linked to, but distinct from, *status characteristics*. Consider the following set of statements:

Status *between* [emphasis added] individuals and status *between* [emphasis added] groups are linked by the widely held status beliefs that both represent the social standing of groups in society and cause group differences to act as status characteristics in interpersonal settings (Ridgeway, 2018, p. 1).

Status is a form of social inequality based on differences in social esteem and respect that, in turn, yield influence (Ridgeway & Correll, 2006, p. 431).

In the quotes above, status exists in the *between*-ness of individuals or groups. This is explicitly mentioned in the first quote. The second quote defines status as a “form of social inequality” which can only exist in the difference between individuals and/or groups. Within the realm of CI, I argue we should emphasize status as an element of interactions. We should stop using status as an adjective of students. Mathematics teacher educators might unabashedly point out that status cannot exist without the interaction as to take the focus off students having, possessing, or being a status.

Status as an element of interaction is not to say that status characteristics of individuals do not influence individuals’ actions. As Goffman (1959, 1967) argued, individuals manage their expressions in accordance with how one wants another to perceive them. Status is captured between the expressions given by one person (*expressions given*) and the way they are perceived by another (*expression given off*). The expressions given off are partially available for analysis in the way one responds to the *expressions given*. Teacher educators might focus on the expressions that contribute to the formation of a status hierarchy. To conceptualize status as interaction in this way, I draw on the concept of performativity (Butler, 1988). To create a parallel to Butler’s notion of gender as performative, I have replaced “gender” with “status”:

If [status] is instituted through acts which are internally discontinuous, then the *appearance of substance* [emphasis original] is precisely that, a constructed identity, a performative accomplishment which the mundane social audience, including the actors themselves, come to believe and to perform in the mode of belief (p. 520).

From this perspective, status is mobilized through students’ actions and/or expressions. Such actions in mathematics classrooms may be those actions which create differential opportunities for learning. For example, actions that exert influence in what mathematical ideas are taken up by the group or sequester some students to do menial work. Over time, such actions may create

the “appearance of substance” (Butler, 1988, p. 520)—*kinds* of students, low status students, high status students—but these are fictitious. From the perspective of performativity, status is created in the moment to perform a function given each persons’ expectations and framing of the situation at hand (Goffman, 1974). Thinking about status as residing in the interaction, rather than with a person (as a “low status student”) can aid interpretations that focus on changing the dynamics of the group (and not the group members themselves), rather than resigning issues of status to students’ characteristics, personalities, and abilities. I content that this perspective—an emphasis on status as performative—within teacher education may invoke prognostic frames that focus attention on the social ecology of the class that the teacher can change, rather than relying of diagnostics frames which can attribute blame to students.

There is evidence in this study that some of the prospective teachers were not thinking of status as solely a trait of students. For instance, in two small stories shared earlier, S03 shared that “Gabby was able to point it out and have a high-status moment where she like corrected the A student.” S03 was also the only prospective teacher that did not use the social/mathematical status distinction and this teacher noted “high-status moment” which is more aligned to the performative perspective. This is not to say that a performative perspective will necessarily end the creating of *kinds*. In the excerpt just mentioned the “A student” still appears as a kind. S06 also used status in a way that status was not a trait of the student. For example, S06 stated: “In like one context he was this really strong self-identified math student.” This prospective teacher saw status as related to the context and students “being situations where others act as though students have much to contribute whereas others have little” (2011, p. 35). These examples point to the way that some teachers were thinking about status as malleable and context specific. In learning to implement CI, prospective teachers might be better served with explicit opportunities

to consider *status* as performative within groupwork, giving rise to an illusionary substance. Teacher educators may also directly discourage discourse, labels, and categorizations that appeal to creating *kinds* (low status students, high status students, A students) by re-focusing attention on the acts that create *status*. In the next and final section, I return to the literature of teacher noticing to discuss categorizing students.

Teaching and Categorizing

Just as the general practice of categorizing is germane to human social practices (Bowker & Star, 2000), categorization is embedded in the work of teaching. For instance, the idea of mathematics teacher noticing (M. G. Sherin et al., 2011) provides schemes of interpretation to make sense of students' mathematical thinking. Teacher noticing research is grounded in Goodwin's notion (1994) of *professional vision*. From an anthropological point of view, Goodwin (1994) asserts that each profession has developed "socially organized ways of seeing and understanding events that are answerable to the distinctive interests of a particular social group" (p. 606). Goodwin's argument is that each profession has created a structure through which members of that profession come to see, perceive, and understand the world. *Professional visions* make a profession learnable through the discursive practices (use of language and actions) of coding, highlighting, and representing. Learning to implement CI can be thought of as developing a specific type of *professional vision*— a vision or disposition to see students' interactions as influencing their opportunities for learning where the construct of status is an important role in interpreting classroom events. In Goodwin's parlance, coding schemes are the ways that professions systematically categorize phenomena to make the phenomena relevant to the work of the profession and fit within a larger scheme. In this study, I demonstrated that the prospective teachers coded classroom events (as status issues) and coded students (as *kinds*

according to levels of status). Professional visions and coding schemes are enmeshed in culture and ideology (Louie, 2017a). In teaching (prospective) teachers to notice status hierarchies, we need to be careful with how to talk about students and avoiding classifying students as low status and high status students. As Louie (2017b) puts it, “the culture of exclusion has a tendency to assimilate practices labeled inclusive such that apparently inclusive practices (such as differentiation and cooperative learning) may come to serve exclusionary ends” (p. 515). By continuing to classify students as low or high status students, CI and its proponents may get stuck in the narrow dominant mathematics paradigms that begs to classify students in dichotomous ways.

In my implementation of the GLI assignment, from which data for this study was generated, I may have unknowingly invoked low/high status classification scheme. In the assignment I asked the prospective teachers to identify a focal student that I defined as “students that have ‘low status’ among their peers” (see Appendix A). In defining the focal students in this way, I drew upon the power/knowledge discourse of CI; it was “always-already present” (Foucault, 1978, p. 82); we were “always-already trapped” (Foucault, 1978, p. 83) by the discourses. This fact of being trapped in the thick discourses of CI, oblivious to the categorizations that I was offering through the assignment is what Bowker and Star (2000) call naturalization. Once classification schemes are naturalized it is easy to forget that classification is occurring. Once categorization becomes naturalized it is difficult to understand how the categorization shapes our world views. In this study, I have pointed to some consequence of classifying students in terms of CI’s low status and high status students. Namely, that the classifications, at least with these prospective teachers, can be intertwined with notions related to students’ characteristics and mathematical abilities. Ultimately such coordinated systems of

classification undermine the potential for CI to create classrooms with expansive views about what counts as mathematical smartness, who can be mathematically smart, and who gets to meaningfully engage in rich mathematics.

Additionally, the use of focal students shaped teachers' stories. Focal students may have made the students' characteristics and traits more salient since I initially asked them to focus on a student. The teachers' lenses were on the individual student, just like I asked, which left little room for the prospective teachers to consider the dynamic, relation, and/or performative view of status that I now suggest. Two aspects of the assignment, the selection of a brief video clip and transcription of that clip, did shift teachers' perspectives of the groupwork. Anecdotally, the prospective teachers shared in their reflections a new awareness for how students were interacting. In future iterations of a GLI, I would suggest prospective teachers to collect video of their students in small groups, although, I would change the focus of observations to the group's norms of interacting rather than individual students.

