Teacher and Student Perceptions of Student Engagement in a 9th Grade Classroom

Kathryn Field
University of Connecticut - Storrs, katyfield3@gmail.com

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Student engagement is integral to the process of learning. Teacher moves, or the behaviors that teachers enact in the process of teaching, have been shown to influence students’ engagement. Research indicates that students are more likely to engage in learning when they believe their teacher supports student autonomy, competence, and relatedness. Less is known about the precise types of moves that engender these feelings in students and how teacher-student relationships play a unique role in student engagement. In this qualitative case study, I studied teacher and student perceptions of the engagement process and teacher-student relationships in a naturally occurring, ninth-grade classroom.

Findings support previous self-determination literature on how student engagement unfolds in the classroom. However, the data indicate that the current definitions of teacher moves may be too limited to capture the full range of actions that inspire feelings of autonomy, competence, relatedness in students. Of particular importance, teacher moves that inhibited feelings of competence included moves associated with under-stimulation for students.

The data from this study also provide evidence for a more nuanced conceptualization of the role that teacher-student relationship building plays in the process of student engagement. When discussing the teacher’s effect on their engagement, some students discussed relatedness moves more frequently than others, indicating a personality type that was more attune to noting the role of teacher-student relationships in the students’ engagement. Additionally, when there
were differences between the teacher and students’ perceptions of the teachers influence on student engagement, students frequently commented on teacher-student relationship building.
Teacher and Student Perceptions of Student Engagement in a 9th Grade Classroom

Kathryn Sarah Field

B.A., Dartmouth College, 2001

M.Ed., University of Illinois, 2011

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

at the

University of Connecticut

2018
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Kathryn Sarah Field

2018
Teacher and Student Perceptions of Student Engagement in a 9th Grade Classroom

Presented by
Kathryn Sarah Field, B.A., M.Ed.

Major Advisor: ____________________________
Dr. Catherine A. Little

Associate Advisor: ____________________________
Dr. Ronald A. Beghetto

Associate Advisor: ____________________________
Dr. E. Jean Gubbins

Associate Advisor: ____________________________
Dr. Mary P. Truxaw

Associate Advisor: ____________________________
Dr. Suzanne M. Wilson

University of Connecticut
2018
ACKNOWLEDGEMENTS

To Josh: without your kindness, good will, generosity, and curiosity, none of this would have been possible. My gratitude is immeasurable.

To all of my participants: I am forever grateful for the gifts of time and thoughtfulness you shared with me. Thank you for talking with me and letting me explore your world.

To my former teachers and students: I am thankful for all of the inspiration you have given me. This phase of my educational journey has tested my creativity, problem-solving, curiosity, discipline, articulation, perseverance, flexibility, and confidence. You helped me strengthen and deepen the wellsprings of these resources so that I had enough to draw from. Specifically, in memory of Julia Wu Trethaway: thank you for your open mind and heart. I would not be here today without your mentorship and encouragement to use my voice.

To my family: thank you for celebrating the value of education and cultivating within me a work ethic that has served me well. Whenever I have felt like I was slipping backwards, I have been reminded of the imperative to “move those little legs” and persist onward. Thank you for nurturing the independence I needed to explore and learn.

To my committee: Ron, thank you for helping me discern possibilities and energizing my work with new ideas. Suzanne, thank you for challenging me to complicate my thinking and simplify my writing. Jean, thank you for encouraging my work and coaching me toward a more professional voice. Mary, thank you for inviting encores and offering thoughtful cues when my thinking was still in its rehearsal stages.

To my advisor: Catherine, my gratitude for your gifts is great. If staying engaged in learning requires autonomy, you supported my choices—even when they took me down the road less traveled. If staying engaged in learning requires competence, you offered me feedback full
of affirmation and complication—which helped me stay optimally challenged throughout the dissertation process. If staying engaged in learning requires relatedness, you made me feel seen and heard by offering me the gifts of your time, patience, mentorship, reliability, and compassion. Thank you for letting me wander when I got curious and meeting me with a compass when I ventured too far afield. Above all, thank you for not letting me lose sight of my North Star: my love of teaching. You helped me keep one eye fixed on that North Star as I navigated the constellation of the research universe. In some ways, this doctoral journey has brought me back to where I started. However, I feel like I am returning to the classroom with more Cairns on my map. You treated me with dignity and respect as both a learner and a teacher. I hope I can pay forward all the courtesies you have shown me as my educational journey continues.

To my friends: Rebecca, thank you for offering me friendship as a fellow traveller on this road. We may have different destinations, but you know the contours of the terrain I’ve had to traverse better than anyone else. How lucky I am that our paths crossed. UConn has left its mark on my mind, but you have left yours on my heart. Donna, thank you for being a source of support through this dissertation journey, just as you have been through so many other journeys in my life. You have been three wise women in one: when I feel too big, you bring me humility; when I feel too small, you bring me courage; and when I feel like there is no way around the challenges on my path except to go through them, you bring me humor.

To my wife: Katie, thank you for being my faithful companion. I am blessed by the fact that you are always willing to travel with me down every “why” and “what if.” Writing this dissertation and finding my way in the world of academia have brought me into places of uncertainty. You have walked those gaps with me. You have been a sounding board, an editor, a
task-master, and a cheerleader. You have patiently watered every seed I felt the need to sow along the way; and when I got lost in the weeds, you waited for me to re-emerge on the other side. Most of all, even though I seem to have been persistent in making the process more complicated than it needed to be you have loved me through it. This work could not have come to fruition without you.
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CHAPTER 1
INTRODUCTION

Whether they zone out, act out, or drop out, there are students who fail to live up to their potential everyday because engagement in learning proves elusive. The conceptualization and formal study of student engagement in learning in the field of educational psychology began in the early 1990s. Interest in this topic rose in the wake of the *Nation at Risk* report (National Commission on Excellence in Education [NCEE], 1983). This report raised concerns over dropout rates and underperforming schools, and engagement was seen as part of the prescription that could help cure these ills (Newmann & Wehlage, 1995). Student engagement refers to a student’s active participation in, investment in, and commitment to learning (Deakin Crick, 2012; Fredricks, Blumenfeld, & Paris, 2004; Newmann, Wehlage, & Lamborn, 1992). Some have also referred to it as energy in action and emphasized the aspect of activity as a way of distinguishing engagement and motivation as separate constructs (Ainley, 2012; Connell, 1990; M. A. Lawson & H. A. Lawson, 2013; Skinner & Pitzer, 2012; Wellborn, 1992).

There have been a number of different approaches to studying engagement in learning, and there is consequently a dearth of agreed-upon language for how to conceptualize engagement for research purposes. While cognitive researchers tend to use the word engagement, sociocultural researchers tend to use the term participation when describing the same process (Hickey & Granade, 2004). From a sociocultural point of view, a student’s active participation is a requisite component of learning (Hickey & Granade, 2004; McCaslin, 2009; Rogoff, 1990; Vygotsky, 1978; Yowell & Smylie, 1999). From a cognitive perspective, engagement is the active process that mediates between a student’s academic experience and his or her achievement (Connell & Wellborn, 1991; Finn, 1989, 1993; Finn & Rock, 1997; Fredricks, et al., 2004;
Thus, regardless of the theoretical perspective, sociocultural and cognitive researchers seem to agree that student engagement—encompassing active student participation in academic tasks—is necessary for students to experience positive learning outcomes.

**Statement of the Problem**

Engagement is distinct from traditional curricula and pedagogy planning. Student engagement mediates the relationship between the quality of lessons that teachers deliver and students’ levels of achievement (Guthrie & Wigfield, 2000). Organized, concept-driven content presentations and accurate skill scaffolding are not enough to transform potential into achievement, even for the most talented students (Csikszentmihalyi, 1990; Csikszentmihalyi, Rathunde, & Whalen, 1997). Students need to be motivated and engaged to take advantage of the learning opportunities around them, and not all students utilize their opportunities to the fullest potential. Underachievement is a problem (McCoach & Siegle, 2003; Reis & McCoach, 2000), and talent will not automatically manifest itself just because a student has potential (Dweck, 2012; Moon, 2003; Subotnik, Olszewski-Kubilius, & Worrell, 2011). Thus, educators must attend to engagement to help bridge the gap between curricula and achievement.

Engagement is integral to promoting academic achievement. In studies with elementary school students (Connell & Wellborn, 1991; Klem & Connell, 2004; Ladd, Birch, & Buhs, 1999; Ladd & Dinella, 2009; Skinner et al., 1990) researchers found that early engagement in school predicted greater gains in academic achievement later on. Similar but fewer results have been found for secondary students (Connell & Wellborn, 1991; Jang, Kim, & Reeve, 2012; Newmann et al., 1992; National Research Council & Institute of Medicine [NRCIM], 2004). Additional studies on both elementary and high school students have demonstrated the reverse effect as
well—that disengagement and disaffection predict lower academic achievement and dropping out (Finn, Pannozzo, & Voelkl, 1995; Finn & Rock, 1997).

The development of potential into achievement at the highest levels requires engagement that is driven by a student’s feeling of control over his/her choice to engage. In their mega model for talent development, Subotnik et al. (2011) suggested that talent is not an innate trait that some students possess and others do not. They proposed that talent could be developed from its inception as un-materialized potential into achievement and, later, into eminence. Subotnik and her colleagues also suggest that teachers can help nurture this development, in part, by cultivating psychosocial factors, such as optimal motivation. Other models of achievement (Siegle, 2013) also illustrate that context matters in transforming potential to achievement. In the achievement-orientation model, the environment influences a student’s motivational beliefs, and motivational beliefs interact with a student’s ability level to shape one’s engagement and achievement.

The type of thinking and learning needed for the development of talent at its highest potential is best supported by engagement that co-occurs with motivational-orientations in which the student feels in control of his or her choice to engage. In his three-ring conception of giftedness, Renzulli (2005) proposed that creative productivity is a valuable form of learning toward which we should encourage the development of talent in our society. Creative productivity emerges from the confluence of above average ability, task commitment, and creativity, within an environment that nurtures their development. Task commitment, much like the construct of motivation itself, is the energy one brings to a learning task (Renzulli, 2005). Not just any type of motivation will work to nurture creativity, however. Motivating students
extrinsically (i.e., by forces students perceive as outside of their control) actually diminishes creative thinking (Amabile, 1998).

The transition from childhood to adolescence is a particularly malleable time for student engagement. On the one hand, adolescence is a time that is ripe for students to express their personal agency and engage in learning as they explore and experiment with crafting their own identities (Klemenčič, 2015). However, it is also a time when teachers are competing with more people, activities, and opportunities for a student’s engagement (Newmann et al., 1992). Sadly, students’ motivation for school declines between third and tenth grades (Harter, 1981; Lepper, Corpus, & Iyengar, 2005; Otis, Grouzet, & Pelletier, 2005), and when motivation for school declines, so does a student’s engagement (NRCIM, 2004). Researchers have found that students’ preference for challenge and their curiosity drop as they approach and enter high school, as well (Harter, 1981). Furthermore, students who see themselves as highly academically capable in late elementary school often experience even bigger drops in engagement in conceptual learning than their less self-assured counterparts as they enter middle and high school (Veiga, Garcia, Reeve, Wentzel, & Garcia, 2015). Exacerbating the problem, teachers are also less able to accurately predict the levels of interest and effort that students report to be putting into the learning process—and this understanding gap grows as students progress through high school (Lee & Reeve, 2012). Thus, understanding contextual factors that can inhibit and facilitate academic engagement for teenagers could help educators to support the cultivation of engagement and subsequent talent development throughout adolescence.

Purpose of the Study

For the purposes of this study, I adopted the framework of the self-systems model of motivational development within self-determination theory. A core assumption of self-
determination theory is that humans are active agents who have a natural tendency toward growth and development (Deci & Ryan, 1985; Ryan & Deci, 2000). However, self-determination researchers also proposed that the environment—specifically, our social contexts—can either support or thwart these natural tendencies (Deci & Ryan, 1985; Ryan & Deci, 2000, 2002). Similar to Maslow’s (1943) hierarchy of needs, Deci and Ryan have argued that all humans have basic psychological needs that, when nurtured by the environment, facilitate a person’s natural tendencies towards curiosity, learning, and growth. Just like our biological development and functioning are facilitated by tending to our physiological needs, our cognitive development and growth are facilitated by tending to psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2002). Autonomy refers to the feeling of having choices and being able to align one’s actions to one’s goals and values. Competence refers to the feeling of being capable of producing certain outcomes. Relatedness refers to the feeling of being socially connected and valuable to others (Connell, 1990; Deci & Ryan, 1985).

The self-systems model for motivational development uses self-determination theory to propose a model for talent development that focuses on the process of how and why students come to engage in learning. According to the self-systems model of motivational development (Connell & Wellborn, 1991; Skinner et al., 1990), learning is a contextualized process with four parts: part one, the environmental context, influences a student’s feelings about herself (i.e., feelings of psychological needs fulfillment and subsequent motivation); part two, one’s self-feelings, influences one’s activity (i.e., engagement in learning or lack thereof); part three, one’s engagement, influences academic outcomes; this all results in part four, the positive academic outcomes. When the learning environment helps to fulfill psychological needs, students develop motivation that feels more autonomously driven, which then influences their choices to engage in
learning. For the purposes of this study, I will explore this type of autonomously-motivated engagement. Self-determination theorists recognize that there are other types of motivation that can compel engagement, but when motivation is elicited through more extrinsic means and the environment is not supportive of psychological needs, the resultant engagement is referred to as control-motivated engagement.

**Autonomously-Motivated Engagement**

Students benefit more from autonomously-motivated forms of engagement than from control-motivated forms of engagement. This type of student engagement has been linked to “greater flexibility in problem solving, more efficient knowledge acquisition, and a strong sense of personal worth and social responsibility” (Deci, Vallerand, Pelletier, & Ryan, 1991, pp. 325-326). Even when researchers held constant for levels of self-efficacy and competence in learning activities, students who are engaging from an autonomous perspective experience better interest, excitement, confidence, performance, persistence, creativity, vitality, self-esteem, and well-being than students who engage from a controlled perspective (Ryan & Deci, 2000). Students who engage from an autonomously-motivated perspective develop more conceptual understandings, their learning deteriorates less quickly, and they have better overall achievement than students who “learned” through control-motivated engagement (deCharms, 1976; Grolnick & Ryan, 1987). Finally, there is reason to believe that the effects of autonomously-motivated engagement sustain beyond the immediate learning experience. Students who experience autonomously-motivated engagement are more likely to be self-starters, initiating learning in their own futures (Niemiec & Ryan, 2009). Thus, it is important that educators understand how this type of engagement process develops to maximize learning, achievement, and talent development.
Teachers can support and encourage autonomously-motivated forms of engagement in their students. There have been a few intervention studies in which researchers have trained teachers in techniques that support students’ senses of autonomy (deCharms, 1976, Reeve, Jang, Carrell, Jeon, & Barch, 2004; Su & Reeve, 2011). These have all shown positive effects on students’ autonomously-motivated engagement and subsequent achievement in school. When reporting on these studies, however, researchers have remained relatively silent on what teacher behaviors really look like in lived experience. The intervention programs as described in these studies have encouraged teachers to “incorporate students’ interests, preferences, choices, curiosity, or sense of challenge into the lesson” (Reeve et al., 2004, p. 154), but they have not gone into depth about how teachers do this. Furthermore, the aforementioned intervention studies focused largely on autonomy and competence and much less so on relatedness when studying facilitative or inhibitive teacher behaviors. There is a need for more research to understand the specific types of teacher moves that students perceive as supportive of and inhibitive to their engagement. Many questions remain unanswered by the current state of the self-determination research on engagement. When and how, specifically, are teachers able to improve the ways they cultivate student engagement in learning? What are the factors at play in a classroom context, and how do teacher-student relationships evolve in ways that help the teacher to successfully facilitate students’ autonomously-motivated engagement in learning?