To return to Goodwin's notion of professional vision, the second aspect concerns *highlighting*. Highlighting is about making certain elements of the perceptual field salient. How do we highlight what is worth coding? In mathematics education, we tend to highlight the notion of status through students' body language, influence in small groupwork, and authority in small groupwork (e.g., McDuffie, Foote, Drake, et al., 2014). In the prospective teachers' stories, students' characteristics tended to be about extroverted versus introverted behaviors. The prospective teachers' attention to social status suggests they understood the important role of peer status and local status characteristics (Cohen & Lotan, 2014). It is notable that other student characteristics were absent in the data, for instance descriptions of students' socioeconomic status, appearance, and attractiveness. These additional ways that people are "read" do indeed

play into how students interact with one another. Although it may seem creepy to talk about students' attractiveness, culturally we have notions about ideal style and body types. I did not highlight the ways that such status characteristics may influence the production of status hierarchies, but as a field we should highlight these aspects. Similarly, race and ethnicity were not salient factors in these prospective teachers' stories. The Expectation States Literature is clear about how race, as a status characteristic, contributes to status hierarchies— White people are advantaged in interdependent tasks (Corra, 2020). As with other spaces in the mathematics education system (Louie et al., 2021; Shah & Coles, 2020; Shah & Crespo, 2018), teacher educators need to continue to highlight and interrogate the role of race to aid in teachers' sense making about classroom events.

Furthermore, when designing learning experiences for prospective teachers, teacher educators must be careful to not reduce CI to technical aspects. The technical aspects of CI (i.e., designing groupworthy tasks) are useful to help think about designing and facilitating the learning of mathematics students, but there must be an overall vision for the purposes of groupwork and an understanding of how status is generated among students. CI was created to aid in solving the problems of inequitable classrooms, where student success is predictable by status characteristics such as English fluency and race/ethnicity. The technical aspects of equity and justice oriented teaching cannot be meaningfully extracted and then simply enacted (Schiera, 2021). Learning to implement CI requires the cultivate of an equitable vision and commitment to interrogate how we “see” students and how our classifications of students come to matter—how they create *kinds*. In this study, as *kinds* of students were created, they occurred within stories with diagnostics framings that partially attributed blame according to their *kind*-ness. There were few stories in which the prospective teachers used prognostic framing to think about creating and

supporting the students in equitable groupwork by way of the technical aspects of CI. For instance, assigning roles and participation structures. This is important because it demonstrates an opening that these teachers understood that they had control in changing the conditions which could amplify equitable opportunities for learning. However, the prospective teachers also use diagnostic framing which diagnosed the problem of status as internal to the students (i.e., high mathematical status). This suggests that need to emphasize and cultivate prospective teachers' disposition to view status issues from the performative perspective, which is more aligned to the original sociological perspective of status (Swanson, 1997). Without this type of perspective we might end up with techniques of CI that reproduce inequalities because we view them from a stance that puts the problem of status on the students, rather than the conditions and social beliefs/ideologies that may be at play.

Lastly, this study contributes to the literature regarding representations of practice. The use of video is commonplace in teacher education and teacher preparation. In learning to implement CI, what type of video ought to be used? At times video is used from cases to illustrate teaching practices (i.e., NCTM Principles to Actions toolkit). These are indeed valuable and can be used to provide initial focusing on status (McDuffie, Foote, Bolson, et al., 2014; McDuffie, Foote, Drake, et al., 2014; Turner et al., 2012). Such videos may provide a way for teachers to come to know that status is relevant in groupwork. As Wortham (2006) points out, often in the beginning of a new school year teachers must rely on metapragmatic models to interpret students' intra-actions. Metapragmatic models utilize characteristics types of students, or culturally salient kinds of students (Hacking, 1986, 2007) available within power/knowledge discourses. Watching video of classrooms in which teachers have not intra-acted with the students is likely to reinforce teachers' drawing on such metapragmatic models. In terms of

status characteristics, thoughtful use of video may help to reinforce how diffuse status characteristics such as race, gender, and language fluency influence the formation of status hierarchies. This is extremely important to know and recognize, but not enough. This study demonstrates that videos from teachers' own classrooms can play an important role in learning about CI.

In this study, the prospective teachers created and studied their own representations of practice. In doing so, the prospective teachers were afforded opportunities to draw on the local construction of kinds (i.e., high social status students). Over a school year practicing teachers rely less solely on metapragmatic models to interpret students' intra-actions (Wortham, 2006). Similarly, van Es et al. (2022) demonstrated how equitable noticing of practicing mathematics teachers stretched back historically and expanded in scope. For the prospective teacher in this study, they too drew on their local understanding of students— both historically (i.e., students' mathematical histories) and expansively (e.g., considering their knowledge of the social aspects of their local context). The prospective teachers' attention to their own students while student teaching provided additional ways to notice status that went beyond attending to status through diffuse status characteristics. Prospective teachers might be further supported through activities where they can draw on their local knowledge and interrogate unproductive discourses (e.g. creating low status and high status kinds) that classify students.

Conclusion

This study focused on the idea of status within CI. I have argued that the idea of status played a central role in the prospective teachers' storytelling about groupwork. CI functioned as a power/knowledge discourse that in turn created *kinds* of students. The concept of status did not only aid in the creation of kinds, but status was coordinated with other notions such as ability.

“Low status students” and “high status students” were made normal and ordinary aspects of mathematics classrooms. The significance of this study is not that status played an important role in the prospective teachers’ storytelling. The significance of this study is that status was used to categorize students in ways that may limit a productive response. The intention of this study was never to argue whether CI can lead to more or less equitable classrooms. The intention of this study was never to argue whether CI is good or bad. Rather the intention of this study has been to surprise us with awareness.

APPENDICES

Appendix A: Groupwork Lesson Inquiry

Assignment description: The purpose of this assignment is to design and implement a group worthy task while being deliberate about the way you facilitate and interact with students that have low status among peers. In order to make mathematics learning equitable it is imperative to consider students that are marginalized in the mathematics classroom and carefully consider the ways teachers can create opportunities for students to participate more centrally. In previous courses you have studied the ideas from complex instruction (Cohen & Lotan, 2014) in general. In this assignment you will use the ideas from complex instruction in relation to students that you interact with regularly. To think about how complex instruction applies to your context you will choose one or two focal students, design a group worthy task with your focal students in mind, implement the task in your field work placement, and reflect specifically on you focal students' learning, interactions, as well as your interactions with your focal students during the lesson.

Part 1: (*Written during class session*)

Identify focal student(s): Choose one or two focal students that are in your field experience focus class. Focal students for this assignment are students that have “low status” among their peers.

- What behaviors and/or interactions have you noticed that indicate to you that this student has low status among his/her peers?
- How does this student perceive his/herself?
- What are this student's mathematical strengths? How is this student mathematically smart?
- How does this student participate in class? (During whole class modes such as discussions, note taking, lectures and during small group or partner work)
- What are this student's interests? Or what other previous interactions have you had this student that inform your perceptions and or ways you might scaffold their participation and learning during small group work?

Part 2: (*Developed during class session*)

Adapt/create a group worthy task (Lotan, 2003).

Describe the features of the task to justify why the task is group worthy. (*Audio record collaborative group discussions*)

- To what extent is the problem open-ended and requires complex problem solving?
- What are the multiple entry points to the task?
- What are the various ways that mathematical competence can be demonstrated within the task?
- To what extent is the task designed around a big/key mathematical idea that develops understanding and/or knowledge of significant content?
- In what ways does the task require positive interdependence as well as individual accountability?
- To what extent are the evaluation criteria for the group's product clear?

Task design rationale: (*Written during TE 804 class session*)

Describe how you designed the task to support your focal student(s) participation and learning during the lesson?

Part 3: Implementation

Implement the group worthy task in your fieldwork placement. During your implementation, video and audio record your focus group (or ask your field instruction/mentor).

Part 4: Written reflection (*Written as soon as possible after implementation while in field work setting*)

- What observations of your focus students' group did you make during the implementation of the task?
- Who was participating in what ways?
- When did you intervene (or choose not to intervene)? Why?

Part 5: Class discussion (*Audio recording during TE 804 class session*)

Choose a 3 – 4 minute clip from your video that shows differential participation in your focus student's group. Transcribe this segment. Include what students say and make any notes to describe contextual elements you find important to understanding the episode (i.e. body language, tone).

Share with your group:

- 1) How is status illustrated in this episode? What are the implications for your focus student on their opportunities for learning?
2. Brainstorm a variety of ways that you might be able to respond to this group.

Appendix B: Sample Transcript

S11: Um, so one thing about this is it was a partner quiz, so it wasn't necessarily like a full group. S10: Yeah. S11: Um, but I found out it was easier to show it and like I have other examples where it was full group, but I feel like this one was like very obvious in the dichotomy between- S10: Oh yeah, I remember that class. (laughs) S11: Um, so they ... but this is first partner quiz we've ever done, so this isn't like a normal thing. Um, and I basically gave them the option, either you can work with a partner or by yourself. If you work with a partner, it was determined by random sticks and so it was like, okay, well just whoever the student ends up with, um, I'm looking at this guy, um, here in the bottom right, um, and this girl. He's ... they're about the same as ability goes. S10: Mm-hmm (affirmative), okay. S11: He is, I would say, higher in social status, lower in math status. So ability is about the same, but socially he's, he's kinda got the ... he kinds plays up the fact that ... the jock vibe sort of thing. S10: Oh yeah, I can tell. S11: But, um, but like he's a smart kid and it's not anything about that, but, um, the big thing I was noticing, so like I go to pass out the quiz and stuff, and then like, uh, she asks like, "Oh, do you want me to collect the sticks?" And I was like, "Sure." So I think a big thing is like she doesn't mind participating in class or like being like, um, wrong or anything like that. S10: Mm-hmm (affirmative). S11: But, um, he starts looking at the quiz, basically, before she comes back. Starts underlining some things, um, and she comes back and [inaudible] kinds of flips the test or the quiz towards her and then the big like ... one of the bigger things- S10: Oh, it's you. S11: Yeah, it's me. Um, is like he's doing calculations here and like she's saying like his participation, she's been kind of over the paper the whole time, and, um, and then she asks him, like, "Oh, what's 36 divided by 4?" And he pulls out the calculator, is like plugs it in, "6.5." And then she goes, "And five times that minus four?" And he starts typing something in and he gets 28.5 and she writes it down. And then she's like, "Oh, wait. That's not right." And it comes to a point where like she just grabs the calculator out of his hand. So it'll happen in ... a second here, so ... Yeah. But like, they were kind of working together and like- S06: Just totally like- S11: And then like she does the calculations. She's like, "Oh, it's 12.5," and he's like, "Oh, I thought you meant ... I thought you meant do the multiplication and then subtract four," and, uh, she's like ... But the way she responds, she's like, "But did you even look at the equation? Like you have to subtract first." And but, um, this is kind of like how the whole interaction is.	Initial Small Story
S10: So, so it sounds like she's trying to get over him. S11: A little bit, yeah. And it's like they're both pretty level in ability, like I said before. S10: Yeah. S11: Uh, but I think the perception, again, going into that kind of that status, that perception of like, oh she participates in class more, she's more, uh- S10: Competent. S11: More competent. S10: Yeah. S11: <u>Um, and I think it's that perception that's really getting to it. And you can see he's kinda like more back and I noticed like he was picking at his fingernails, uh, and things like that and ...</u>	Remainder of S11 sharing the implementation of the group-worthy task with secondary small stories <u>underlined</u>