The research on self-determination theories of student engagement has been conducted from within a cognitive (i.e., individual) theoretical framework. While the cognitive approach has framed an interesting picture of some precursors that appear to be correlated with engagement and has linked discrete engagement elements to positive academic outcomes, the work from this perspective has yet to explain how and why particular social contexts give rise to
differing levels and qualities of engagement and how those forms of engagement change over time in response to specific contextual factors (M. A. Lawson & H. A. Lawson, 2013). Cognitive researchers have suggested that there are reciprocal and dialectical effects between student and teacher behaviors that may lead to differing effects over time, but these potential effects are under-explored and under-explained by their current models (M. A. Lawson & H. A. Lawson, 2013; Reeve & Lee, 2014; Skinner & Belmont, 1993).

Research Questions

My purpose in this study has been to describe and explain the process of student engagement in learning in a classroom—specifically autonomously-motivated engagement—and how it relates to teacher-student relationship building. Given that these processes are temporally and contextually bound, I have explored them as they evolved over time in a particular, real-life setting. The research questions that have guided my work are as follows:

1. What are teacher and student perspectives on the process of student engagement in learning in the classroom, and how is evidence of that process related to evidence of teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those changes related to the quality of teacher-student relationships in the classroom?

Study Context and Design

I conducted this qualitative study in a 9th grade science classroom over the course of the fall term in 2017. I observed and video-taped classes every day that the class met and asked students to nominate moments of high and low engagement by completing exit slips each day. Based on the data from these exit slips and from weekly 5-minute, one-on-one check-ins with students, I selected video clips from class that demonstrated possible moments of high or low
engagement (or both) from a number of students and the preceding teacher behaviors that students indicated had influenced this engagement. I used these video clips to prompt focus group discussions with the students and individual interviews with the teacher each week. The majority of the evidence that I analyzed for this study came from these weekly interviews. When I analyzed the data, I parsed out each chunk of data where one or more participants spoke in tandem about a specific type of behavior from the teacher as having a particular effect on engagement.

Teacher Moves & Conversational Turns

For the sake of efficiency and clarity, I used two terms throughout this study to help define the units of data that I analyzed. The term teacher moves refers to any verbal or physical action (or combination of the two) that the teacher enacts while interacting with students. References to teacher moves are what I listened and looked for when trying to understand the students’ and teacher’s perceptions of what influenced student engagement. The term conversational turns refers to a contiguous section of the transcription data in which one or more participants made a comment on the same type of teacher move having a particular type of effect on one or more students. Thus, for the teacher interviews, each time the teacher changed the topic, I marked a new conversational turn. With the focus group data, however, there were instances where one student made a comment and then another student agreed and/or elaborated without changing the basic meaning of the original speaker. This section of data would be unitized together as one conversational turn for the purposes of analysis.

Definitions

Engagement in Learning
In an extensive review of the literature on student engagement, Fredricks et al. (2004) distilled three different factors that encompassed all of the student engagement research that they found. These factors were behavioral—which primarily refers to participation; cognitive—which primarily refers to mental effort; and emotional—which primarily refers to interest and identification. Rarely did studies include all three factors, however. In this study, I will consider the process of how all three of these factors work together in the service of autonomously-motivated engagement.

Taken individually, none of the factors distilled in Fredricks et al. (2004) are enough to capture autonomously-motivated engagement. The idea of participation as it is captured in Fredricks et al.’s (2004) behavioral factor is necessary but not sufficient for the kind of engagement that I seek to investigate in this study. It is only when participation co-occurs with the investment, concentration, and perseverance that are indicative of cognitive engagement that conceptual learning occurs. Under the umbrella of behavioral engagement alone, students may participate mindlessly. This is less about learning and more about obedience or doing that which has already been mastered. Also under the behavioral engagement umbrella, students may participate out of a sense of coercion. This is less about learning and more about complying to achieve a different end other than internalized learning (such as parental approval or avoiding punishment). Ascertaining interest is another useful clue to help understand the level of coercion that may or may not exist, but it is not sufficient in and of itself to determine the mental activity needed for engagement in learning. A student may find something “cool” or “fun” but if he is distracted and fails to invest the effort and participation necessary to transform curiosity or entertainment into learning, then autonomously-motivated engagement in learning has not
occurred. Thus, for the purposes of this study, engagement in learning is defined as the process of developing volitional interest, effort, and participation in learning.

**Teacher-Student Relationship Building**

For the purposes of this study, teacher-student relationship building is the process wherein students develop a sense of being connected to and valued by the teacher. This definition is rooted in self-determination theory because it can be seen as the sub-process of how a teacher contributes to supporting the need for relatedness within the larger self-determination model. The teacher-student relationship building process is a social process and therefore inherently involves communication between teacher and student. For a constructive relationship to evolve, communication between teacher and student must result in the student’s perceiving the teacher as genuinely interested in the student.

**Theoretical Assumptions**

There are a number of theoretical assumptions that have undergirded this study. First and foremost, I assumed that engagement and relationship building are both contextually and temporally situated processes. Second, I assumed that students and teacher are able to reflect on their engagement and the feelings that they have about what was facilitating or inhibiting their engagement in particular instances. Third, I assumed that the engagement and relationship building processes included both intra- and inter-psychological components, and there would be both similarities and differences in how students experienced and perceived the behaviors of the teacher as they related to engagement and relationship building.

My assumption that engagement and relationship building are contextually and temporally situated processes drove the overarching design of this study. This study was a naturalistic study of one freshman classroom, and it took place from the beginning of the school
year through to the end of the first term of study. By immersing myself in one classroom, I sought to attend to and understand the nuances and particularities of one context in which engagement and relationship building occurred. Furthermore, I recognize that these processes are temporal—what happens before affects what comes next—and so by observing freshmen at the beginning of a school year, I sought to understand the evolution of teacher-student relationships as close to their inception as possible. The assumption of temporal context also led me to observe and talk with participants about the same process of engagement again and again over the course of multiple weeks to understand more about how student and teacher perceptions of the engagement process were evolving.

My assumption that teacher and students can reflect on their experiences of the processes of engagement and relationship building led me to collect myriad reflective data from them. In previous work, Skinner, Kindermann, and Furrer (2009) asserted that students are able to identify and describe when they are or are not engaged in learning. Thus, I incorporated a number of individual and—in the case of the students—small group opportunities to elicit participants’ reflections on their experiences of engagement (inclusive of relationship building) in the classroom. My ability to elicit data in temporal proximity to the actual experiences was a limitation. However, by combining written exit slips at the end of each class, individual “check-ins” every Monday night, and video-based focus groups every Thursday night, I sought to get as close as reasonably possible to the students’ experiences while also making space for more elaborate reflections that could not happen in close proximity to class time.

Finally, my assumption that engagement and relationship building included both intra- and inter-psychological processes led me to build in mechanisms for collecting data on both individual and social levels. The personally meaningful understandings that students and teacher
were developing about engagement and relationship building were based on both intra- and inter-
psychological experiences (Beghetto, 2016a, 2016b). By listening to students and the teacher
individually, I sought to understand the intra-psychological perceptions and meanings they were
taking away from the experiences they had in the shared social space of the classroom. By
observing and recording class interactions, and then using video clips of these interactions as
prompts for weekly interviews, I sought to understand the inter-psychological elements that
played salient roles in the intra-psychological meanings that the participants were constructing.
Furthermore, by conducting focus groups with subsets of the students each week, I was able to
understand more about when and how patterns emerged in shared understandings versus unique
elements of individual perceptions.
CHAPTER 2
REVIEW OF THE LITERATURE

Engagement in Learning

Researchers have struggled to develop a consensus definition for the concept of student engagement (Fredricks et al., 2004). In an attempt to find threads of commonality within the student engagement literature, Fredricks and her colleagues conducted a literature review and offered a three-part definition for engagement including behavioral, emotional, and cognitive factors. The behavioral factor refers to more concrete, observable elements such as participation in school-related activities. The emotional factor encompasses affective experiences such as a sense of identification with or belonging to school. The cognitive factor refers to the mental effort that students put forth when actively engaged in academic activities, such as concentration, investment, and perseverance. This meta-analysis provided a comprehensive and inclusive definition for the concept of engagement, but rarely have researchers used this definition comprehensively in practice.

Researchers often use different language to refer to similar concepts and privilege some factors over others in their research work. In this review, I will present commonalities in the literature in two ways. First, I will review the literature that includes social context as an explanatory factor in the process of student engagement. Second, I will review the literature in which scholars have paid particular attention to the role of teacher-student relationships in the process of engagement in learning. Finally, I will make a case for privileging the self-systems model of motivational development nested in self-determination theory as a means to explore student engagement alongside teacher-student relationship building.

Participation-Identification Model
In 1989, Finn proposed a model for student engagement as a process that develops over time and influences a student’s likelihood to complete high school. Finn lamented the fact that most of the dropout literature at the time only looked at variables that were both measured late in a student’s career and were largely nonmalleable (e.g. race and SES). In an effort to explore contextual factors that could potentially be manipulated through interventions at earlier stages in a student’s career, Finn proposed the participation-identification model. In this model, participation is defined as the behaviors associated with engagement, and identification is defined as the affective or emotional aspects of engagement. Finn categorized participatory behaviors on a four-tiered system. The first level included behaviors that indicate acquiescence with the rules and expectations of school (e.g., paying attention, following directions, showing up); the second level included behaviors that indicate student initiative (e.g., seeking help, engaging in discourse with teachers, spending extra time in the classroom or on homework); the third level included voluntary participation in extracurricular activities; and the fourth level included voluntary participation in school governance. Finn defined a student who identified with school as one who has “an internalized conception of belongingness . . . [and they] value success in school-relevant goals” (Finn, 1989, p. 123). Behavioral and emotional elements of engagement are explicitly included in Finn’s model. While not referenced explicitly, cognitive elements, such as effort and investment, are implied by the second level and the voluntary nature of the third and fourth levels of Finn’s model.

Unfortunately, even though Finn’s model proposed a multi-layered definition of engagement, rarely has this full definition been used in practice in the research studies based on this model. In a major study based on nationwide, longitudinal data of 1,803 at-risk students, Finn and Rock (1997) concluded that engagement was predictive of successful school
completion. However, the measures in this study included teacher reports of level one participation and student self-reports of a combination of levels one through three participation (although the only question that related to level two was a question about how much homework students completed each week). There were no measures of identification. In another major longitudinal study of 1,335 students, Voelkl (1997) measured identification by administering a 16-item self-report survey to students, but the only measure of participation was a 14-item teacher report that measured level one participation alone. Furthermore, data on participation and achievement were collected in grades 4, 7, and 8, but data about identification were only collected in grade 8. Thus, Voelkl concluded that participation and achievement in earlier grades was predictive of identification in a later grade, but data did not exist to provide evidence of engagement holistically across grades.

Finn (1989) also hypothesized a non-linear process in which participation, identification, and academic success influence each other. Finn’s original version of the model (1989) proposed a clockwise pattern leading from participation to successful school performance to identification and back to more participation. Ability was represented as an outside factor that could influence performance, and quality of instruction was represented as a contextual factor that could influence participation and performance. In 2012, Voelkl proposed a revised version of this model with expanded contextual factors. She proposed that students’ feelings of fairness, safety, working with like-minded peers, and having a supportive classroom were all contextual factors that influenced students’ identification with school. When discussing the factor of a supportive classroom, Voelkl acknowledged that both teacher and peers can contribute to a student’s feelings of support, but she highlighted that teachers play a unique role in creating classroom cultures. Voelkl (2012) stated that teachers encourage a supportive environment, “by showing
concern for students’ welfare and supporting their efforts, by articulating clear norms and expectations for students, and by encouraging student autonomy” (p. 205). This definition of the contextual factor of teacher support overlaps with the ways self-determination researchers have defined teacher support for engagement. Ultimately, Voelkl’s (2012) expanded model has yet to be tested thoroughly, and she concluded that, “more research is needed to understand the process by which identification becomes internalized” (p. 213).

Even though the participation-identification model includes teacher contextual factors as a component, Finn and his colleagues have not conducted as much research on these factors. Finn and Voelkl published an article in 1993 reporting on a study in which they looked at contextual factors that might influence engagement. However, in addition to only measuring level one participation, the measurement of identification (as a component of engagement in and of itself) was conflated with the supportive teacher-student relationship. In this case, a student self-report survey to measure identification included items that inquired about things such as whether teachers were interested in students, praised their efforts, or put them down along with broader items such as how much students felt a sense of school spirit. The contextual factors that were measured included demographic information (e.g., student-teacher ratio, school size, enrollment by race) and student reports on the rigidity of rules, severity of punishments, and the degree of structure within school. The researchers concluded that students were more engaged when they attended a smaller school and less engaged when they perceived rules as rigid. The conflation of factors and limited scope of the context make it hard to discern useful conclusions about the role of context in supporting engagement from Finn and Voelkl’s work.

Contextual factors were taken into account when a different set of researchers built on the participation-identification model to develop an intervention program for at-risk youth.
Researchers at the University of Minnesota (Anderson, Christenson, Sinclair & Lehr, 2004; Lehr, Sinclair, & Christenson, 2004; Reschly & Christenson, 2012) designed the Check and Connect Program based primarily on the participation-identification model. This intervention included a system in which outside mentors would “check” certain level one participation and academic indicators (e.g., attendance, reports of disruptive behavior, and poor grades) on a regular basis, and when students demonstrated signs of poor participation and/or performance, these mentors would “connect” with students and their families to encourage students to re-engage in school. The identification-building component of this intervention included long-term relationships with the same mentor; persistent positive messages of high expectations from the mentor; coaching from the mentor in how to solve problems rather than looking for blame; and consistent messages from the mentor of his or her value for both the student and school related goals.

In one study of the Check and Connect Program, Anderson et al. (2004) measured indicators of identification building to see if they had an effect on engagement, but they only collected snapshots of these processes. In an elementary school Check and Connect program targeting at-risk youth, Anderson and her colleagues studied 116 students who had been in the program for at least 20 months. They administered surveys to both students and mentors to measure the quality of relationship building. These surveys included five (mentor) or four (student) questions that asked participants to reflect on how comfortable students seemed to feel meeting and talking with mentors and how much the student seemed to feel that the mentor truly cared about him or her (Anderson et al., 2004). These surveys were administered at one time point during one year of the study. Data on engagement were measured by (a) tracking attendance over time, and (b) administering a one-time, 13 item survey to students’ teachers that measured factors of academic and social engagement. Finn and Zimmer (2012) noted that these
academic and social factors overlap significantly with the participation aspect of engagement. However, most of the items reflect level one participation, while some of the items seem to describe a type of participation that is not included in Finn’s (1989) model (e.g. “has confidence in themselves to participate and try their best,” or “thinks ahead about consequences before acting”). In this study, the researchers found that mentor ratings of relationship quality were associated with higher engagement as rated by the teachers, and both mentor and student ratings of relationship quality were predictors of engagement as measured by attendance. Unfortunately, the truncated way in which relationship quality was measured does not help us understand how the quality of relationships evolved. Furthermore, the limited and differing ways that engagement was measured make it hard to paint a consistent picture of what researchers mean when they say “student engagement.”