S10: <u>Mm-hmm (affirmative). But he did at one time lean over and try to look at the paper too, so ...</u> S11: <u>He does, he does try to do that but then like she leans forward and like covers up the paper more.</u> S10: <u>Yeah, I see that. Right there.</u> S11: <u>But, um, so like yeah, I think I noticed before like, um ... Yeah, I noticed before that he leans in with the pencil but puts his hands together and crosses his fingers and ... as he watches her writing stuff up.</u> S10: Huh. S11: Um, so I think- S10: That part- S11: The big thing here is just like body language. Uh, and I think part of that is this structure of the task, like it being framed as a quiz is one of those things where it's like, "Oh, it's important to do well on this." S10: Yeah. S11: And so it kind of stresses, um- S10: So, so what is the task itself? Like what was it? The equation they're on. S11: So it was on, um, triangle congruence, um, so we were covering, uh, side, side, side; side, angle, side; angle, side, angle. S10: Okay. S11: Uh, the congruence statements. S10: Okay. S11: Um, and- S10: So- S11: Like calculations surrounding that as well. S10: Okay. S11: So like knowing angle bisector and being able to, um ... for isosceles triangles and equilateral triangles- S10: Okay. S11: Being able to find angles and prove congruence. Um, but- S10: So there could be some drawing involved, but ... S11: <u>Mm-hmm (affirmative). But yeah, as far as in general in the class, he's a bit more of a goofball, I would say.</u> S10: <u>(laughs)</u> S11: <u>Um, he, he pretends he doesn't understand things when he does. He, uh, has fantastic responses to authentic questions. Um, and ... uh, but then he gets in the tests and the quizzes and he's like super like into it and like okay, like I can do this.</u> S10: <u>Oh, sounds ... that's definitely just social status playing a role there.</u> S11: <u>Yeah, I would say so. Uh, and he doesn't ... I would say he has kind of lower math status among his peers. Like people look at him and kind of go like, like oh, like, "What do you know about this?" Um, and uh, well, not the what do you know about this, but like, "You don't understand that," or something along those lines, you know? Just they kind of keep him down there, but I feel like he doesn't mind being down there.</u> S10: <u>Yeah, because he, he just plays the role.</u> S11: <u>Because it elevates his social status.</u> S10: <u>Yeah.</u> S11: <u>So it's like he's trading in any math status he could have-</u> S10: <u>So it's like-</u> S11: <u>For that social aspect.</u> S10: <u>Yeah. That, that ...</u> S06: <u>Like being noticed.</u> S10: <u>That's exactly what I was thinking.</u> S11: Um- S10: <u>You said he thinks the chalk is a better one than ... um, [inaudible 00:16:13] jocks are not good at academics, so maybe he's just trying to reinforce that.</u>	
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S11: <u>And, and it's not just necessarily the jock thing, I think it's, it's kind of the prankster, class clown sort of vibe. But, um, just, just the idea of him like, "Oh, you know, I know I understand this. I don't need somebody to validate that." And so, like, "I'm gonna just be ... I'm just gonna trade in this math status for more of this social status, which I value a bit more."</u> S10: <u>Okay.</u> S11: <u>Um ... And I think it shows in like group work when he does try to participate or when he does try to bring what he knows, um, to the activity. Then because he's always positioned himself as that high social status, low math status, he doesn't get as much entry into the activity. Um, but it's like he willingly does that during class discussion. He willingly does that, but then like the second it like flips and it's like, "Oh, I want to participate with this," like he's engaged, like, uh, he gets cut off in, in other ways. So like the calculator gets taken out of his hand.</u> S06: Mm-hmm (affirmative). S11: And, um ... S06: Mm-hmm (affirmative). S11: So I think just a matter of like- S10: So you intentionally let them only have one calculator per pair? S11: Mm-hmm (affirmative). S10: Okay. S11: Um, yeah. Intentionally there was one calculator per pair. I think I could change that for the future, but, um- S06: Was there a reason behind that? Behind like why you only gave one per pair? Like what ... Just curious. S10: Yeah. S11: Um, it was more for them to have ... to force them to work together rather than working individually. So- S06: Okay. S10: I think one person can have the calculator and the other person have the paper. S11: Mm-hmm (affirmative). S10: And he can swap, but you can't have both at the same time. S11: Right. S06: It's also hard to [inaudible] though. S10: I think that would be better. S11: Yeah. S06: You wanna think about that too. Is just because you say something, that doesn't mean [inaudible] follow the rules. S11: Right. S10: I know but you can- S06: <u>She tried it and then she was like, "Alright, this isn't working. I'll get the calculator."</u> S11: <u>Yeah. Um, but I think a bit thing I did need to do is like if I have a side conversation with him, like I pull him aside, and this is something that I've been thinking about and just haven't done yet, but just pulling him aside and being like, "Hey, you get this," and like validating the fact that you ... he understands the material and he understands the course stuff.</u> <u>Um, and just be like, "I just wish you like were more engaged in class with the material."</u> <u>Or like, "I wish you put that effort and made it-</u> S10: <u>More constructive.</u> S11: <u>Yeah, more constructive or, or, um, you advocated for yourself more.</u> S06: <u>Mm-hmm (affirmative).</u> S10: <u>Yeah.</u> S11: <u>Because I think you could do much better than you are if you just like ... Not necessarily much better than you are, but like, like-</u> S06: <u>It would be easier-</u> S11: <u>I feel like you would get more out of this course-</u> S06: <u>Yes.</u>	
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S11: <u>If you put that foot forward and like gave it your all, because you do understand this stuff. And just like validating that, I feel like might flip the value, like flip his internal perceptions, like want that higher math status, and so he might be okay like being more serious. Um-</u> S10: <u>But at the same time you're doing it in private, so usually the most effective is make it public.</u> S11: <u>Yeah, so I can .. I've been assigning competence to him, but he like always undercuts that.</u> S10: <u>Ah.</u> S11: <u>And he's like oh yeah, you know, jokes about it. But I feel like I need to have a more private conversation with him where it's like, you know-</u> S10: <u>So he doesn't have the audience to undercut, okay.</u> S11: <u>Yeah, just like let him know I'm being very like authentic.</u> S10: <u>Yes.</u> S11: <u>In that moment and just like you get this, and like having that validated in him, like-</u> S10: <u>Okay, yeah.</u> S11: <u>Somebody sees something in me in this course. Um, I think if I have that conversation with him, he'd probably be pushed forward.</u> S10: <u>And you haven't had that conversation yet?</u> S11: <u>Not, yet. No.</u> S10: <u>I, I think that would be a good thing to do.</u> S11: <u>I ... We just did this like last week, so ... Well, a week and a half ago.</u> S10: <u>It wouldn't hurt. Yeah, it wouldn't hurt.</u> S11: <u>Anyway, that's my student and, um-</u> S10: <u>You honestly thought it through very well. Alright. Yeah. No, I, I would go with that conversation. I think that would be a good start.</u> S11: <u>This wasn't the initial student I talked about when we were first grouping up, but that initial student I was talking about is never in class, so like I couldn't get ... Like she's been gone 80% of the class, so it's like well, I can't even ... Yeah.</u> S10: <u>Isn't there a policy where if you miss too much class you automatically ...</u> S11: <u>Nope. That's on us.</u> S10: <u>There should be. It should be.</u> S11: <u>Not at all.</u> S06: <u>Yeah.</u> S11: <u>Not at all.</u> S06: <u>Yeah.</u> S11: <u>You know, it's on us to get her caught up and she's not going to.</u> S06: <u>[inaudible] students never go to and then they give them another detention, and they don't go-</u> S11: <u>Which is great because like-</u> S06: <u>And they don't go to that detention, and then there's no like follow up. And they know that there's nothing at the end they're gonna ... If I just don't go to anything, they can't make me go to anything.</u> S10: <u>Right.</u> S06: <u>Yeah.</u> S11: <u>Okay, you want to go, S06?</u> S06: <u>Yeah.</u> S10: <u>Alright</u>	
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REFERENCES

REFERENCES

- Athanases, S. Z. (2018). Locked in sequence and stuck on skills in a college-for-all culture for urban Latinx youth. *Urban Education*, 0(0), 1–32.
<https://doi.org/10.1177/0042085918806944>
- Bakhtin, M. M. (1981). *The dialogic imagination: Four Essays*. University of Texas Press.
- Baldinger, E. M. (2017). “Maybe it’s a status problem.” Development of mathematics teacher noticing for equity. In E. O. Schack, M. H. Fisher, & J. A. Wilhelm (Eds.), *Teacher Noticing: Bridging and Broadening Perspectives, Contexts, and Frameworks* (pp. 231–249). Springer.
- Bamberg, M. (2006). Stories: Big or small - Why do we care? *Narrative Inquiry*, 16(1), 139–147. <https://doi.org/10.1075/ni.16.1.18bam>
- Bamberg, M., & Georgakopoulou, A. (2008). Small stories as a new perspective in narrative and identity analysis. *Text and Talk*, 28(3), 377–396. <https://doi.org/10.1515/TEXT.2008.018>
- Bannister, N. A. (2015). Reframing practice: Teacher learning through interactions in a collaborative group. *Journal of the Learning Sciences*, 24(3), 347–372.
- Battey, D., Bartell, T., Webel, C., & Lowry, A. (2021). Understanding the impact of racial attitudes on preservice teachers’ perceptions of children’s mathematical thinking. *Journal for Research in Mathematics Education*, 52(1), 62–93.
<https://doi.org/10.5951/jresmetheduc-2020-0207>
- Ben-Ari, R. (1997). Complex Instruction and cognitive development. In E. G. Cohen & R. A. Lotan (Eds.), *Working for equity in heterogeneous classrooms: Sociological theory into practice I* (pp. 184–195). Teachers College Press.
- Benford, R. D., & Snow, D. A. (2000). Framing processes and social movements: An overview and assessment. *Annual Review of Sociology*, 26, 611–639.
<https://doi.org/10.1146/annurev.soc.26.1.611>
- Berger, J., Wagner, D. G., & Webster, M. (2014). Expectation states theory: Growth, opportunities and challenges. In *Advances in Group Processes* (Vol. 31, Issue 2014, pp. 19–55). <https://doi.org/10.1108/S0882-614520140000031000>
- Berger, J., & Webster, M. J. (2018). Expectations, status, and behavior. In P. J. Burke (Ed.), *Contemporary social psychological theories* (2nd ed., pp. 281–314). Stanford University Press.
- Bianchi, A. J., & Shelly, R. K. (2020). Sentiments as status processes? A theoretical reformulation from the expectation states tradition. *Sociological Theory*, 38(3), 217–235.

- Bianchini, J. A. (1997). Where knowledge construction, equity, and context intersect: Student learning of science in small groups. *Journal of Research in Science Teaching*, 34(10), 1039–1065.
- Bianchini, J. A. (1999). From here to equity: The influence of status on student access to and understanding of science. *Science Education*, 83(5), 577–601.
[https://doi.org/10.1002/\(SICI\)1098-237X\(199909\)83:5<577::AID-SCE5>3.0.CO;2-F](https://doi.org/10.1002/(SICI)1098-237X(199909)83:5<577::AID-SCE5>3.0.CO;2-F)
- Bishop, J. P. (2012). “She’s Always Been the Smart One. I’ve Always Been the Dumb One”: Identities in the Mathematics Classroom. *Journal for Research in Mathematics Education*, 43(1), 34–74. <https://doi.org/10.5951/jresmetheduc.43.1.0034>
- Boaler, J. (1998). Open and Closed Mathematics: Student Experiences and Understandings. *Journal for Research in Mathematics Education*, 29(1), 41–62. <https://doi.org/10.2307/749717>
- Boaler, J. (2006). How a detracked mathematics approach promoted respect, responsibility, and high achievement. *Theory into Practice*, 45(1), 40–46.
- Boaler, J., & Staples, M. (2008). Creating mathematical futures through an equitable teaching approach: The case of Railside School. *Teachers College Record*, 110(3), 608–645.
- Bonilla-Silva, E. (2014). *Racism without racists: Color-blind racism and the persistence of racial inequality in America* (4th ed.). Rowman & Littlefield Publishers, Inc.
- Bowker, G. C., & Star, S. L. (2000). *Sorting things out: Classification and its consequences*. MIT Press. <https://doi.org/10.7326/0003-4819-135-10-200111200-00030>
- Butler, J. (1988). Performative acts and gender constitution: An essay in phenomenology and feminist theory. *Theatre Journal*, 40(4), 519–531.
- Chang-Bacon, C. K. (2022). “We sort of dance around the race thing”: Race-evasiveness in teacher education. *Journal of Teacher Education*, 73(1), 8–22.
<https://doi.org/10.1177/00224871211023042>
- Chizhik, A. W., Alexander, M. G., Chizhik, E. W., & Jeffrey, G. A. (2003). The rise and fall of power and prestige orders: Influence of task structure. *Social Psychology Quarterly*, 66(3), 303–317.
- Cohen, E. G. (1984). Talking and working together: Status, interaction, and learning. In P. L. Peterson, L. C. Wilkinson, & M. Hallinan (Eds.), *The social context of instruction: Group organization and group processes* (pp. 171–187). Academic Press, Inc.
<http://files.eric.ed.gov/fulltext/ED268075.pdf#page=50>
- Cohen, E. G. (1986). *Designing groupwork: Strategies for the heterogenous classroom*. Teachers College Press.

- Cohen, E. G. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research*, 64(1), 1–35.
- Cohen, E. G., Briggs, D., Filby, N., Chin, E., Male, M., Mata, S., McBride, S., Perez, T., Quintanar-sarellana, R., & Swanson, P. E. (2004). Teaching demanding strategies for cooperative learning: A comparative study of five teacher education programs. In E. G. Cohen, C. M. Brody, & M. Sapon-Shevin (Eds.), *Teaching cooperative learning: The challenge for teacher education* (pp. 143–165). University of New York Press.
- Cohen, E. G., & Lotan, R. A. (1995). Producing equal-status interaction in the heterogeneous classroom. *American Educational Research Journal*, 32(1), 99–120.
- Cohen, E. G., & Lotan, R. A. (1997a). Raising expectations for competence: The effectiveness of status interventions. In E. G. Cohen & R. A. Lotan (Eds.), *Working for equity in heterogeneous classrooms: Sociological theory into practice* (pp. 84–95). Teachers College Press.
- Cohen, E. G., & Lotan, R. A. (Eds.). (1997b). *Working for equity in heterogeneous classrooms: Sociological theory in practice*. Teachers College Press.
- Cohen, E. G., & Lotan, R. A. (2014). *Designing groupwork: Strategies for the heterogeneous classroom* (3rd ed.). Teachers College Press.
- Cohen, E. G., Lotan, R. A., & Catanzarite, L. (1990). Treating status problems in the cooperative classroom. In S. Sharan (Ed.), *Cooperative learning: Theory and research* (pp. 203–229). Praeger Publishers.
- Cohen, E. G., Lotan, R. A., & Holthuis, N. C. (1995). Talking and working together: Conditions for learning in Complex Instruction. In M. T. Hallinan (Ed.), *Restructuring schools: Promising practices and policies* (pp. 157–174). Plenum Press.
- Cohen, E. G., Lotan, R. A., Scarloss, B. A., & Arellano, A. R. (1999). Complex instruction: Equity in cooperative learning classrooms. *Theory Into Practice*, 38(2), 80–86.
<https://doi.org/10.1080/00405849909543836>
- Cohen, E. G., Lotan, R. A., & Whitcomb, J. A. (1992). Complex instruction in the untracked social studies classroom. In R. J. Shahl & R. L. VanSickle (Eds.), *Cooperative learning in the social studies classroom: An invitation to social study* (pp. 52–58). National Council for the Social Studies.
- Cohen, E. G., Lotan, R. A., Whitcomb, J. A., Balderrama, M. V., Cossey, R., & Swanson, P. E. (1994). Complex instruction: Higher-order thinking in heterogeneous classrooms. In Shlomo Sharan (Ed.), *Handbook of Cooperative Learning Methods* (pp. 82–96). Greenwood Press.
- Copur-Gencturk, Y., Cimpian, J. R., Lubienski, S. T., & Thacker, I. (2020). Teachers' Bias

- Against the Mathematical Ability of Female, Black, and Hispanic Students. *Educational Researcher*, 49(1), 30–43. <https://doi.org/10.3102/0013189X19890577>
- Corra, M. (2020). Inequality and multiracial gatekeeping. *Sociological Focus*, 53(3), 293–321.
- Correll, S. J., & Ridgeway, C. L. (2006). Expectation states theory. In *Handbook of Social Psychology* (pp. 29–51). https://doi.org/10.1007/0-387-36921-x_2
- Crespo, S., & Featherstone, H. (2012). Counteracting the language of math ability: Prospective teachers explore the role of status in elementary classrooms. In L. J. Jacobsen, J. Mistele, & B. Sriraman (Eds.), *Mathematics teacher education in the public interest: Equity and social justice* (pp. 125–138). Information Age Publishing, Inc.
- Crespo, S., & Harper, F. k. (2019). Learning to pose collaborative mathematics problems with secondary prospective teachers. *International Journal of Educational Research*, 1–12. <https://doi.org/10.1016/j.ijer.2019.05.003>
- Dudley, P. (2013). Teacher learning in lesson study: What interaction-level discourse analysis revealed about how teachers utilised imagination, tacit knowledge of teaching and fresh evidence of pupils learning, to develop practice knowledge and so enhance their pupils' lea. *Teaching and Teacher Education*, 34, 107–121. <https://doi.org/10.1016/j.tate.2013.04.006>
- Eckert, P. (1989). *Jocks and burnouts: Social categories and identity in the high school*. Teachers College Press.
- Edwards, A. R., Esmonde, I., Wagner, J. F., & Beattie, R. L. (2016). Learning mathematics. In R. E. Mayer & P. A. Alexander (Eds.), *Handbook of Research on Learning and Instruction* (pp. 57–80). Routledge. <https://doi.org/10.4324/9781315736419>
- Ellis, N. E., & Lotan, R. A. (1997). Teachers as learners: Feedback, conceptual understanding, and implementation. In E. G. Cohen & R. A. Lotan (Eds.), *Working for equity in heterogeneous classrooms: Sociological theory into practice* (pp. 197–208). Teachers College Press.
- Engle, R. A., Langer-Osuna, J. M., & McKinney de Royston, M. (2014). Toward a model of influence in persuasive discussions: Negotiating quality, authority, privilege, and access within a student-led argument. *Journal of the Learning Sciences*, 23(2), 245–268.
- Esmonde, I. (2009). Mathematics learning in groups: Analyzing equity in two cooperative activity structures. *Journal of the Learning Sciences*, 18(2), 247–284.
- Esmonde, I., Brodie, K., Dookie, L., & Takeuchi, M. (2009). Social identities and opportunities to learn: Student perspectives on group work in an urban mathematics classroom. *Journal of Urban Mathematics Education*, 2(2), 18–45.
- Fairclough, N. (2013). Critical discourse analysis. *The Routledge Handbook of Discourse*