Throughout the engagement literature based on the participation-identification model, researchers have acknowledged the multifaceted nature of engagement, the influential role of context (specifically teacher-student relationships), and the process-oriented nature of how students come to engage in learning. The participation-identification model was born out of Finn’s (1989) belief that a student’s choice to engage in high school all the way through graduation was not a matter of the body, class, or geography into which a student happened to be born. He believed that educators could encourage engagement by altering the contexts in which students learned. However, when translating this model into a practical research agenda, researchers rarely used the model’s full conception of engagement in practice. Furthermore, even longitudinal studies only collected data on student and teacher (or mentor) perceptions in snapshots. While one can make a comparison or a claim about change over time with these data, the ability to understand the process is limited.
**School Reform Literature**

A second research agenda on student engagement has focused on improving achievement for all students. The school reform efforts often reference the dropout literature but look at how schools could be reformed to engage all students in learning, not solely to prevent at-risk students from dropping out. The National Center on Effective Secondary Schools at the University of Wisconsin, Madison, was the site of a major study from 1985 to 1991 that culminated in the report, “Student Engagement and Achievement in American Secondary Schools” (Newmann, 1992). Newmann et al. (1992) defined engagement as “the student’s psychological investment in and effort directed towards learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote” (p. 12). This definition is much more explicit about the cognitive elements of engagement than the participation-identification model, and with continued explanation, it becomes clear that Newmann and his colleagues also see affective and behavioral elements included. They explained the process of engagement as influenced by “students’ underlying need for competence, the extent to which students experience membership in the school, and the authenticity of the work they are asked to complete” (p. 17). Furthermore, Newmann et al. (1992) highlighted that contextual factors are significant to the process of cultivating student engagement. They proposed that the “social-cultural orientations that students bring to school are the most important factors affecting student engagement” (p. 17). While these researchers did not propose a process model influenced by context as clearly as Finn (1989) or Voelkl (2012), their working conception still acknowledges the complicated and contextualized nature of how engagement evolves.

Newmann and his colleagues (1992) also highlighted the limits of traditional cognitive research methods for measuring engagement. Newmann et al. used a combination of surveys and
observational protocols in their research, but they stated in their introduction that they had trouble standardizing valid observational measures. They accounted for this, in part, because engagement must be inferred, and inferential participatory behaviors may be misleading because the same behavior in two different students may reflect one’s interest in compliance and another’s interest in mastery. By listening to students’ reflections on their own behaviors, researchers could develop better understandings of the process of engagement than those that are built on observations and self-report surveys alone. Newmann and his colleagues conceptualized engagement as a process that involves cognitive, emotional, and behavioral elements, but their research methods were insufficient to capture the holistic, contextual, and process-oriented aspects of this construct.

In 2002 and 2003, the National Research Council and Institute of Medicine (NRCIM) sponsored the Committee on Increasing High School Students’ Engagement and Motivation to Learn. This committee was made up of 15 educators from around the country who were tasked with authoring a report to help illuminate the issue of student engagement in high schools and present reform recommendations. Like Newmann et al. (1992), this committee stated that measuring “cognitive behaviors” was even more important than looking at observable participatory behaviors because observable actions can be deceiving and “only genuine cognitive engagement will result in learning” (NRCIM, 2004, p. 31). Also like Newmann et al., this committee stressed the importance of context in cultivating engagement. They conceived of context as mediated by the psychological variables of “beliefs about competence and control, values and goals, and a sense of social connectedness” (NRCIM, 2004, p. 34). Both these and Newmann et al.’s contextual factors align with the basic psychological needs at the heart of self-determination theory, to be discussed below. A research challenge plaguing many of these
engagement researchers is that, even if self-report surveys can identify whether students recognize particular engagement-related feelings at a specific moment in time, surveys cannot help us understand the process by which these contextual factors evolved and facilitated student internalization of their reported feelings.

**Flow Theory**

Another theory of engagement from the cognitive literature that embraces the holistic, contextual, process-oriented nature of engagement grew out of the research of Csikszentmihalyi and his colleagues (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 1997; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003; Shernoff et al., 2016). The definition of engagement from a flow perspective is immersion in a learning experience wherein a student experiences the co-occurrence of concentration, interest, and enjoyment. Once again, we see a multifaceted conception of engagement as explicitly including cognitive and emotional elements, and the behavioral element is implied. Furthermore, flow theory acknowledges the role of context and process because it is based on an optimal arousal model of motivation (Csikszentmihalyi et al., 1997). The assumption here is that, as the environment provides different obstacles and resources, students will seek out challenges to avoid boredom and work to perfect their skills to avoid anxiety. These challenges must be interesting to the student, but the concentration and enjoyment derive, in part, from the optimal challenge. The space in which engagement occurs is in the context that offers students interesting challenges that are outside of their current ability level but not so hard that they cannot grow into greater competence through their own work.

The researchers who developed flow theory have used methods for data collection that attempt to capture students’ lived experiences in the classroom more accurately. They have used
the experience sampling method (ESM) as a means to collect data on student engagement in learning (Csikszentmihalyi et al., 1997; Shernoff et al., 2003; Shernoff et al., 2016). With ESM, students carry pagers and are randomly paged at different moments throughout a class or day. As soon as students are paged, they are asked to respond immediately to a survey that is intended to document and measure their engagement experience at that moment. These surveys include a combination of Likert scale and open-ended questions. The questions ask them both about their external experiences (what are they doing, whom are they with, where are they) and their internal experiences (interest, enjoyment, concentration, control, challenge). By collecting data this way, researchers have attempted to address the problems of recency bias (in which students respond to a survey based not on their “average” but their most recent experience) and memory decay (in which students fail to fully remember their experiences when asked to reflect on them after the fact).

Even though ESM offers a way to take more proximal snapshots of students’ experiences, the method does not capture the process of how context and individual are interacting. Even though different aspects of cognitive and affective engagement are measured with the Likert scale questions, the researchers have collapsed the data from these responses into unified engagement scores. This obfuscates the possible relationship between and among different factors of engagement (Csikszentmihalyi et al., 1997; Shernoff et al., 2003; Shernoff et al., 2016). It is also hard to understand the relationship between student engagement and the context because even though the ESM surveys tell researchers who or what is in the student’s contextual experience, they do not capture how the socio-contextual environment is interacting with the student. Shernoff and his colleagues (2016) collected observational data about the social context in a classroom in which students were also responding with ESM. They then correlated the
observational data with students’ self-report surveys. However, these observational data were collected on Likert scale questions and then collapsed into a numerical “score” for how supportive the social context appeared to be to the students in the room. This assumes that all students experienced the supportiveness of the room equally, and that outside, adult observers were accurate judges of how observable behaviors translated to feelings of support that students felt. This study indicates that changes in the supportiveness of the classroom context positively correlate with changes in engagement, but these results still do not help us understand the processes at work and the variety of student experiences.

**Sociocultural Theory**

Vygotsky did not have a chance to address the topic of student motivation and engagement directly before his untimely death. However, in his work he alluded to the integral role of these forces in the process of student learning. He noted that “[t]hought is not begotten by thought; it is engendered by motivation. . . . Behind every thought there is an affective-volitional tendency, which holds the answer to the last ‘why’ in the analysis of thinking” (Vygotsky, 1934/2012, p. 267). Furthermore, when discussing the evolution and integration of written language into a child’s repertoire of intellectual tools, he commented that “writing should be meaningful for children, that an intrinsic need should be aroused in them, and that writing should be incorporated into a task that is necessary and relevant for life” (Vygotsky, 1978, p. 118).

Throughout his writings about learning and development, Vygotsky stressed the social nature of learning (1934/2012, 1978). Intersubjectivity is the process through which the student and a more knowledgeable other co-construct new understandings based on a negotiation process—each must strive to understand the other at the same time that they are seeking to be understood. This collaboration is inherently a social process involving human emotions.
Emotion is no less important a tool than is thinking. The teacher must be concerned not only that students think about and learn geography, but also feel deeply about it. . . . [I]t is precisely the emotional reactions that have to serve as the foundation of the educational process. Before communicating a particular piece of knowledge, the teacher should induce the appropriate emotion in the student, and take care to associate this emotion with the new knowledge. (Vygotsky, 1997, p. 107)

Even though engagement is not addressed directly, Vygotsky seems to recognize that active student participation is inherent to the learning process. Exploring Vygotsky’s theory of what happens in the zone of proximal development helps us see how a sociocultural conception of engagement can overlap with cognitive definitions.

The zone of proximal development (ZPD) refers to the space in which learning occurs, from a sociocultural perspective (Vygotsky, 1934/2012, 1978). The ZPD inherently involves a challenge for a student. It encompasses the challenges that a student can navigate successfully only with the assistance of a more capable other. Like Goldilocks’s choices, these challenges are not too easy nor too hard, but unlike Goldilocks’s bed or porridge, the challenge is constantly evolving and requires interaction with a more knowledgeable person. Rather than a static place or state, the ZPD reflects an evolving process whereby students mature and grow into more complex ways of knowing and solving problems. A challenge that starts as almost too hard gradually becomes easier until the student has fully internalized new ways of knowing and can use them independently. For a student’s engagement in learning to continue, the teacher must continuously re-establish challenges and support student participation in working through them. Vygotsky’s process and growth orientations are evident in his use of growth metaphors to describe the ZPD.
The zone of proximal development defines those functions that have not yet matured but are in the process of maturation, functions that will mature tomorrow but are currently in an embryonic state. These functions could be termed “buds” or “flowers” of development rather than the “fruits” of development. (Vygotsky, 1978, p. 86)

The process of learning that occurs in the zone of proximal development is thus marked by both struggle and collaboration (Levykh, 2008). The ZPD must be a space in which the student encounters both a challenge and a supportive guide to offer assistance when the challenge becomes too overwhelming or new complexity when the challenge becomes too easy. The guide adapts and modifies the challenge experiences as the student grows. Even with appropriate assistance, the ZPD can be uncomfortable for the student. Much like “growing pains,” the work in which students engage in the ZPD is not yet easy nor natural.

More recent sociocultural researchers have frequently used participation as a synonym for engagement (Hickey & Granade, 2004; McCaslin, 2009; Rogoff, 1990), but the ways in which they use participation reflects a blending of the behavioral, affective, and cognitive forms of engagement described by Fredricks et al. (2004). For example, Hickey and Granade (2004) argued that “to be engaged in learning is to be participating in the meaningful use of knowledge practices” (p. 230). Similarly, Rogoff (1990) advocated for an active, willful notion of engagement in learning (in her case, she used the term thinking synonymously with engagement in learning): “cognition and thinking are defined broadly as problem solving. Problem solving involves interpersonal and practical goals, addressed deliberately. . . . Thinking, feeling, and acting are integrated in the problem-solving approach that I use” (Rogoff, 1990, pp. 8-9). Thus, the sociocultural literature suggests that engagement in learning must inherently include all factors of engagement as defined by cognitive theorists.
Some sociocultural researchers have criticized how many of their colleagues have emphasized the intellectual or cognitive aspects of the ZPD to the exclusion of its affective aspects (Goldstein, 1999; Levykh, 2008; Mahn & John-Steiner, 2002). For example, one of the most famous evolutions of Vygotsky’s ideas is the notion of scaffolding developed by Wood, Bruner, and Ross (1976). When these researchers analyzed their results and described the effective teacher-student relationship, they discussed how frequently assistance was given, at what points in the problem solving process, and whether the assistance was verbal or visual. It was only in an off-handed remark when describing their methods that the researchers acknowledged (but did not discuss) the relational aspects of the teacher-student relationship:

There is one remaining issue that will not concern us formally in this study but which is of some importance. The tutor . . . brought to the task a gentle, appreciative approach to the children. She did not so much praise them directly for their constructions or for their attention to the task, but rather created such an atmosphere of approval that the children seemed eager to complete their constructions—often, seemingly, to show her as well as to reach the goal per-se. A testing procedure and a tutor create an atmosphere of encouragement or discouragement: in the present case it was the former, and the results certainly reflect it. (Wood et al., 1976, pp. 92-93)

This side note highlights the under-explored territory of what Goldstein (1999) called the zone of relational development.

In a theoretical article, Goldstein (1999) suggested that the influence of cognitivist research has over-emphasized the intellectual layer of Vygotsky’s zone of proximal development (ZPD) at the expense of exploring the emotional or relational level of the ZPD. From this perspective, much work needs to be done to recognize and explore the inter-relational (not
merely the inter-psychological) processes that occur when one participates in the inter-subjective process of learning through the ZPD. While only a theoretical line of work at this point, Goldstein has hypothesized that adults and students choose to enter into a ZPD (i.e., they both collaborate in the process of learning) when that interaction is intellectually and emotionally satisfying for both the student and the adult (Goldstein, 1999).

Hickey and Granade, (2004) framed the topic of affective engagement through the language of participation. From this perspective, it is not that students acquire the motivation to engage in learning per se, but it is more that they maintain interpersonal relationships, identities as members of a particular community, and satisfying interactions with the environment in which that community acts so that they continue to participate in the negotiation and co-construction of what it means to value and use knowledge in that particular community (i.e., learning). It is the practices, rituals, and norms of the community that define the mutually accepted level and nature of what engagement looks like for that group (Hickey & Granade, 2004). In this case, researchers have suggested that better questions to ask about engagement are really questions about how and why a person comes to identify with (and thus participate in) a particular community.

Sociocultural work done in the United Kingdom and Australia (Deakin Crick, 2012; Deakin Crick, Broadfoot, & Claxton, 2004; Deakin Crick, Jelfs, Huang, & Wang, 2011) has focused on identity formation as the key to understanding engagement. This line of research has distinguished deep engagement from compliance or passive engagement. Compliance or passive engagement is seen as the kind of engagement that leads to dependent and fragile learning. In this case, students who merely follow instructions and do what they are told do not develop the kind of understanding that empowers them to adjust when something does not work or flexibly apply knowledge to new situations. Deep engagement, on the other hand, reflects commitment,
personal investment, and participation that is carried out within a sociocultural context. In this case, there is a sense of agency and authorship that the student exudes as he or she negotiates and internalizes an identity as one with learning power in a particular community. This sense of agency alludes to the concept of internally-regulated or autonomously-motivated engagement as defined in the self-determination literature.

**Self-Determination Theory**

Self-determination studies of student engagement began with Connell’s (Connell, 1990; Connell & Wellborn, 1991) self-determined self-systems model of motivational development. The self-determination part of this model is rooted in the work of Deci and Ryan (1985). The model that Deci and Ryan proposed distinguishes between different types of motivational forces that inform engagement. In their model, these researchers transformed the dichotomy of extrinsic versus intrinsic motivation into a spectrum. At the extrinsic end, the motivation behind ones engagement is driven by outside forces outside of the person’s control—such as coercion. At the intrinsic end, the motivation behind ones engagement is driven by internal forces under the person’s control—such as personal interest. Unlike dichotomous models, Deci and Ryan contended that environmental factors cannot only facilitate engagement (by providing sources of coercion or interest), but they can also facilitate the transformation of the quality of the motivational force that a person feels for why he/she is engaging (i.e., engaging in the same activities, but shifting ones feelings of coercion more towards feelings of personal control).