- Analysis*, 9–20. <https://doi.org/10.4324/9780203809068-8>
- Featherstone, H., Crespo, S., Jilk, L. M., Oslund, J. A., Parks, A. N., & Wood, M. B. (2011). *Smarter together! Collaboration and equity in the elementary math classroom*. NCTM.
- Fendler, L. (2010). *Michel Foucault*. Bloomsbury Publishing.
- Ferguson, A. A. (2000). *Bad boys: Public schools in the making of Black masculinity*. The University of Michigan Press.
- Fisk, S. R., & Ridgeway, C. L. (2018). Framing gender. In B. J. Risman, C. Froyum, & W. J. Scarborough (Eds.), *Handbook of the Sociology of Gender* (pp. 157–171). Springer. https://doi.org/10.1007/978-3-319-76333-0_12
- Foucault, M. (1972). The discourse on language. In *Archaeology of Knowledge* (pp. 215–237). Pantheon Books.
- Foucault, M. (1978). *The history of sexuality: Volume I: An introduction*. Random House, Inc.
- Foucault, M. (1980). Truth and power. In C. Gordon (Ed.), *Power/knowledge: Selected interviews and other writings: 1972-1977* (pp. 109–133). Pantheon Books.
- Frankenberg, R. (1993). *White women, race matters: The social construction of whiteness*.
- Gee, J. P. (2008). A sociocultural perspective on opportunity to learn. In P. Moss (Ed.), *Assessment, Equity, and Opportunity to Learn* (pp. 76–108). Cambridge University Press. <https://doi.org/10.1017/CBO9780511802157.004>
- Georgakopoulou, A. (2007). *Small stories, interaction and identities*. John Benjamins Publishing Company.
- Goffman, E. (1959). *The presentation of self in everyday life*. Doubleday.
- Goffman, E. (1967). *Interaction ritual*. Anchor Books.
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Harvard University Press.
- Goodwin, C. (1994). Professional vision. *American Anthropologist*, 96(3), 606–633.
- Gresalfi, M. S. (2009). Taking up opportunities to learn: Constructing dispositions in mathematics classrooms. *Journal of the Learning Sciences*, 18(3), 327–369.
- Hacking, I. (1986). Making up people. In T. C. Heller, M. Sosna, & D. E. Wellbery (Eds.), *Reconstructing individualism: Autonomy, individuality, and the self in western thought* (pp. 223–236). Stanford University Press.

- Hacking, I. (1999). Are you a social constructionist? *Lingua Franca*, 9(4), 65–72.
- Hacking, I. (2007). Kinds of people: Moving targets. *Proceedings of the British Academy*, 151, 285–318. <https://doi.org/10.5871/bacad/9780197264249.003.0010>
- Hand, V. M. (2012). Seeing culture and power in mathematical learning: Toward a model of equitable instruction. *Educational Studies in Mathematics*, 80(1), 233–247.
- Hand, V. M., Penuel, W. R., & Gutiérrez, K. D. (2012). (Re)Framing educational possibility: Attending to power and equity in shaping access to and within learning opportunities. *Human Development*, 55(5–6), 250–268. <https://doi.org/10.1159/000345313>
- Harper, F. (2019). Collaboration and Critical Mathematical Inquiry: Negotiating Mathematics Engagement, Identity, and Agency. *Occasional Paper Series*, 2019(41), 5.
- Hatt, B. (2012). Smartness as a cultural practice in schools. *American Educational Research Journal*, 49(3), 438–460. <https://doi.org/10.3102/0002831211415661>
- Heinich, N. (2019). The reception of Erving Goffman’s Frame Analysis in the United States. *Revue Francaise de Sociologie (Translated by L. Garnier)*, 60(2), 225–238. <https://doi.org/10.3917/rfs.602.0225>
- Horn, I. S. (2007). Fast kids, slow kids, lazy kids: Framing the mismatch problem in mathematics teachers’ conversations. *The Journal of the Learning Sciences*, 16(1), 37–79.
- Horn, I. S. (2008). Turnaround students in high school mathematics: Constructing identities of competence through mathematical worlds. *Mathematical Thinking and Learning*, 10(3), 201–239. <https://doi.org/10.1080/10986060802216177>
- Horn, I. S. (2012). *Strength in numbers: Collaborative learning in secondary mathematics*. NCTM.
- Horn, I. S. (2017). *Motivated: Designing math classrooms where students want to join in*. Heinemann.
- Ives, D., & Juzwik, M. M. (2015). Small stories as performative resources: An emerging framework for studying literacy teacher identity. *Linguistics and Education*, 31, 74–85. <https://doi.org/10.1016/j.linged.2015.05.004>
- Jilk, L. M. (2016). Supporting teacher noticing of students’ mathematical strengths. *Mathematics Teacher Educator*, 4(3), 188–199. <https://doi.org/10.5951/mathteaceduc.4.2.0188>
- Johnson, D. W., & Johnson, R. T. (1999). Making cooperative learning work. *Theory into Practice*, 38(2), 67–73.
- Johnson, D. W., Johnson, R. T., & Roseth, C. (2010). Cooperative learning in middle schools:

- Interrelationship of relationships and achievement. *Middle Grades Research Journal*, 5(1), 1–18.
- Johnstone, B. (2018). *Discourse analysis* (3rd ed.). Wiley-Blackwell.
<https://doi.org/10.1155/2010/706872>
- Jørgensen, M., & Phillips, L. (2002). Discourse analysis as theory and method. In *Discourse analysis as theory and method*. SAGE Publications Inc.
<https://doi.org/10.4135/9781849208871>
- Jungwirth, H. (1996). Symbolic interactionism and ethnomethodology as a theoretical framework for the research on gender and mathematics. In G. Hanna (Ed.), *Towards gender equity in mathematics education: An ICMI study* (pp. 49–70). Springer.
<http://ebookcentral.proquest.com/lib/michstate-ebooks/detail.action?docID=3035569>.
- Juzwik, M. M. (2011). Exploring cultural complexity in teacher education through interactional and critical study of classroom narratives. In L. Rex & M. M. Juzwik (Eds.), *Narrative discourse analysis for teacher educators: Managing cultural differences in classrooms* (pp. 105–130). Hampton Press, Inc.
- Kalkhoff, W., Melamed, D., Pollock, J., Miller, B., Overton, J., & Pfeiffer, M. (2020). Cracking the black box: Capturing the role of expectation states in status processes. *Social Psychology Quarterly*, 83(1), 26–48. <https://doi.org/10.1177/0190272519868988>
- Kalkhoff, W., & Thye, S. R. (2006). Expectation states theory and research: New observations from meta-analysis. *Sociological Methods and Research*, 35(2), 219–249.
<https://doi.org/10.1177/0049124106290311>
- Kirchgasler, C. (2018). True grit? Making a scientific object and pedagogical tool. *American Educational Research Journal*, 55(4), 693–720.
- Langer-Osuna, J. M. (2011). How Brianna became bossy and Kofi came out smart: Understanding the trajectories of identity and engagement for two group leaders in a project-based mathematics classroom. *Canadian Journal of Science, Mathematics and Technology Education*, 11(3), 207–225.
- Langer-Osuna, J. M. (2017). Authority, identity, and collaborative mathematics. *Journal for Research in Mathematics Education*, 48(3), 237–247.
- Langer-Osuna, J. M. (2018). Productive disruptions: Rethinking the role of off-task interactions in collaborative mathematics learning. *Education Sciences*, 8(2), 87–97.
- Lesko, N. (2012). *Act your age!: A cultural construction of adolescence* (2nd ed.). Routledge.
- LópezLeiva, C. A., & Khisty, L. L. (2014). “Juntos pero no revueltos”: Microaggressions and language in the mathematics education of non-dominant Latinas/os. *Mathematics Education*

- Research Journal*, 26(2), 421–438.
- Lotan, R. A. (2003). Group-worthy tasks. *Educational Leadership*, 60(6), 72–75.
<http://jan.ucc.nau.edu/~coesyl-p/principle6-article4.pdf>
- Lotan, R. A. (2006). Teaching teachers to build equitable classrooms. *Theory into Practice*, 45(1), 32–39.
- Lotan, R. A. (2008). Developing language and mastering content in heterogeneous classrooms. In R. M. Gillies, A. F. Ashman, & J. Terwel (Eds.), *The Teacher's Role in Implementing Cooperative Learning in the Classroom* (pp. 184–200). Springer.
https://doi.org/10.1007/978-0-387-70892-8_9
- Lotan, R. A., & Benton, J. (1990). Finding out about complex instruction: Teaching math and science in heterogeneous classrooms. In N. Davidson (Ed.), *Cooperative learning in mathematics: A handbook for teachers* (pp. 47–75). Addison-Wesley Publishing Company, Inc.
- Lotan, R. A., Bianchini, J. A., & Holthuis, N. C. (1996). Complex instruction in the science classroom: The human biology curriculum in action. In R. J. Stahl (Ed.), *Cooperative learning in science: A handbook for teachers* (pp. 331–354). Innovative Learning Publications.
- Lotan, R. A., Cohen, E. G., & Morphew, C. (1998). Beyond the workshop: Evidence from complex instruction. In C. M. Brody & N. Davidson (Eds.), *Professional Development for Cooperative Learning: Issues and Approaches* (pp. 123–145). SUNY Press.
- Louie, N. L. (2016). Tensions in equity- and reform-oriented learning in teachers' collaborative conversations. *Teaching and Teacher Education*, 53, 10–19.
- Louie, N. L. (2017a). Culture and ideology in mathematics teacher noticing. *Educational Studies in Mathematics*, 1–15.
- Louie, N. L. (2017b). The culture of exclusion in mathematics education and its persistence in equity-oriented teaching. *Journal for Research in Mathematics Education*, 48(5), 488–519.
<https://doi.org/10.5951/jresmetheduc.48.5.0488>
- Louie, N. L., Adiredja, A. P., & Jessup, N. (2021). Teacher noticing from a sociopolitical perspective: the FAIR framework for anti-deficit noticing. *ZDM - Mathematics Education*, 53(1), 95–107. <https://doi.org/10.1007/s11858-021-01229-2>
- McCall, G. J. (2018). Symbolic interaction framework. In P. J. Burke (Ed.), *Contemporary social psychological theories* (2nd ed., pp. 5–28). Stanford University Press.
- McDuffie, A. R., Foote, M. Q., Bolson, C., Turner, E. E., Aguirre, J. M., Bartell, T. G., Drake, C., & Land, T. (2014). Using video analysis to support prospective K-8 teachers' noticing

- of students' multiple mathematical knowledge bases. *Journal of Mathematics Teacher Education*, 17, 245–270.
- McDuffie, A. R., Foote, M. Q., Drake, C., Turner, E. E., Aguirre, J. M., Bartell, T. G., & Bolson, C. (2014). Use of video analysis to support prospective K—8 teachers' noticing of equitable practices. *Mathematics Teacher Educator*, 2(2), 108–140.
- Mendick, H. (2006). *Masculinities in mathematics*. McGraw-Hill Education.
- Middleton, J., Jansen, A., & Goldin, G. A. (2017). The complexities of mathematical engagement: Motivation, affect, and social interactions. In J. Cai (Ed.), *Compendium for Research in Mathematics Education* (pp. 667–699). NCTM.
- Nasir, Na'ilah Suad, Cabana, C., Shreve, B., Woodbury, E., & Louie, N. (2014). *Mathematics for equity: A framework for successful practice* (Na'ilah Suad Nasir, C. Cabana, B. Shreve, E. Woodbury, & N. Louie (Eds.)). Teachers College Press.
- Noddings, N. (1989). Theoretical and practical concerns about small groups in mathematics. *The Elementary School Journal*, 89(5), 606–623.
- Nolan, K. (2012). Dispositions in the field: Viewing mathematics teacher education through the lens of Bourdieu's social field theory. *Educational Studies in Mathematics*, 80(1–2), 201–215. <https://doi.org/10.1007/s10649-011-9355-9>
- Oslund, J. A. (2016). After the elementary mathematics teacher workshop: Stories of becoming complex instruction teachers. *Elementary School Journal*, 116(3), 437–458. <https://doi.org/10.1086/684941>
- Parks, A. N. (2008). Messy learning: Preservice teachers' lesson-study conversations about mathematics and students. *Teaching and Teacher Education*, 24, 1200–1216.
- Parks, A. N. (2010). Metaphors of hierarchy in mathematics education discourse: The narrow path. *Journal of Curriculum Studies*, 42(1), 79–97. <https://doi.org/10.1080/00220270903167743>
- Pascoe, C. J. (2007). *Dude, you're a fag: Masculinity and sexuality in high school*. University of California Press.
- Persson, A. (2019). *Framing social interaction: Continuities and cracks in Goffman's frame analysis*. Routledge.
- Pescarmona, I. (2010). Complex Instruction: Managing professional development and school culture. *Intercultural Education*, 21(3), 219–227.
- Pescarmona, I. (2014). Learning to participate through Complex Instruction. *Intercultural Education*, 25(3), 187–196. <https://doi.org/10.1080/14675986.2014.905360>