In self-determination research, the most constructive learning outcomes are linked to autonomously-motivated forms of engagement. Engagement refers to how the students act, but motivation and engagement are inherently intertwined. In cognitive research, there is no engagement process without an accompanying motivational experience (Appleton, Christenson,
Researchers who have done work based on the self-determination theory have done the most to parse out a motivational model undergirding engagement (Connell & Wellborn, 1991; Deci & Ryan, 1985; Ryan & Deci, 2000; Skinner et al., 1990). From this perspective, the motivation that drives student engagement falls along a spectrum of control. On the one end, students feel completely coerced to engage in learning. The quality of this type of engagement is referred to as control-motivated engagement. In a coerced situation, outside forces (e.g., teachers) extrinsically motivate students to engage in learning by making engagement in learning a prerequisite for a student to access a separate goal that he/she wants, such as the parental approval or college acceptances that can come from obtaining good grades. On the other end of the spectrum, students feel completely in control of their decision (i.e., self-determined or autonomous) to engage in learning. The most powerful form of personal control is referred to as intrinsic motivation. This is when a student has already developed an internal desire or interest. The development of autonomously-motivated engagement, however, can be facilitated by the immediate social context. The unique contribution of self-determination theory researchers (Deci & Ryan, 1985; Deci et al., 1991; Ryan & Deci, 2000) is that they have developed a model that illustrates how students can gradually internalize greater feelings of self-determination for their engagement in learning. While there are varying degrees of intensity (referred to as identified and integrated), the autonomous end of the spectrum refers to the shift from “it’s what you want me to do” to “it’s what I want to do.” Students who are engaged in activity that is linked with autonomous motivation agree with and accept the value of the activity in which they are participating (Deci et al., 1991). Thus, when self-determination researchers discuss the teacher-contextual factors that support engagement, they are specifically looking at teacher moves that support autonomously-motivated engagement.
At the same time that Deci and Ryan (1985) focused their research energies on developing theories of motivation, Connell (1990; Connell & Wellborn, 1991) expanded self-determination theory by proposing a model that explained the entire process of context, motivation, engagement, and learning outcomes. Connell’s self-systems model of motivational development proposes a four part linear pathway through which student engagement manifests. The pathway begins with the academic context, which then affects a student’s self-systems processes (i.e., their experience of internal motivation), which then affects their expression of outward engagement, which subsequently affects academic outcomes. The focus of this model is on the full, contextual, process of engagement.

Connell and his colleagues (e.g., Connell, 1990; Connell & Wellborn, 1991; Jang, Reeve, & Deci, 2010; Reeve & Jang, 2006; Reeve et al., 2004; Skinner et al., 1990; Skinner, Furrer, Marchard, & Kindermann, 2008) have argued that contextual factors that influence feelings of motivation and subsequent engagement should be analyzed in three parts that align with the three different basic psychological needs in self-determination theory. Thus, relevant contextual factors are experiences from the environment that satisfy a student’s basic psychological needs for autonomy, competence, and relatedness. This theory is based on the assumption that humans are naturally curious and growth oriented, but their environmental contexts can either support or thwart growth—much like a seed can land in sand or well composted manure. The distillation of these needs grew out of exhaustive reviews of motivational literature and experimental studies conducted primarily by Deci and Ryan (Deci & Ryan, 1985; Ryan & Deci, 2000). The need for autonomy is based largely on deCharms’s (1968, 1976) work on personal causation, or the feeling that we are in control of our own actions. The need for competence is rooted in research going back to White’s (1959) famous studies with mice preferring challenge. The need for
relatedness is rooted in Bowlby (1969) and Ainsworth’s (Ainsworth, 1979, 1989) work on parent-child attachment and security. Each of these ideas—the need to feel in control, the need to feel capable of overcoming challenges, and the need to feel valuable and connected—is present in the cognitive research reviewed above. Thus, self-determination theory proposes a comprehensive model and framework for how educators can attempt to create fertile ground to help nurture student engagement.

**Needs-supportive teaching.** The framework Connell and his associates (Connell, 1990; Connell & Wellborn, 1991; Skinner et al., 1990) proposed for how the teacher (as primary social context) can support student engagement is the idea of needs supportive teaching. Needs supportive teaching includes autonomy support, structure, and involvement. Teachers can provide autonomy support by offering students choices, making room for students to take initiative, recognizing students’ feelings and perspectives, and helping illustrate the relevance and connection of school work to students’ lives. Structure (which supports feelings of competence) can be communicated by offering clear and explicit expectations, administration of consistent consequences, and competence-related feedback. Finally, teachers provide involvement (which supports relatedness) by showing students that the teacher is interested in them, enjoys their company, and values their opinions (Connell, 1990).

Research has produced consistent results that students who perceive their teachers as supporting their basic psychological needs experience greater levels of motivation and subsequent engagement in school. Studies across 1st–12th grades for students of different races and socioeconomic backgrounds reveal that students’ perceptions of the needs supportiveness of their teacher’s behaviors predict their own engagement in class (Birch & Ladd, 1997; Connell & Wellborn, 1991; Davis, 2006; Jang et al., 2010; Ryan & Patrick, 2001; Skinner et al., 1990,
Tucker et al., 2002). In a related study, Finn and Voelkl (1993) also found that small school size along with fair and flexible administration of discipline were highly correlated with higher levels of student engagement. The researchers interpreted these findings as indicators that smaller school size and fairer rule systems made it easier for students to build relationships with teachers.

One limitation of the studies on the effects of needs supportive teaching is that most of the research is based on limited snapshots of student perceptions. Only two studies (Klem & Connell, 2004; Skinner, Furrer, Marchand, & Kindermann, 2008) have looked at changes in students’ perceptions of their teachers’ needs supportiveness over time. Furthermore, most of the research conducted has been correlational, not causational. One significant exception is a study by Reeve and colleagues (Reeve et al., 2004). In this study 20 high school teachers were involved in a delayed control group study in which half received instruction on autonomy-supportive teaching (i.e., strategies intended to support students’ need for autonomy) and were observed before and after training, while the other half of the teachers received the same treatment after the first 5-week phase had been completed. This study concluded that teachers who were trained in autonomy supportive techniques did, in fact, use more of them in class, and their students, in turn, exhibited more engaged behavior (based on trained observer rankings).

More recently, Su and Reeve (2011) conducted a meta-analysis of interventions. They found 19 in all, but the interventions were focused mostly on elements of autonomy support and neglected the structure and involvement components of needs supportive teaching. All of this research offers good reason to believe that teachers who make students feel a sense of basic psychological needs fulfillment, indeed, have more student engagement in their classes. However, there is a dearth of research on how students come to perceive their teachers as needs supportive and how these perceptions may morph and change over time.
This picture is complicated even more by the fact that there are mismatches between students’ and teachers’ perceptions of each other’s motivation and motivational supportiveness. A longitudinal study (Skinner et al., 2008) based on the self-systems model that focused on predicting changes in motivation and engagement over time between 4th and 7th grades reported but did not discuss an illustrative example. The study in question measured the quality of the academic context by asking both teachers and students to fill out questionnaires about the teachers’ levels of needs supportive behaviors. Teachers consistently rated themselves higher on their needs-supportiveness than students did, and, as students got older, the gap between teacher and student ranking consistently grew wider, with teachers’ perceptions of themselves staying relatively constant but students’ perceptions of their teachers’ needs supportiveness dropping. Later, Lee and Reeve (2012) focused directly on the issue of teachers’ accuracy in predicting students’ feelings of basic psychological needs satisfaction and found that middle school teachers consistently overestimated the level of needs satisfaction that students themselves reported. These findings indicate a need for qualitative research on how students and teachers construct their perceptions of the supportiveness of the teacher’s moves as they pertain to the self-system processes that can support or thwart academic engagement.

Another challenge to unpacking the story of what needs-supportive teaching moves look like is the complexity of how student perceptions are formed. In a meta-analysis, Stroet, Opdenakker, and Minnaert (2013) highlighted the dearth of observational or teacher perception research in general on needs-supportive teaching. What little research that existed using these data collection methods did not reveal a relationship between needs-supportive teaching and student motivation or engagement. The authors noted that these limited results may reflect measurement challenges because trained raters cannot observe the full, comprehensive set of
experiences that inform a student’s perception of a teacher. Furthermore, Davis (2006) found that student perceptions about the quality of their relationships with teachers are influenced not only by experiences with the teacher in question but also by experiences with previous teachers and the broader classroom climate that teachers create outside of direct, one-on-one, teacher-student interactions. These findings suggest a need to combine observational data with student reflection so as to help researchers understand how students experience the actions and words that researchers are able to observe.

Researchers have produced a number of studies that indicate reciprocal effects of student engagement on their own feelings of motivation and teacher supportiveness, thus confounding the linearity of the self-systems model. In one of the earliest, large-scale studies of intrinsic student motivation and engagement Fiedler (1975) obtained students’ self-reports of their feelings of origination (a motivational component similar to autonomy) and then used an observational tool to measure student engagement and teacher supportiveness of autonomy. The researchers defined these observable behaviors as “hits” and “steers.” A hit was defined as either a teacher or a student’s attempt to influence the other party, and a “steer” indicated a receptive response from the party towards whom the influencing attempt was made. In the 52, 7th grade classrooms observed, the researchers found that in classrooms in which students felt greater feelings of origination, not only did teachers make fewer attempts to direct students, but the teachers were also more open to students’ attempts to influence the teachers. Students in these classrooms were also more engaged in attempting to influence their teachers (they expressed more “hits” towards their teachers). These findings raise the question of whether teachers who engender higher feelings of autonomy support for their students may be doing so, in part, because their students are engaged in the first place.
Similarly, longitudinal studies by teams associated with both Skinner and Reeve (Furrer & Skinner, 2003; Jang et al., 2012; Reeve & Lee, 2014; Skinner & Belmont, 1993) have demonstrated that the directionality of the effects of needs supportive teaching, motivation, and engagement is not stable. Furrer and Skinner (2003) found that greater student engagement leads to more feelings of relatedness satisfaction just as much as greater feelings of relatedness satisfaction lead to more engagement. This finding makes sense in light of Skinner’s earlier work (Skinner & Belmont, 1993) which revealed that students who demonstrated higher initial engagement in the school year received greater levels of needs-supportive teaching from their teachers as the year unfolded than did their less engaged peers. In a large-scale, longitudinal study with 5th – 8th grade students, Voelkl (1997) demonstrated that higher achievement and participation predicted gains in a student’s sense of belonging to and value for school. Furthermore, Jang et al. (2012) and Reeve and Lee (2014) also demonstrated that engagement at early and mid-year time points predicted students’ feelings of needs satisfaction at the end of the year. Finally, the directionality and relationship between the different factors of engagement itself have also been brought into question (Green et al., 2012). This research offers evidence that there are bi-directional effects between teacher supportiveness of basic psychological needs and student engagement, but none of the aforementioned studies attempts to unpack how or why those relationships work; they simply document that they exist.

**Teacher-Student Relationship Building and Engagement**

In addition to engagement research cited above, researchers have affirmed the vital role that teacher-student relationships play in the motivation to engage in learning. Two main conceptions at the heart of most of the work on teacher-student relationships are attachment theory (Ainsworth, 1989; Bowlby, 1969) and pedagogical caring theory (Goldstein, 1999;
Noddings, 1984; 2005; Wentzel, 1997). These theories assume an inherent power imbalance between relationship partners due to the unequal authority that the school, students, and society afford the teacher (Dobransky & Frymier, 2004; Frymier & Houser, 2000). Thus, each of these two theories positions the teacher as the relationship partner with greater responsibility. Both attachment and pedagogical caring theories propose that the teacher as caregiver in the relationship is tasked with being responsive to the needs of the student as cared-for. In attachment theory, the warmth, openness, and attentiveness expressed from a close caregiver help to engender feelings of security in the child (the cared-for), and subsequently the child is more willing to express curiosity and healthy exploration of her environment. In the pedagogical caring theory, Noddings (1984; 2005) is more explicit about the role that both parties play in the caring relationship. The one-caring (the teacher) needs to be receptive to and engrossed in the needs of the cared-for, and the cared-for (the student) needs to affirm that she has received this care through some sort of “questions, effort, comment, and cooperation” (Noddings, 1984, p. 181). The teacher roles in both of these models parallel the needs-supportive teacher moves related to involvement. Furthermore, the student roles—curiosity and exploration in the attachment model and responsive inquisitiveness and effort in pedagogical caring—both echo conceptions of engagement in and of themselves.

Based on the above review of engagement, it is evident that most engagement researchers believe that teacher-student relationships play a role in the social context that facilitates or inhibits the student engagement process. In the participation-identification model, the teacher moves most closely associated with the self-systems idea of involvement include concepts such as showing care for a student, concern for a student’s welfare, interest in a student, and support for a student’s efforts (Anderson et al., 2004; Finn & Voelkl, 1993; Voelkl, 2012). Teacher-
student relationships play a vital but less understood role in the student engagement process from the sociocultural perspective as well. Researchers have highlighted how Vygotsky’s work implied that teacher-student relationships played an integral role in learning, even if this role was not explored explicitly before his untimely death at age 37 (Goldstein, 1999; Levykh, 2008; Mahn & John-Steiner, 2002). Intersubjectivity is required for learning, and this process requires teacher and student to engage with each other collaboratively. Goldstein (1999) has suggested that the relational zone of proximal development (RZPD) complements and is inextricably intertwined with the cognitive zone of proximal development, but they are distinct components of the learning process. She suggested using Noddings’s (1984) ethic of care theory as a lens to understand how this relational zone evolves, but she offered no empirical support for this postulation. Self-determination theory may offer some clues about the kinds of social and emotional indicators to look for in the RZPD, but we still do not have a working model of the contextually-situated process through which students come to internalize feelings of teacher “involvement.”

Other researchers who have investigated the role of teacher-student relationships and engagement have followed the pattern of using attachment and pedagogical caring models but have produced results with limited applicability to supporting the engagement of high school students. In 1992, Pianta and Steinberg developed the Student-Teacher Relationship Scale (STRS) to measure how teachers qualified their relationships with students based on warmth/security, anger/dependence, and anxiety/insecurity. When Pianta and Steinberg used this 16-item, Likert scale questionnaire with 26 kindergarten teachers (who taught a combined 436 students), factor analysis produced five different relationship types: conflicted, warm, open, dependent, and troubled. In terms of the relationship between these factor types and student
engagement, it is not surprising that these researchers found that students with a conflicted or troubled relationship with the teacher acted out more, and students who did well had warm and open relationships with the teacher. In a later study, Pianta and Stuhlman (2004) used the STRS again with 490 students to measure the levels of conflict and closeness that teachers rated for their relationships with their students. Pianta and Stuhlman followed these students from preschool through 1st grade. They found that the quality of student-teacher relationships was relatively constant across grades and that the quality of relationships predicted changes in academic and social skills across grades. Researchers from the University of Illinois at Urbana-Champaign (Birch & Ladd, 1997; Ladd et al., 1999) also conducted studies with kindergarteners using the STRS questionnaire to measure the quality of students’ relationships with their teacher. Again, these studies asked the teachers to rate the quality of the relationships. They found that adverse relationships between teacher and student correlated with low participation and achievement (Ladd et al., 1999) and difficulties adjusting to school (Birch & Ladd, 1997). While these findings support the notion that teacher-student relationships are important to student engagement, they are based solely on teacher perceptions and applicable only to very young students.

Studies focusing primarily on the quality of middle school students’ relationship quality with teachers and engagement have tapped student voices, but have been limited in their scope. Wentzel (1997) applied the pedagogical care model to her study of student teacher relationships and motivation and collected both quantitative and qualitative data from 248 students. She found that positive relationships were positively correlated with student effort, pro-social behavior, and social responsibility. The measure of these relationships, however, was only based on 4 Likert scale items. In addition to these data, Wentzel also collected open-ended responses in which
students listed three characteristics of teachers who care and three characteristics of teachers who
did not care. The analysis of these data produced six categories that described patterns in most of
the student responses. The most consistent response of what made a caring teacher was a
category about focusing on individuality, including descriptors such as, “asks if I need help;
takes time to make sure I understand; and calls on me” (Wentzel, 1997, p. 416). While Wentzel’s
work offers more insight into adolescents, it still did not encompass high school students, and
extensive work has not been done to understand the processes or teacher moves in context that
helped form the perceptions that students reported in this study.