- Pescarmona, I. (2015). Status problem and expectations of competence: a challenging path for teachers. *Education 3-13*, 43(1), 30–39. <https://doi.org/10.1080/03004279.2015.961691>
- Ridgeway, C. L. (2015). Status construction theory. In G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology* (pp. 1–4). John Wiley and Sons Ltd. <https://doi.org/10.1002/9781405165518.wbeoss257.pub2>
- Ridgeway, C. L. (2018). Status construction theory. In P. J. Burke (Ed.), *Contemporary social psychological theories* (pp. 315–339). Stanford University Press.
- Ridgeway, C. L. (2019). *Status: Why is it everywhere? Why does it matter?* The Russell Sage Foundation.
- Ridgeway, C. L., & Correll, S. J. (2006). Consensus and the creation of status beliefs. *Social Forces*, 85(1), 431–453. <https://doi.org/10.1353/sof.2006.0139>
- Rymes, B., & Wortham, S. (2011). Concepts and methods for using narrative in teacher education. In L. Rex & M. M. Juzwik (Eds.), *Narrative discourse analysis for teacher educators: Managing cultural differences in classrooms* (pp. 37–54). Hampton Press, Inc.
- Schiera, A. J. (2021). Seeking convergence and surfacing tensions between social justice and core practices: Re-presenting teacher education as a community of praxis. *Journal of Teacher Education*, 72(4), 462–476. <https://doi.org/10.1177/0022487120964959>
- Schoenfeld, A. H. (2018). Video analyses for research and professional development: The teaching for robust understanding (TRU) framework. *ZDM - Mathematics Education*, 50(3), 491–506. <https://doi.org/10.1007/s11858-017-0908-y>
- Sengupta-Irving, T., & Vossoughi, S. (2019). Not in their name: Re-interpreting discourses of STEM learning through the subjective experiences of minoritized girls. *Race Ethnicity and Education*, 22(4), 479–501. <https://doi.org/10.1080/13613324.2019.1592835>
- Shah, N. (2017). Race, ideology, and academic ability: A relational analysis of racial narratives in mathematics. *Teacher College Record*, 119(7), 1–42.
- Shah, N., & Coles, J. A. (2020). Preparing teachers to notice race in classrooms: Contextualizing the competencies of preservice teachers with antiracist inclinations. *Journal of Teacher Education, Advance online*. <https://doi.org/10.1177/0022487119900204>
- Shah, N., Cosby, M. D., Goffney, I. M., Kalinec-Craig, C., Wood, M. B., Hand, V., & Crespo, S. (2021). “Bossy,” “boy,” and “urban”: Troubling coded language in mathematics education research. In J. M. Langer-Osuna & N. Shah (Eds.), *Making visible the invisible: The promise and challenges of identity research in mathematics education (JRME Monograph 17)* (pp. 13–32). NCTM.
- Shah, N., & Crespo, S. (2018). Cultural narratives and status hierarchies: Tools for identifying

- and disrupting inequity in mathematics classroom interaction. In R. Hunter, M. Civil, B. A. Herbel-Eisenmann, N. Plana, & D. Wagner (Eds.), *Mathematical discourse that breaks barriers and creates space for marginalized learners* (pp. 23–37). Sense Publishers.
- Shalaby, C. (2017). *Troublemakers: Lessons in freedom from young children at school*. The New Press.
- Sherin, B. L., & Star, J. R. (2011). Reflections on the study of teacher noticing. In M. G. Sherin, V. R. Jacobs, & R. A. Phillip (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes* (pp. 66–78). Routledge.
- Sherin, M. G., Jacobs, V. R., & Philipp, R. A. (Eds.). (2011). *Mathematics teacher noticing: Seeing through teachers' eyes*. Routledge.
- Simpson, B., & Walker, H. A. (2002). Status characteristics and performance expectations: A reformulation. *Sociological Theory*, 20(1), 24–40.
- Souto-Manning, M. (2006). Education for democracy: The text and context of Freirean culture circles in Brazil. In B. A. Levison & D. Stevick (Eds.), *Reimagining civic education: How diverse societies form democratic citizens* (pp. 121–145). Rowman & Littlefield Publishers, Inc.
- Souto-Manning, M. (2014). Critical narrative analysis: The interplay of critical discourse and narrative analyses. *International Journal of Qualitative Studies in Education*, 27(2), 159–180. <https://doi.org/10.1080/09518398.2012.737046>
- Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology*, 35, 4–28. <https://doi.org/10.1006/jesp.1998.1373>
- Stein, M. K., Smith, M. S., Henningsen, M. A., & Silver, E. A. (2000). *Implementing standards-based mathematics instruction: A casebook for professional development*. Teachers College Press.
- Sun, K. L. (2018). The role of mathematics teaching in fostering student growth mindset. *Journal for Research in Mathematics Education*, 49(3), 330–355.
- Swanson, P. E. (1997). Linking sociological theory to practice: An intervention in preservice teaching. In E. G. Cohen & R. A. Lotan (Eds.), *Working for equity in heterogeneous classrooms: Sociological theory into practice* (pp. 240–259). Teachers College Press.
- Takeuchi, M. A. (2016). Friendships and group work in linguistically diverse mathematics classrooms: Opportunities to learn for English language learners. *Journal of the Learning Sciences*, 25(3), 411–437. <https://doi.org/10.1080/10508406.2016.1169422>
- Taylor, V. J., & Walton, G. M. (2011). Stereotype threat undermines academic learning.

- Personality and Social Psychology Bulletin*, 37(8), 1055–1067.
<https://doi.org/10.1177/0146167211406506>
- Thye, S. R., Willer, D., & Markovsky, B. (2006). From status to power: New models at the intersection of two theories. *Social Forces*, 84(3), 1471–1495.
<https://doi.org/10.1353/sof.2006.0070>
- Tsu, R., Lotan, R. A., & Cossey, R. (2014). Building a vision for equitable learning. In Na'ilah Suad Nasir, C. Cabana, B. Shreve, E. Woodbury, & N. Louie (Eds.), *Mathematics for equity: A framework for successful practice* (pp. 129–143). Teachers College Press.
- Turner, E. E., Drake, C., McDuffie, A. R., Aguirre, J., Bartell, T. G., & Foote, M. Q. (2012). Promoting equity in mathematics teacher preparation: A framework for advancing teacher learning of children's multiple mathematics knowledge bases. *Journal of Mathematics Teacher Education*, 15(1), 67–82.
- Vakil, S., & McKinney de Royston, M. (2019). Exploring politicized trust in a racially diverse computer science classroom. *Race Ethnicity and Education*, 22(4), 545–567.
- Valera, S., & Takeuchi, M. A. (2018). Students' identities and collaboration in mathematics group work. *Paper Presented at the Annual Conference of Canadian Society for the Study of Education*.
- van Es, E. A., Hand, V. M., Agarwal, P., & Sandoval, C. (2022). Multidimensional noticing for equity: Theorizing mathematics teachers' systems of noticing to disrupt inequities. *Journal for Research in Mathematics Education*, 52(2), 114–132. <https://doi.org/10.1016/B978-0-08-097086-8.92048-8>
- van Es, E. A., & Sherin, M. G. (2002). Learning to notice: Scaffolding new teachers' interpretation of classroom interactions. *Journal of Technology and Teacher Education*, 10(4), 571–596.
- Walshaw, M. (2001). A Foucauldian gaze on gender research: What do you do when confronted with the tunnel at the end of the light? *Journal for Research in Mathematics Education*, 32(5), 471–492. <https://doi.org/10.2307/749802>
- Watanabe, M. (2012). *"Heterogonius" classrooms: Detracking math and science: A look at groupwork in action*. Teachers College Press.
- Weber, M. (2009). *From Max Weber: Essays in sociology* (H. H. Gerth & C. Wright Mills (Eds.)). Routledge.
- Wilson, J., Nazemi, M., Jackson, K. J., & Garrison, A. (2019). Investigating teaching in conceptually oriented mathematics classrooms characterized by african American student success. *Journal for Research in Mathematics Education*, 50(4), 362–400.
<https://doi.org/10.5951/jresmetheduc.50.4.0362>

Wood, M. B. (2013). Mathematical micro-identities: Moment-to-moment positioning and learning in a fourth-grade classroom. *Journal for Research in Mathematics Education*, 44(5), 775–808.

Wortham, S. (2006). *Learning identity: The joint, local emergence of social identification and academic learning*. Cambridge University Press.