Relatedness and Teacher-Student Relationships

From a self-determination perspective (Skinner et al., 2008), teacher-student relationships
are subsumed under the needs supportive (or needs inhibitive) teacher moves characterized as
involvement on the positive side or its inverse, rejection, on the negative side. Students are more
likely to become engaged when they feel that teachers are “involved” with them. Involvement
refers to the ways that a teacher shows positive regard for a student and takes his opinion and
feelings into account when making decisions (Connell & Wellborn, 1991; Klem & Connell,
2004; Skinner & Belmont, 1993; Skinner et al., 1990; Ryan & Patrick, 2001; Voelkl, 1995).
Rejection moves, or teacher moves that inhibit autonomously-motivated engagement, include
teacher behaviors that make students feel rejected, neglected, put-down, or ignored (Furrer &
Skinner, 2003; Skinner et al., 2008).

Self-determination researchers have conducted many studies that focus on needs-
supportive teacher moves that support the needs of autonomy and competence, but they have
excluded relatedness (Jang, 2008; Jang et al., 2010; Reeve, Bolt, & Cai, 1999; Reeve & Jang,
2006; Reeve et al., 2004; Su & Reeve, 2011). Jang et al. (2010) suggested that different types of
teacher moves are insufficient if performed alone. In other words, a teacher who provides a great deal of structure but no autonomy support will not necessarily succeed in facilitating students’ engagement in learning. Reeve et al. (1999) studied the teacher moves associated with teachers who supported different types of motivational styles. Teachers were first given a questionnaire that provided teaching vignettes and then possible responses from the teacher. These responses reflected varying levels of autonomy support or controlling styles. Once the teachers received a score for how hypothetically autonomy supportive or controlling they were, they were then put in either a lab experiment to teach a person (one on one) how to solve a puzzle or they were asked to write a story about a real life classroom situation in which they tried to motivate a student. The kinds of teacher moves they exhibited were correlated with their “motivational style” score to ascertain the kinds of moves that autonomy supportive vs. controlling teachers tend to employ in real life. The problem here is that all teacher moves have been condensed into autonomy support when perhaps there is actually an interplay of types of moves. Jang et al. (2010) addressed this dilemma in part by designing a study that used trained raters in 133 different high school classrooms who observed and rated the quality of teachers’ moves separately for structure and autonomy support. These researchers concluded that teachers who facilitate optimal engagement will exercise a combination of autonomy supportive and structured moves, but involvement moves were not explicitly studied. When looking at the measures they used for autonomy support in comparison to other definitions of involvement, there may have been some blurring of the lines. For example, “listens carefully, openly, understandingly” along with “accepts negative affect, complaints are OK” (Jang et al., 2010, p. 592) were included as two of the rated measures for autonomy support. Furthermore, observational data were not collected on relatedness-relevant teacher moves. While these studies suggest more insight into
the specific teacher moves that do and do not support autonomously-motivated engagement, they
do not offer full explanation of the distinctions and interplays between all the types of teacher
moves that could facilitate or inhibit autonomously-motivated engagement, especially those
relevant to relatedness.

A major limitation to the self-determination research on involvement is the narrow scope
of how teacher-student relationships have been measured. In two of these studies (Furrer &
Skinner, 1993; Skinner et al., 2008), four, Likert-scale questions that asked students to report on
how much they felt like their teacher made them feel special, accepted, ignored, and unimportant
were the only measure of teacher involvement. Other studies (Skinner & Belmont, 1993;
Wellborn, 1992) used precursors to the current, main self-determination measure of school
context, psychological needs fulfillment, and motivation known as the Research Assessment
Package for Schools (RAPS, formerly the Rochester Assessment Package for Schools). The most
recent version of this survey includes a version for elementary school students and a version for
middle school students (Institute for Research and Reform in Education [IRRE], 1998). The
elementary school version includes two items to assess perceived involvement (referring to
perceived affection and time that the teacher has for the student), and the middle school version
includes five items (again, addressing affection, time, and also perceived care for the student’s
success). Interestingly, self-determination researchers have defined the engagement-facilitative
teacher moves for involvement, autonomy support, and structure, and merely reverse coded
items based on these definitions to define teacher moves that inhibit engagement. One study
(Skinner et al., 2008) suggested labels for the inverse of these moves (rejection, coercion, and
chaos), but none so far have explored or measured these teacher moves as separate, albeit inverse
constructs.
In the few studies that have focused on involvement, researchers (Furrer & Skinner, 2003; Skinner & Belmont, 1993; Skinner et al., 2008; Skinner et al., 1990) have found that teacher involvement plays a unique role in supporting student engagement. When looking at the relationship between how students in 3rd through 5th grade rated their teachers’ supportiveness moves, Skinner and Belmont (1993) found that involvement had the greatest effect in students’ overall perception of their teacher’s supportiveness when compared with autonomy support and structure moves. When students perceived less involvement from their teacher, they were more likely to also perceive less autonomy support and less structure. Furthermore, the students’ perceptions of their teachers’ moves mediated between teacher perceptions and the students’ engagement (Skinner et al., 2008). In another study with 3rd through 6th graders (Furrer & Skinner, 2003), researchers determined that student perceptions of teacher involvement predicted student engagement above and beyond the involvement students felt from parents or peers. Additionally, research from this same study suggested that the effects of teacher involvement become more powerful to a student’s subsequent engagement as he or she moves from elementary to high school, but at the same time, students report that they feel less involvement from their teachers as they get older (Furrer & Skinner, 2003). This is all the more reason why we should care about empowering educators to develop a deeper understanding of engagement-supportive teacher-student relationship process.

**Theoretical Framework and Research Questions**

The theoretical frame that drove this study is the self-systems model of motivational development (SSMMD) that is nested within self-determination theory (Connell & Wellborn, 1991; Skinner et al., 2008). This theory includes both intra- and inter-psychological processes that play roles in the process of developing engagement in learning. The social context within
which a student is situated provides inter-psychological experiences that can either inhibit or facilitate the perceived intra-psychological experience of needs satisfaction. In turn, the intra-psychological experience of needs satisfaction (or lack thereof) influences the student’s choice to act within the environment and either engage or not in learning. Engagement that results from intra-psychological experiences of needs satisfaction is autonomously-motivated engagement. Finally, learning outcomes that result from autonomously-motivated engagement are the kind of high quality, conceptual learning outcomes that are described in theories like sociocultural theory. Thus, these outcomes for learning and achievement are more desirable than those resulting from control-motivated engagement.

Rather than a theory of learning, per se, the SSMMD provides a theoretical frame for how students come to be involved in the process of learning. As Goldstein (1999) suggested in her sociocultural distinction of the cognitive vs. the relational zones of proximal development, there is ample reason to believe that learning cannot occur without a process that brings a student willingly into a learning activity. SSMMD offers a bridge out of the cognitive focus on the individual alone towards a broader understanding of how the context and individual interact. There are many theories that explain what happens once the student is engaged in trying to learn, but those are not directly helpful to the purposes of this study. Instead, this study assumes that successful learning can and will take place once a student is engaged in the process from an autonomously-motivated perspective.

There is substantial evidence that autonomously-motivated engagement correlates with positive academic outcomes. The more students are engaged in school, the more they will get out of the experience. There is ample evidence in the cognitive research that students who experience feelings of having their basic psychological needs met—especially if they perceive
their teachers as meeting these needs—are more likely to be engaged in school. What we know much less about is the process whereby students come to perceive their basic psychological needs as being satisfied by their teachers (Stroet, Opdenakker, & Minnaert, 2013). A purpose of this study has been to expand our understanding of the teacher moves that are part of the inter-psychological process of the SSMMD. While cognitive researchers have acknowledged the role that teacher moves play in the engagement process, much work is left to be done to explore the nuances in student and teacher perceptions of the teacher moves that matter (Connell & Wellborn, 1991; Skinner et al., 2008).

To understand more about how the process of teacher-student relationship building relates to the process of student engagement in learning, I used the framework of self-determination theory in a broad sense. I considered how specific teacher moves fit within a psychological needs-supportive and needs-inhibitive framework. Given the dearth of attention to relatedness that researchers have demonstrated in self-determination research thus far, I have incorporated literature from the myriad relationship and engagement literatures summarized above as it seems applicable to the relatedness relevant moves in this framework. Appendix A illustrates how the literature summarized above offers a variety of definitions for teacher moves that fit within this framework.

I have taken some liberty with the category labels for the needs-inhibitive teaching moves. Given the fact that most self-determination research has explored needs-inhibitive teaching moves only indirectly (by writing reverse coded items on surveys), there are no consistent labels that have emerged for how to describe these kinds of moves as distinct categories in and of themselves. My choice to use “control” as the inverse of “autonomy support” is supported by most definitions of these types of moves and is somewhat synonymous
with the one source (Skinner et al., 2008) that offered a potential label, which was “coercion.” In the case of the other two needs-inhibitive categories, I added to Skinner et al.’s (2008) label of chaos to try to capture a broader definition of all the ways in which optimal challenge may be undermined (e.g., by drawing on flow theories). Not knowing what to do or how to act is inhibitive to feeling a sense of confidence but so is not having anything to do in the first place. Thus I combined chaos and understimulation as the label for the category of competence-inhibitive moves. Finally, Skinner et al. (2008) suggested “rejection” for the inverse of involvement, but this seems to privilege the active ways in which teachers might inhibit feelings of connection and relatedness. Alienation seems to be more inclusive of both active (rejecting) and passive (neglecting) ways that a teacher may fail to connect with students.

According to self-determination theory, teacher moves can inhibit or facilitate the development of autonomously-motivated engagement. While a teacher’s behaviors are not the only contextual factors that influence a student’s engagement, they are a significant source. The teacher can facilitate a student’s engagement insofar as he is able to augment feelings of relatedness, competence, and autonomy within a student. The teacher does this by enacting needs-supportive teacher moves in ways that students perceive as supportive. On the other side, if students perceive the teacher’s moves as needs-inhibitive, then their feelings of psychological needs fulfillment will be diminished, and they will be less likely to engage from an autonomously-motivated perspective.

This study was designed to collect data about students’ and teacher’s perspectives on the specific teacher moves that they perceived as facilitating or inhibiting engagement. In addition to observational data, the elicitation of teacher and student perspectives on class experiences offered greater insight into how students experienced teacher moves in context. This type of data
collection has allowed me to not only distinguish teacher moves more clearly in a classroom context, but it has also helped me to understand some of the ways in which students’ perceptions of these moves may shift and morph under different circumstances.

Exploring teacher moves and how teacher and students perceive these moves opens a window to helping researchers understand how students do or do not become more fully engaged participants in a particular classroom community. This leads to the focus for this study. In this study, I describe and explain the processes by which students in one 9th grade science classroom became more or less engaged in learning with a particular focus on the role that relationships with their teacher played in facilitating or inhibiting this engagement. I seek to answer the following questions:

1. What are teacher and student perspectives on the process of student engagement in learning in the classroom, and how is evidence of that process related to evidence of teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those changes related to the quality of teacher-student relationships in the classroom?
CHAPTER 3

METHODS

Introduction

Before beginning my doctoral work, I was a high school social studies teacher for 12 years. Throughout my career, I worked to teach in ways that engaged students in developing higher order thinking skills. In some ways, I am what Geertz (1973) would call a native in this study. As a former classroom teacher, I bring certain preconceived notions with me to this study. I believe in the value of student engagement in learning. Furthermore, I believe that both teachers and students are actors with agency in the classroom. This means that, while the teacher may have the ability to encourage engagement through the choices he makes about designing and facilitating the learning environment, students also choose when and how they participate. My assumptions about and interest in engagement led me to pose the following research questions:

1. What are teacher and student perspectives on the process of student engagement in learning in the classroom, and how is evidence of that process related to evidence of teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those changes related to the quality of teacher-student relationships in the classroom?

While it has been incumbent upon me to critique and challenge my subjectivities, I would not consider them inherently corrosive to my research process. The goal of this study was to develop a deeper understanding of the relationship between student engagement and relationship building in a particular classroom context. My previous experience as a teacher has helped attune me to the need to investigate this particular relationship. Peshkin (1988) noted that subjectivities are useful in shaping our listening, observing, and thinking in unique ways. However, left
unexamined they could have also interfered with my ability to discern intentions and meanings as they were understood by the participants in my study. Thus, in addition to designing a method that resonates with the study’s theoretical underpinnings, I have also sought to account for my beliefs and recognize the places “where self and subject are intertwined” (Peshkin, 1988, p. 20). Throughout this journey I have written personal memos reflecting on my process, especially when certain feelings or hunches became particularly salient and obtrusive to my thinking. I have shared the contents of memos with my advisor as part of our weekly meetings. This sounding board has helped me to become more aware and intentional when making choices about how to proceed.

**Research Design**

My goal has been to understand processes that are intangible. By observing behavior, a researcher can attempt to understand the relationships we build and the environmental factors that capture our interest and entice us to engage. However, any study that attempts to isolate behavior alone will miss the meaning that participants attach to their actions. This makes a naturalistic inquiry an appropriate fit for this study. In explaining the role of studying behaviors in naturalistic inquiry, Guba and Lincoln (1982) said that, “it is not these tangibles that we care about, but the meaning and interpretation people ascribe to or make of them, for it is these constructions that mediate their behavior” (p. 239). My goal in this study has been to unpack the complex relationship between engagement and relationship building in the classroom, which I was able to understand better through a context-rich, naturalistic exploration.

The classroom is a common context in which students and teachers experience the processes of engagement in learning and relationship building. This was a well-bounded context, which made a case study method well suited to my purposes (Merriam, 1998; Miles &
Huberman, 1994). In this particular study, the process by which students and teacher expressed value for particular learning opportunities varied among the different participants. A classroom provides a common learning environment, but each person in that classroom internalizes slightly different meanings from experiences within that environment because of his or her past and variations in what draws one’s attention. Thus, the “in-depth data collection involving multiple sources of information rich in context” (Creswell, 1998, p. 60) inherent to a case study design helped me to address the challenge of disentangling the layers of experience and meaning that evolved for each study participant.

**Research Site and Participants**

The setting for this study was one 9th grade science classroom. This class was taught by Mr. Green, a teacher with 15 years of experience at Wellborne Academy.

**Site and teacher.** For the purposes of this study, I chose a case in which I could observe the development of relationships between the teacher and his students from the inception of these relationships. Many high school settings present a challenge to this goal because students already know each other from previous classroom settings or community activities. Additionally, students often know about their teachers through word of mouth or previous direct experiences with the teachers themselves as coaches or club advisors. Given these obstacles, I chose to study a 9th grade classroom at a private boarding school. These two choices increased the probability that the students did not know each other or the teacher directly, and they minimized what students knew about the teacher before entering his class. In this case only two of the twelve students in the class had older siblings at the school through whom they might derive pre-conceived notions about the teacher.
The second consideration in choosing a case for this study was to combat my “nativism” as a researcher. I wanted to avoid a situation in which the students or teacher may have perceived me as knowledgeable about the content of the class. I wanted, as much as possible, to promote the notion—in fact and in perception—that I needed to learn from the participants, not the other way around. By choosing a science classroom instead of a social studies classroom, I was more easily able to ask for continued clarification and explanation from my participants without seeming disingenuous.

The third consideration I took into account when choosing a site was maximizing my ability to access a rich and varied set of data. In addition to observing this class every time it met, it was also important for me to hear students’ perspectives on their experiences as much as possible. The setting of a boarding school where I also lived provided an excellent opportunity for me to find and talk with students individually and in small groups when they had free time. Only four of the students in this class were day students, and two of these four students were frequently around until quite late each day, so I was able to walk to their dorms or invite them to meet in an empty classroom to chat on a regular basis. Cell phones and walking distance between where students lived and our meeting places also made it possible for students to remind each other when a student forgot about a focus group meeting and still get that student to show up in time to participate.

Finally, the last consideration in my site selection was the opportunity to observe a teacher grapple with the challenge of trying to engage high-ability and average learners in a heterogeneous classroom. The class I chose was at a boarding school that had given up teaching AP level classes as of the 2016-17 school year. School administrators were promoting the integration of formerly tiered classes. In line with this vision, the science department had chosen
to collapse the 9th grade experience, which had formerly been bifurcated into honors and regular science offerings. I was particularly interested in understanding how relationships and engagement evolved for students when there were a variety of ability levels present in the same classroom.

Given all of these considerations, I chose to work with Mr. Green, a 9th grade science teacher, at Wellborne Academy. Wellborne is a selective New England boarding school founded in the late 19th century. It is co-educational with approximately 360 students from around the country and the world. As a spouse of a history teacher at Wellborne, I have easy access to the community without being fully of the community. Mr. Green has been a science teacher at Wellborne for 15 years. Based on informal conversations with students and faculty before my study began, I developed the impression that Mr. Green was well respected as a teacher who has had success with engaging students. I also ascertained that he is respected among his colleagues as a reflective teacher, always willing to “talk shop.” Given all of the other considerations listed above and these impressions, Mr. Green and his 9th grade class seemed like a good fit for this study.

**Student participants.** There were 12 students in Mr. Green’s class, 11 of whom agreed to participate fully in the study. The final student agreed to be video-taped, but I did not speak with him. Of the students in this class, one was a student of color, two were openly LGBTQ students, all were able-bodied, and all spoke English as a first language; they came from 7 different states, but 9 of the 12 lived in New England. Four of these students were day students who left campus in the evenings to return home.

**Consent**
Before the school year began, I provided Mr. Green (in person) and the parents of the students scheduled to be in Mr. Green’s freshman class (via email) copies of the consent paperwork and an explanation of the study. During orientation week, I sat in the registration room at Wellborne Academy to answer any questions from parents and students face-to-face and collect signed consent and assent forms as families arrived to drop their children off at school. The consent paperwork offered students two levels of participation: level one would include only classroom observations and video recordings but no further contact with the student; level two would include level one as well as students providing me with written exit slips at the end of every class period, access to talk one-on-one during weekly check-ins, participation in weekly focus group interviews, and participation in a formal one-on-one interview at the end of the study. Of the 12 students in Mr. Green’s class, 11 agreed to level two participation, and one opted for level one. I also brought and obtained signed assent forms for the students before each focus group and final interview so as to remind them of their right to decline to speak at any time.

Data Collection

To understand the processes of engagement and relationship building in the classroom, I collected data in a variety of ways. I did this not only to triangulate and immerse myself in the classroom culture, but also to capture the participants’ proximate and distal (i.e., more reflective) perceptions on the interactions between teacher and students that happened in the classroom. Table 3.1 offers a brief overview of the myriad data that I collected in this study.

Table 3.1

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Structure</th>
<th>Amount &amp; Dates</th>
<th>Participants</th>
</tr>
</thead>
</table>

53
<table>
<thead>
<tr>
<th>Data Type</th>
<th>Description</th>
<th>NumberOfDataSets</th>
<th>DataPeriod</th>
<th>DataOwner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class observations &amp; field notes</td>
<td>80-minute class periods met every other day. Researcher sat in the back of class and wandered around when students were working independently.</td>
<td>22</td>
<td>Sept. 8 – Nov 17</td>
<td>All</td>
</tr>
<tr>
<td>Class audio/video recordings</td>
<td>1 GoPro© camera affixed to the ceiling above the front board, 1 GoPro© camera in researchers hand (when walking around), and 1 Swivl© camera trained to the teacher recorded entirety of class sessions.</td>
<td>22</td>
<td>Sept. 8 – Nov 17</td>
<td>All</td>
</tr>
<tr>
<td>Student exit slips</td>
<td>Sheets of paper with prompts to write references to “really interested/engaged moments” and “really bored/not engaged moments” from class. Handed out and completed in the last 5 minutes of class.</td>
<td>19</td>
<td>Sept. 8 – Nov 17</td>
<td>All students</td>
</tr>
<tr>
<td>Individual student check-ins</td>
<td>5-10 minute face-to-face conversations between researcher and individual students (notes only, no recording) during study hall hours (8-10 p.m.)</td>
<td>Researcher walked to each student’s room once a week for 7 weeks.</td>
<td>Available students</td>
<td></td>
</tr>
<tr>
<td>Student focus group interviews</td>
<td>30-60 minute, video-recorded interviews with 3-5 students. 10 minutes worth of video clips from the preceding week of classes used as prompts for discussion.</td>
<td>2 sessions held each week for 7 weeks (14 sessions total, students could only participate in 1 each week)</td>
<td>Available students</td>
<td></td>
</tr>
<tr>
<td>Final one-on-one student interviews</td>
<td>30-60 minute, video recorded interviews with students, one-on-one.</td>
<td>1 per person between Dec 3-12</td>
<td>All students</td>
<td></td>
</tr>
<tr>
<td>Teacher Interviews</td>
<td>30-60 minute, video recorded, face-to-face interviews. First and last were prompted with questions. Other interviews were prompted with video clips used in focus groups.</td>
<td>1 on Sept. 8; weekly between Sept 30-Nov 18 (7 total); 1 on Dec 16</td>
<td>Teacher</td>
<td></td>
</tr>
<tr>
<td>Teacher email communication with students</td>
<td>Teacher shared electronic copies of emails he sent to students about their class work/performance.</td>
<td>5 sets of emails (1 to each student per set)</td>
<td>Teacher</td>
<td></td>
</tr>
</tbody>
</table>
between Oct. 3-
Nov 18

Data collection began on the first day of classes with observation, field notes, video recording of class and an interview with Mr. Green. This was a class that met every other day for approximately 80 minutes. On the second day the class met, I began collecting exit slips from students at the completion of each class period. By the third week of classes, I began interviewing students through informal one-on-one check-ins on Monday nights and video-recorded focus groups, usually held on Thursday evenings. I used my field notes, data from student exit slips, and data from individual check-ins to identify clips from classes each week to compile into a discussion-prompting video for the focus groups. During week three, I also began interviewing Mr. Green on a weekly basis with the same video clip prompts I used with the students in focus groups. Throughout the fall term, Mr. Green also gave me copies of all written feedback that he shared with students. I collected data in this manner for the entire fall term (10 weeks of observation, 7 of those weeks including interviews). The fall term ended at Thanksgiving break. When students returned from this week-long break, I set up individual interviews with each of them and Mr. Green in the 2 weeks between Thanksgiving and Christmas breaks.

**Classroom observations.** Classroom observations, combined with field notes and video recordings of each class, served as the starting point for data collection in this study. I used three separate video cameras to capture all but one class meeting in the fall term. One camera was affixed to the ceiling at the front of the classroom and captured virtually all action within the classroom except for when the teacher walked right up to the board at the front of the room. A second camera was positioned at the back of the room and connected to a wireless microphone that the teacher wore so that when he moved, the camera rotated with his movements and caught
his audio more consistently. Finally, I carried a small GoPro© camera with me when the students broke into small group work and/or went outside. The GoPro© camera I carried with me and the one that was affixed to the ceiling measured under 3 cubic inches and were relatively unobtrusive.

Wellborne Academy runs on a block schedule within which classes meet for 80 minutes every other day. I had to miss the 16th class of the term (October 28th), but otherwise I was present and able to observe and record the other 22 classes of the fall term beginning on September 8th and ending on November 17th. I documented my field notes from these classes in a two-columned manner whereby I kept my impressions, questions, and reactions separate from my observations so that I could more easily reflect on these in memos that I shared on a weekly basis with my advisor.

**Student exit slips and check-ins.** I used two methods of eliciting initial, personal impressions from students about salient moments of engagement and disengagement in class activities. Given the constraints of the host school and participating teacher, I could not interrupt class activities to inquire about student impressions while in situ. Collecting data through exit slips and in-person check-ins offered me a way of balancing temporal proximity and substantive reflection when initially inquiring into student perceptions. Beginning with the second class period and continuing until the end of the term, each student participating in level two of the study completed a brief exit slip at the very end of each class. The exit slip asked the student to share any moments in which he or she was (a) really interested/engaged, and (b) really bored/not engaged. 

1 Additionally, I walked around to student dormitories each Monday night at the beginning of study hall (8-10 p.m.) to follow up on what each student had written on his or her

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1 In addition to the first class of the term, I was unable to collect an exit slip on the class period I missed, a class period during which the students had a test, and one class period in which the teacher’s lesson plan ran late. This meant I collected 19 exit slips for all but one student, Cody, who missed two classes. He submitted slips for each of the 17 classes he attended.
exit slips and what I had noted in my field notes over the preceding week of classes. These “check-ins” were conducted individually,² were not video-recorded, and lasted approximately 5 to 10 minutes. By the next morning, I emailed my field notes from these meetings to the students for them to member-check. Even though I emailed the students during the day every Monday to confirm my visit, some of them neglected to inform me that they had plans to visit the library or a teacher during study hall, so not every student participated each week (see Table 3.2).

The individual check-ins proved much more fruitful than the exit slips. Students usually filled out exits slips sparsely, but during check-ins I was able to ask follow-up questions like, “I’m not sure I understand, can you tell me more?” Once students had experienced participation in the focus groups, I was also able to position myself as a “student” to their expertise by asking them to help me figure out which clips of class I should use to inspire good discussion in the weekly focus group discussions.

Table 3.2

<table>
<thead>
<tr>
<th></th>
<th>Sarah</th>
<th>Ellen</th>
<th>Eric</th>
<th>Zach</th>
<th>Megan</th>
<th>James</th>
<th>Jason</th>
<th>Todd</th>
<th>Cody</th>
<th>Maggie</th>
<th>Sophie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check-ins</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Note: the maximum number of opportunities to participate was seven for each.

Student focus group interviews. In addition to exit slips and check-ins, the bulk of student reflection data for this study came from seven weekly focus group interviews that began in the third week of the school year and ran through the end of the term. Unlike an individual interview, a focus group centers the conversation on a collective activity (Kitzinger, 1994). As a

² Megan and Ellen were roommates, so five of their check-ins were conducted together. Similarly, James and Todd had adjacent rooms and often worked together during study hall, so four of their check-ins were together. Cody, Jason, Sarah, and Zach were day students. Cody and Jason were difficult to coordinate with, and so I was unable to conduct check-ins with them; Sarah and Zach’s check-ins happened in semi-private corners of the student union during study hall time.
stimulus for each focus group, I showed approximately 10 minutes of audio-video footage from classes over the preceding week (6 clips that lasted 1-2 minutes each). Each video clip (usually 6 per session) was chosen because of its salience as an “interested/engaged” or “bored/not engaged” moment to the students. I elicited student nominations for these clips from reviewing exit slips and notes from individual check-ins. I then vetted these nominations and tried to present a balance of interested and bored clips, a variety of different kinds of activities/interactions happening in the clips, and clips from as many class periods as possible (see Appendix B). At the beginning of each focus group session, I reminded students that I was interested in any ideas, feelings, or reactions they had when watching the video clips that might help me understand what kind of engagement they had experienced and what was influencing their engagement. I also asked them to share ideas whenever the spirit moved them, and I paused the video whenever someone began to speak. I often paused the video and asked students to explain if they had a visibly emotional response to a particular moment as well (e.g., laughing or eye rolling and sighing). Additionally, I paused the video at the conclusion of each clip and waited for responses. Sometimes I would ask students to clarify or expand upon their thoughts. If students were less talkative, I would ask what they thought of a fellow speaker’s ideas.

I attended to grouping design details to encourage as much open participation as possible. To maximize the focus groups’ social benefits, I grouped students by emerging social subgroups. Kitzinger (1994) noted that pre-existing social groups are a helpful basis for forming focus groups because they are people who would already tend to talk about life experiences together, and “they provide one of the social contexts within which ideas are formed and decisions made” (p. 105). Friends are more likely to help a speaker clarify what she is saying, challenge a speaker when his words and observed actions don’t align, and jump in to build on each other’s comments.
(Kitzinger, 1994; Raby, 2010). To identify subgroups of students aligned with naturally occurring social networks, I paid attention to things like where students chose to sit, who worked together, and who walked and talked together before and after class. I also asked students if they were comfortable with the group I had planned for them and offered to make a change if they were not comfortable. Due to my uncertainty about their social networks, I did not invite Eric, Jason, or Sophie to a focus group session until the third focus group; from then on I invited all students each week. To encourage all students to participate in the focus group while still having enough dialogue to inspire substantive interaction with each other, I invited no more than six students to any one focus group. This meant that I ran two separate focus groups each week. Given the students’ schedules, they were not always able to attend, but no focus group was ever smaller than three or larger than five students (see Table 3.1 and Appendix B).

**Student final interviews.** As a capstone to my data collection, I arranged individual, semi-structured, video-recorded interviews with each student participant. Each of these interviews was conducted during the 2 weeks between Thanksgiving and Christmas break and lasted anywhere from 30 to 60 minutes. I met students in the same classroom we had used to conduct focus group interviews, but rather than using video clip prompts, I asked the students questions about their experiences in Mr. Green’s class over the past term (see Appendix C). In this interview, I asked students to reflect more on the quality of their relationship with Mr. Green. I also tried to raise topics they had raised in previous focus group sessions to see to what extent their perspectives may have shifted over time.

**Teacher interviews and communication.** To help me understand how Mr. Green’s perspective on engagement and relationships with the students was evolving over time, I interviewed him on a weekly basis as well. All interviews were video recorded, were conducted
in his semi-private office, and lasted from 30 to 60 minutes. Before classes began, I conducted a semi-structured interview in which I asked Mr. Green to explain his pre-conceived beliefs and values regarding the ways he hoped to engage students in the class (see Appendix D).

Throughout the term, I also conducted semi-structured interviews with Mr. Green that paralleled the student focus group sessions. Each week during our interview, I provided Mr. Green with a laptop that had the same video clips as the ones used in the student focus groups and asked him to respond in similar fashion to the students. I asked Mr. Green to pause the video whenever he felt an idea come to him regarding how the students seemed to be engaging and how he was thinking and feeling about trying to facilitate their engagement process. Finally, during the 2 weeks between Thanksgiving and Christmas breaks, I also conducted a final semi-structured interview with Mr. Green in which I asked him to reflect more intentionally on his relationships with the students as well as his perceptions on the engagement process with this particular class (see Appendix E).

In addition to interviews with Mr. Green, I collected artifacts of his direct communication with students about their work. Mr. Green grades all of his students’ work online and then emails them holistic comments. He shared each of these sets of comments with me (five per student over the fall term). He also shared copies of official notes that he entered into the school’s online student database. These are spontaneous notes that teachers share when an issue of concern arises and they want to make sure all teachers, dorm parents, coaches, etc. are in the loop about an issue going on with a student. I also obtained the final report card comments that Mr. Green wrote for each student at the end of the term. I reviewed these data holistically as I received them to identify topics that I might follow up on during check-ins or focus group interviews.

**Data Analysis**
Given the variety and volume of data I collected in this study, I pursued many analysis layers. This work was iterative and non-linear (Miles & Huberman, 1994). Within the descriptive phase of data analysis, I unitized, indexed, coded, categorized, and subcategorized the data. Throughout this process, I wrote a variety of descriptive and analytic memos that I shared with my advisor during our weekly meetings. Writing memos helped me to identify ideas for how to code, organize, and reflect on the data. These ideas sent me back to revisit the data multiple times. I tested ideas until clarity began to emerge. After the descriptive phase, I created matrices to help me discover patterns in the explanatory phase of analysis. Throughout data analysis, I consulted with others and wrote memos as part of the process of deepening the trustworthiness of my findings.

**Reviewing Notes and Planning for Focus Groups**

I began my analysis process as I was still collecting data to help ensure that I collected a robust set of data. I reviewed my field notes and the students’ exit slips after each class period to make notes of moments of activity that might be potentially complex and salient to understanding the process of student engagement and teacher-student relationship building. These notes helped me to follow up with students during individual check-ins to ask for more clarification or elaboration on their perspectives. I reflected on my class period notes and the further notes I took during individual check-ins to help choose the video clips that I used for the prompt in the focus groups each week. I also made notes of possible follow-up questions for the video clips I used in the focus groups. After each focus group, I reviewed notes I made to develop follow-up questions I might be able to ask in subsequent check-ins or interviews. One example was when I noticed students were using a variety of words to describe less engaged experiences in class; this inspired me to compile a list of these words and ask students at the next
focus group session if they all meant the same thing or if they had slightly different meanings. This led to dialogue between the students as they negotiated and helped me to see more clearly into the meanings they had constructed around these words. This iterative process helped me to glean more fruitful data as the weeks progressed.

**Transcription**

My transcription process included action scripting as well as verbal transcription. For each video clip that I used in a focus group, I used italic font to describe the action of what was happening as well as regular font to transcribe what was said. This allowed me to have a written reference of the actions and behavioral responses of the participants in conjunction with their words. I then copied and pasted these “scripts” from each video clip into the left hand column of a two-column template in version 14.7.3 of Microsoft Word (2011). I used copies of these templates to transcribe the focus groups and teacher interviews in the right hand columns. I inserted line breaks on the left hand “script” and left space between the text on the left-hand side whenever a participant had interrupted the video clip in the actual interview to say something. I would then transcribe what was said on the right in the space that was adjacent to the gap on the left side. In this way, I helped retain the contextual references of participants’ comments in the interview transcripts. Furthermore, when I transcribed the focus group and teacher interviews, I once again used italics to describe non-verbal communication such as nodding, rolling eyes, laughing, and mimicking body postures. This level of detail aided my reflections on the transcriptions by helping me to consistently capture observational data.

**Memos**

While I was transcribing, my data analysis took the form of regular memos on emerging ideas that struck me most saliently. Every time I thought I was seeing a pattern in the data, I
wrote a memo about it. I used these memos to foster conversation with my advisor each week. My advisor frequently encouraged me to “stick a pin” in my ideas. I found that writing each idea as it came to me allowed me to let it go more easily so that I could continue to be open to new ideas, and I did not develop tunnel vision for only seeing data that fit my initial ideas. This process continued after I finished transcription while I re-read the data holistically. These memos and conversations helped me decide on a system for conducting my initial coding.

**Unitizing Data**

My first step in coding was to unitize the data by conversational turns. I printed off the transcripts from each week’s worth of focus groups and teacher interview onto paper of different colors for each week. This allowed me to keep a chronological “tag” on each data point. After that, I cut out each conversational turn. A conversational turn refers to one or more students who commented on the same class event in succession (or sometimes simultaneously with non-verbal communication) and indicated a mutual understanding of how they experienced the event in question. Thus, a conversational turn could involve more than one student talking about the same event, but if two or more students indicated different experiences of the same event those comments would count as a separate conversational turns. Frankland and Bloor (1999) suggested that, when working with focus group data, researchers should retain the conversational context of participant’s comments. This allows the researcher to reflect on the magnitude or popularity of a particular feeling or opinion as well as identify potential instances of groupthink. Groupthink, or the propensity for people to agree with others for the sake of promoting harmony within the group, was a reasonable concern given the fact that I was interviewing teenagers who had just recently met each other and were adjusting to living with each other.

**Indexing Data**
I applied a grounded approach to the data as part of my initial analysis. Merriam (2009) affirmed that a grounded approach to data analysis can be applied to a case study. Furthermore, the unitization I did based on conversational turns was similar to the “incident by incident” unit that is sometimes used in initial grounded coding (Charmaz, 2014). Based on all of my memos and conversations with my advisor during data collection, transcription, and holistic re-reading of the transcripts, I tested an initial indexing scheme for the data. As I cut out each conversational turn, I placed it in one of three piles: helps (i.e., facilitators of engagement), hinders (i.e., things that inhibit engagement), or other (i.e., everything else that seems relevant to the study). During this process, after reflecting on the other pile with my advisor, I decided to add two more indexing codes: evidence of engagement (i.e., descriptions of being engaged or not) and purposes for engagement (i.e., beliefs about ideal ways in which students should be engaged in this class). When I revisited the data in the other pile to sort into these new categories, it diminished the other pile to a negligible size.

After this initial indexing process, I applied a combination of in vivo and descriptive codes to the data within each indexical category. In the initial round of grounded coding, it is helpful to retain participant voice as much as possible and simplify language (Charmaz, 2014). In vivo codes helped to retain participant voice, while descriptive codes helped me to simplify language when a participant’s idea became too complex or verbose (Saldaña, 2013). I wrote these initial codes in pencil on the back of each slip of paper. After I coded each data point in this way, I took each indexical category separately and worked on focused coding.

**Creating Categories**

During my initial attempt at focused coding, I discovered some challenges embedded within my initial coding process for the “help” and “hinder” indexical categories. At first, I
created conceptual categories inductively based on the initial round of codes. The descriptive findings from the evidence of engagement and purposes for engagement, indexes each emerged because they did not fit the initial “help” and “hinder” indexical codes. In the midst of organizing the data from the helps and hinderers indexes, I realized that my initial codes, which were more in vivo, were coalescing in categories that reflected teacher moves more clearly (e.g., “teacher provides instructions”), whereas the codes that were more descriptive were coalescing in categories that tended to reflect activities or resources (e.g., “technology is hard”). At this point, I re-read a number of the original data points. I discovered that there were also references to teacher moves in most of the conversational turns that had descriptive codes, but the inverse was not always true of the in vivo coded quotes. I decided I had obfuscated the presence of participants’ beliefs about the effects of teacher moves when I had applied descriptive codes based on class activity or resource. Thus, I returned to the original data and re-coded these data at the initial level with reference to teacher moves as much as was possible in the helps and hinderers indexical categories.

Theoretical Coding

After this iteration of data analysis during which I re-aligned the initial codes within the helps and hinderers indexes, my focused coding led me to apply a round of theoretical coding (Charmaz, 2014). In this case, theoretical coding was a way of organizing the data in the original indexes of helps and hinderers into categories based on the types of teacher moves that the teacher enacted which addressed the three psychological needs of autonomy, competence, and relatedness from self-determination theory. These categories were autonomy support, structure, and involvement on the facilitative side and control, chaos/understimulation, and alienation on the inhibitive side. I also included other-positive and other-negative to capture all subcategories.
that did not fit this scheme. My theoretical coding was guided by my knowledge of the literature, but I stayed open to the particular and emergent qualities of the subcategories I was organizing to define the bounds of these eight categories in my codebook (see Figure 3.1).

**Autonomy Support:** teacher provides students with: choice; ownership; relevancy to personal values/interests/lives (interesting, fun, or cool ideas); real life application; sense of agency; meaningful purpose; the teacher is hands-off; student understands and accepts teacher’s goals; teacher allows student to do things their way even if the teacher knows they’re making a mistake; teacher adapts to the direction student goes in; teacher is flexible; teacher allows student to figure things out on their own.

**Structure:** teacher provides enough structure/guidance so student feels like s/he knows how to do something productive; teacher provides a do-able challenge; student feels able to accomplish teacher’s goal; teacher makes student feel safe to make mistakes; teacher provides interactive activities requiring eliciting responses, input, or feedback; teacher provides activities that are hands-on, doing something, requiring movement and clear actions.

**Involvement:** teacher makes student feel seen, heard, affirmed, validated, respected, and/or connected to the teacher; students experience enjoyable social interactions with the teacher (affection for the teacher); student feels like the teacher cares about the student’s success.

**Other-Positive:** peer support

**Control:** Too much teacher-direction; student feels s/he didn’t have a choice; there was no point/purpose that was relevant or meaningful to the student; teacher’s process felt like an unnecessary way of doing things to the student (discomfort without a purpose); the teacher says what he wants without an attempt to make it meaningful or purposeful to the student; teacher activities are laborious without a clear purpose or interest to the student.

**Chaos: Understimulated:** the teacher did not provide enough structure or guidance for the student to know what to do or how to start; an activity provided by the teacher felt too overwhelming to the student (paralyzed by a challenge that’s too hard); the teacher’s instructions felt unclear or confusing; the teacher expected students to act but the student didn’t know how to act or what to do; the teacher provided task was too easy, the stakes were so low that there was no pressure to perform, respond, or think; the teacher’s instructions were repetitive; the teacher overcomplicated a task.

**Alienation:** the teacher neglected the students; the teacher did not hear, see, or listen to students needs; the teacher ignored the student’s perspective, opinion, or needs; the teacher rejected or disregarded the student’s voice; the teacher de-valued a student’s experience; the teacher dismissed a student’s effort; he teacher showed annoyance, anger, or hostility towards students; the teacher showed disinterest (e.g. monotone presentation) in task and/or students; the teacher asked students to do something embarrassing.

**Other-Negative:** weather, time of day; student was tired; outside events distracting; peer anxiety; extrinsic motivation (i.e. grades, deadline, teacher monitoring behavior)
Figure 3.1. Except of codebook definitions for theoretical categories within the *helps* and *hinders* indexes of data.

**Creating Subcategories**

After organizing the *helps* and *hinders* data into theoretical categories based on self-determination theory, I pursued a process of axial coding the data within each theoretical category. I organized the data in each theoretical category based on similar in vivo codes and then re-read the original quotes again. At this point, I went back to using Microsoft Word (2011). I copied and pasted each of the original quotes in each of the eight theoretical categories into a document while labeling quotes by week (e.g., “FG1” to refer to a quote from a focus group interview in week 1). Then I rearranged quotes that seemed to reflect similar ideas. I began to label these emergent categories in a similar fashion to the in vivo/teacher moves labels I had used before. I pursued yet another layer of categorization, however, which captured the essence or spirit behind the teacher moves in a succinct way. I went back and forth, parsing and subsuming data within each theoretical category of teacher moves until clear concept labels emerged and the teacher moves subcategories captured the full dimensions of each theoretical concept (see Figure 3.2).
Empathizing
- T listens to Ss, gives benefit of doubt to Ss
  - FG1
  - James: Yeah, I think that clip showed that, I guess, how empathetic Mr. G is because he was open to the fact that like he probably made a mistake on the video. So a thing like that gives students a chance to voice their reason for why they put the wrong answer, I guess. So, like, it makes it easier for people to raise their hands and explain themselves.
    - Zach: (nods) yeah, definitely
  - FG3
  - James: I like how understanding he is because, well in the clip, I was asking him if 14% was a good error. Obviously he didn’t like 14%, and he wanted me to go back and do it again, but I had already taken my measurements down again three times, so I’d been outside a lot, and I told him that and he understood how like, I guess, that was putting in effort but there was just something wrong that he couldn’t see so he said that it was fine. Like, he told me to go over it but he told me that it was fine that I got that number. So it shows that he’s understanding of the struggles that we have.
    - Jason: Agree

Figure 3.2. Excerpt from axial coding document that helped produce subcategories for teacher moves within the eight theoretical categories of the helps and hinders indexical categories. This excerpt is from the involvement theoretical category in the helps index.

After working through the iterations of initial and focused coding for all of my data indexes, I looked for saturation. To test the saturation of the conceptual categories and subcategories in each of my indexes, I re-read the transcripts of the final interviews, to which I had yet to apply any formal coding. I looked for examples of helps, hinders, evidence of engagement, and purposes for engagement to see if they all fit in the conceptual categories I had created. Upon re-reading the final interview transcripts, I discovered that they contained some indexical data that none of the weekly interview data did because of the nature of the pre-planned questions I had asked in the final interviews. The data that were most relevant to my research questions and that were not encompassed by the original indexes fit into an index I called quality of teacher-student relationship. I unitized these data by conversational turns (in this case, that
only included comments from one participant with possible interjections from me as the interviewer). Then I applied in vivo initial codes to these conversational turns and organized them into themes through focused coding and re-read the data to make sure I had accounted for all possible instances of each theme. At this point, I felt the descriptive phase of my data analysis had progressed to a sufficient level for me to explore the explanatory phase of analysis by constructing matrices.

**Matrices for Explanation**

As I had been working in the descriptive phase of analysis, I wrote memos and talked with my advisor about the dearth of change over time evidence I was seeing emerging from the data. Rather than artificially force a time-ordered pattern on the data, I created matrices to explore different types of patterns in the data. For these matrices, I focused on the data from the “helps” and “hinders” indexes. I began this process by creating a grid with a row for every video clip from each of the 7 weeks. There were 41 separate video clips. The columns represented each of the eight categories of theoretical codes from the “help” and “hinder” indexes. Within each cell, I placed the name of a student every time I found a reference he or she made in a conversational turn that was coded in one of these eight categories (see Appendix F). I used normal text when a student initiated a conversational turn, parentheses around a student’s name to keep track of when a student was responding in agreement to a comment someone else had initiated in a conversational turn, and brackets to track when a student initiated a conversational turn that referenced a teacher move not illustrated specifically in the video clip provided. This grid helped me to reconsider the challenges and advantages of focus group data. By noting all instances of students who made or agreed with comments, I could get a better sense of
magnitude, and by distinguishing initiators of conversational turns, I could try to account for possible group think biases.

**The first matrix: Seeing differences between students.** I used this grid in conjunction with memos and advisor discussions to decide on two fruitful paths for further explanatory analysis. I created subsequent grids to help flesh out some of the parameters for each of these two paths. On the first path, I explored the differences among students in terms of what kinds of teacher moves they mentioned. First, I counted the number of times each student initiated a conversational turn and organized these into three categories reflecting the basic psychological need being addressed by what the student had chosen to note in that teacher move (see Table 4.4). I collapsed autonomy support and control moves into the autonomy category, the structure and chaos/understimulation comments into the competence category, and the involvement and alienation comments into the relatedness category. I also totaled the comments by student and calculated percentages to determine how frequently they initiated a comment in each of these three categories. Furthermore, I totaled the comments in each column and calculated class averages for how many comments were made in each category. This allowed me to look at the diversity between students in terms of their propensity to notice certain teacher moves over and above other students. I excluded student comments where they did not initiate the conversational turn to try to account for the possibilities of group think and capture data that reflected what was most salient in the respondent’s mind rather than what she/he assented to only after the idea was triggered by someone else.

After computing this student diversity table, I identified that some students had, indeed, demonstrated a propensity towards making more comments related to certain basic psychological needs more than others. For each of the students whose percentages were well above the class
average for a particular column, I went back and re-read comments from those students that fell into that particular category. From these students I chose two or three representatives per column based on how much their comments brought diversity and nuance to understanding the range of situations in which these students countered the trend of how other students were speaking about the teacher’s moves. Then I created matrices that included data on the speaker, the comment, the week, the activity to which the speaker was responding, and notes about the dominant opinions from other students in that focus group on the same activity. From these matrices, I developed themes that allowed me to explain differences among the students in terms of how the teacher’s words and actions influenced student perceptions about the engagement process in different ways.

The second matrix: Seeing differences between teacher and students. The second major, explanatory path I traversed was an exploration of differences in how the teacher versus a substantive number of students perceived the effects of the teacher’s moves on the engagement process. In other words, I wanted to look at instances when what the teacher perceived as the effects of his actions on student engagement was distinctly different from what a number of students perceived were the effects of his actions on their engagement. For this process, I created a matrix that allowed me to see patterns of similarity and differences among all of the participants. In this matrix (see Appendix G), I once again used each video clip as a row. In this case, however, each participant was a column, including the teacher. Each cell contained an E and or a D to indicate whether the student had indicated he or she felt engaged, disengaged, or both (or whether the teacher believed that students were mostly engaged, disengaged, or both) during the events of that video clip, and then I wrote the theoretical category or categories that subsumed the reasons why next to the E and/or D. This matrix allowed me to identify video clips
in which there was substantial disagreement between the effects that the teacher thought he was having on the students and what a number of students felt were the effects of the teacher’s moves.

After identifying video clips that contained substantive differences between teacher and students’ perceptions, I created one more matrix to see in-depth what was happening in those video clips. For this matrix I summarized the events and micro-moments of activity from the video clip in the first column, the interview quotes about perceived causation from the teacher in the second column, the focus group quotes about perceived causation from the students in Focus Group One in the third column, and the focus group quotes about perceived causation from the students in Focus Group Two in the fourth column (see Figure 3.3).

![Figure 3.3. Example of in-depth teacher-student diversity matrix.](image_url)

In reflecting upon this matrix, I identified patterns in the micro-moment activities that seemed to inspire similar disagreements between the teacher and a number of students. I tested these themes across the other video clips with the most diversity and recursively developed the
explanation until I could account for all of the diversity where a similar pattern appeared in at least two different video clips.

**Trustworthiness**

In a naturalistic study, the “truth” value of the study should be measured by how well my analyses are rooted in the data. I checked the credibility of my findings in a number of ways. First, I triangulated my data collection from a variety of sources (Maxwell, 2013; Miles & Huberman, 1994). My ideas about student and teacher perceptions were informed by observational data, written documents, individual conversations, and, in the case of the students, focus group discussions. This rich array of data complicated my thinking and helped me avoid the trap of mistakenly taking a comment at face value (Guba & Lincoln, 1982). In addition to collecting a variety of data, I also asked the participants to member check any field notes I took when I did not have video recordings to confirm their words. Thus, I returned to the source to double check my impressions (Guba & Lincoln, 1982).

Guba and Lincoln (1982) suggested that confirmability, or the ability to confirm that the findings of a study are rooted in the data rather than the biases of the researcher, is an important check to conduct while one is engaged in a study. Throughout the research process, I asked outsiders to help me check my subjectivities and the consistency of my analysis process a number of times. Over the course of my study, I wrote memos on a regular basis about my instinctive ideas that emerged when reflecting on the data. Each week, I reconsidered these ideas with my advisor. At some points, she helped me to “put a pin” in these and stay open to new ideas, rather than get bogged down in tunnel vision around one or two. I brought excerpts of data to my advisor when I felt unsure or got stuck with something. Sometimes these conversations helped me to reconsider outliers and pursue different paths for thinking about surprising data
(Miles & Huberman, 1994). At other times, she questioned my coding decisions on these data, which helped me to identify fruitful paths for re-iteration. For example, when I was working in the initial coding stage, one of these conversations helped me to identify the purposes for engagement index that illuminated a line of understanding from the teacher interviews.

Other outsiders helped check my coding decisions as well. Once I coded all of the data within the helps and hinders indexes into the eight theoretical buckets, I asked a post-doctoral researcher with experience in coding qualitative data from teenagers to use my codebook to code approximately 10% of my data. After we clarified the instructions, agreement was approximately 69%, and after further discussions we came to 100% agreement in how the data should be coded. After I had conducted axial coding within each theoretical category to identify the types of teacher moves and their properties, I asked an outside reader to review my category concept labels, property labels, and the original data quotes subsumed within each one and suggest inconsistencies in my analysis. This outside check helped me identify places where I rearranged and subsumed some of the data further to re-articulate some labels in more precise ways. Finally, talking through the matrices I developed with my advisor and other outsiders helped me to reconsider and reiterate the way I was looking for patterns in the teacher-student diversity matrix.

Limitations

First and foremost, the nature of this study meant that I was quite possibly influencing participant engagement because I was asking them to reflect on their experiences. The very fact that I was collecting a significant portion of my data by asking the participants to reflect with each other and with me meant that in the process of finding words for their ideas, they were engaging in a process of reconstructing their perceptions of their experiences. One way I sought
to mitigate my intervening influence was to minimize my verbal contributions during interviews.

I frequently asked students to respond to each other rather than offering responses when they spoke. Also, I resisted the temptation to offer judgment of participant comments; one way I sought to do this was by asking follow-up questions such as, “Could you tell me more?” or “Could you give me an example of what you’re saying?” rather than offering guesses of what I thought they might be saying. Despite the limitations of collecting data in an interactive manner, I believe that the benefits still outweigh the costs. As Guba and Lincoln (1982) said,

If interactivity could be eliminated by some magical process, the naturalist would not think the tradeoff worthwhile, because it is precisely the presence of interactivity that makes it possible for the inquirer to be a ‘smart’ instrument, honing in on relevant facts and ideas by virtue of his or her sensitivity, responsiveness, and adaptability. (p. 240)

A practical limitation to the study was the constraint of imperfect access to the participants. Ideally, I would be able to access participants’ perceptions of their experiences during or immediately following the experience. This was not practically possible given the primary and prevailing purpose of the classroom. I could not interrupt the flow of learning. The closest I could get was when the teacher and school agreed to sacrifice the last 5 minutes of each class so that students could complete my exit slips. Similarly, I could not demand the participation of students in check-ins and focus group sessions when their academic, extracurricular, or family obligations conflicted. Sometimes I had to schedule a focus group at a later date than I wanted or reconfigure the student groups because of the students’ schedule constraints. In particular, the focus groups during week one and week four were each conducted 13 days after the date of the first set of clips in the prompting video that was used for that focus group. While I tried to honor social groups when composing the groups to enhance students’
willingness to participate (Kitzinger, 1994), I was not always able to do this perfectly either because students’ schedules conflicted or, in at least two cases, students forgot the time and showed up to the other focus group instead.

Another practical limitation to this study is the unique role of the teacher given the setting. My unique access to this boarding school was an asset when it came to the richness of data I was able to collect, but it was also a limitation. The fact that, long before and long after the study, I would continue to see this teacher on a semi-regular basis meant that he may have been less frank in certain reflections than he may have been with a researcher with whom he would no longer have to relate after the study was over. Furthermore, the fact that the setting was a boarding school meant that there were interactions between the teacher and students that happened outside of the classroom, which I could not see. This limited the amount of data I was able to collect on how the teacher and students built relationships with each other.

The nature of naturalistic inquiry also limits the generalizability of the findings. Guba and Lincoln (1982) point out that the value of generalizability is rooted in a positivist epistemological standpoint. Naturalistic inquiry is rooted in the belief that context matters, and every context is different. The best that we can strive for is to develop enough thick description (Geertz, 1973) to improve transferability where it is appropriate. In this case, the setting of a boarding school—which made data collection easier—was also a limitation since this is a very unique educational context that reflects a minority of U.S. students’ experiences. Furthermore, the demographics of Mr. Green’s class may reflect some school communities in America but hardly the majority of them. Rather than maximizing transferability based on demographic representativeness, however, my goal was instead to offer some insights into the process of engagement and relationship building that could inform a better set of questions for educators to ask themselves.
when considering the ways that their actions and the environments that they help construct might contribute to the constructive flow of these processes in the future. I rely on my thick description in the findings section to empower readers to decide for themselves the extent to which my findings may apply to other situations.

Finally, the nature of this study also raised the challenge of subjectivity. As naturalistic researcher, I was the primary tool for both data collection and data analysis. On the one hand, if my perspective were untamed it would threaten to obfuscate the findings I hope to illuminate. On the other hand, however, Peshkin acknowledged that a researcher’s subjectivity cannot be removed “like a garment” (Peshkin, 1988, p. 17) and, in fact, can be constructive in helping clarify a researcher’s unique contribution. To that end, I acknowledge that a defining feature of my subjectivity in this research process has been my background as a secondary teacher. It instigated my question by driving me to wonder about how teachers’ actions influence students’ engagement. It infused the way I looked at the literature and articulated my analysis; I chose to focus on teacher moves, and I used language to describe moves occurring in the classroom in a way that made the most sense from my teacher’s perspective. I sought to honor the emic voice of the students involved in this process by privileging their perspectives in my data collection process. I also spent more of my data analysis process listening to their voices, but I articulated my findings through a language (drawn in part from the literature) that made sense of student voice from the perspective of a teacher. This study uses interpretive language of an educator who believes in her agency to affect student engagement. It was to educators that I sought to speak. It was to students that I sought to listen.
CHAPTER FOUR

FINDINGS

Introduction

In this chapter, I will present the findings of my study. The chapter is organized into five main sections. First, I begin with a section that explains how the teacher and students each described engagement. This is where I describe the patterns about what participants said when they commented on what student engagement looked like when it was happening. Second, I describe how the teacher and students each discussed the process of engagement. This is where I describe the patterns about what the participants said were the factors that helped and hindered student engagement in the classroom. These focus mostly on “teacher moves,” or the ways in which they perceived the teacher as influencing student engagement. Third, I describe patterns in the types of engagement-related factors that some students tended to comment on more than others. This is where I show evidence of inter-student diversity in how much students tended to comment on certain types of teacher moves more than others. Fourth, I describe types of events in which the teacher (on the one hand) and a number of students (on the other) indicated substantially different perceptions on the process of engagement that was happening in the classroom. This is where I present patterns in context and perceptions when there was disagreement between the teacher’s perceptions of his effects on student engagement and the students perceptions of the same events. Finally, the last section describes patterns in the quality of the teacher-student relationships that students reported in the final, one-on-one interviews.

The first, second, and fifth section help address my first research question. The third and fourth sections summarize findings that resulted from my analyses aimed at answering my second research question. Through the process of analysis, it became clear that temporal change
model reflected in my second research question did not adequately describe the patterns in the
data. Thus, the findings in the third and fourth sections reflect patterns about types of differences
in participants’ perceptions of the same events. My research questions are as follows:

1. What are teacher and student perspectives on the process of student engagement in
   learning in the classroom, and how is evidence of that process related to evidence of
   teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those
   changes related to the quality of teacher-student relationships in the classroom?

**Teacher and Student Perceptions of Engagement**

In the process of explaining the ways they perceived the process of student engagement
playing out (i.e., what influenced students to engage and when), the participants in this study also
shared perceptions on the nature of engagement itself (what the students did when they chose to
engage or disengage). First, I will present the patterns that arose from the teacher’s comments.
These patterns emerged from commentary on both the demonstrated student engagement he saw
and the ideal features and goals of student engagement toward which he wanted students to
strive. After presenting the teacher’s perceptions, I will share the students’ perceptions. In this
case, I will present patterns in the language students used to describe their experiences of
engagement or disengagement. I will also present findings on their perceptions of fellow
classmates’ levels of engagement.

**Teacher Perceptions**

Throughout the study, Mr. Green commented on how he saw students engaging in his
class. In addition to commenting directly on his observations, Mr. Green also chose to explain
some of his ideals for engaged student behavior. Below are descriptions of his perceptions about
what student engagement looks like. These analyses are based on his comments of both actual and ideal examples.

Throughout the term, Mr. Green indicated that he believed the class as a whole was mostly engaged.

We haven’t hit that critical mass problem of a couple of students who really drag the class down or kids who are just disconnected. I feel like everyone’s pretty engaged already, and I’ve already seen some good success stories coming out of it already when I look at their grades” (Mr. Green, personal interview, September 30, 2016); “I feel like this group is pretty engaged no matter what I do on the whole. I could probably just lecture to them, and they would stay on board with it. (Mr. Green, personal interview, November 18, 2016)

Mr. Green also indicated that he believed there were many ways students might engage, and so to judge a student’s engagement he used the quality of the work the student produced as an indicator: “not verbally expressing yourself doesn’t necessarily mean you’re not engaged, so I tend to look more at the output, the workflow for engagement. If I don’t see both, then I know there’s something [wrong with the student’s engagement]” (Mr. Green, personal interview, October, 27, 2016). Because Mr. Green’s perception of student work played a role in his perception of their engagement, I included his reflections on the quality of their work production in the descriptions student engagement.

When Mr. Green reflected on individual student engagement, he often chose to comment on students’ attentiveness, independence, collaboration, critical thinking, and ability to produce high quality work (see Table 4.1). These data came from the video-prompted weekly interviews and the question-prompted final interview.
Table 4.1

*Teacher’s Perceptions of Student Engagement*

<table>
<thead>
<tr>
<th>Category</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attentiveness</td>
<td>Student listens and pays attention to the teacher or task at hand.</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>Student is willing to problem solve, ask questions, evaluate the quality of ideas, and/or apply a “science mindset” to everyday problems and experiences.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Student helps peers; student negotiates norms for how to work on group projects and willingly works with others when teacher steps back.</td>
</tr>
<tr>
<td>Independence</td>
<td>Student takes problem-solving initiative; student consults resources other than the teacher when s/he has a question; student persists in the face of adversity; student demonstrates self-regulation and self-discipline to stay focused on science while in class.</td>
</tr>
<tr>
<td>Work Production</td>
<td>Student produces high quality work; student demonstrates high potential to pursue honors label; student cares about the presentation of his/her work to outside audiences; student persists in developing technology and lab writing skills needed for science.</td>
</tr>
</tbody>
</table>

**Attentiveness.** One way Mr. Green described student engagement was with language that described presence or absence of attention. Specifically, there were multiple times that he noted James as being attentive and Sophie as being inattentive.

I’m just scanning the room and it looks like most students are listening at least. James’s playing with something in his hands, but he’s right there in the front” (Mr. Green, personal interview, September, 30, 2016). “So I just noticed that there I’m talking and Sophie is just *(MR. G uses hand to mimic typing on a keyboard)* doing a couple of things on her computer. . . . I’m watching [Sophie] do a bunch of things, and she’s actually one of the ones who’s been confused. (Mr. Green, personal interview, October 7, 2016)

**Critical thinking.** Another way that Mr. Green commented on student engagement was to describe a willingness in students to engage in critical thinking. This could be demonstrated by a willingness to offer solutions to problems: “They’re generating it as a class, or in this case just
one guy, and he was ready to say the whole thing. . . . that’s James, who is just one of those kids who’s on top of it” (Mr. Green, personal interview, September 30, 2016). It could be demonstrated by a willingness to ask questions: “I was nervous early on that Cody and Collin would play off of each other and be the too cool for school guys, but no, they’re asking questions, they’re engaged, they’re up front” (Mr. Green, personal interview, September 30, 2016). Part of critical thinking is also an interest in ferreting out the best ideas.

[T]rying to get kids to be good claim makers, and claim scrutinizers, and asking for evidence, and, you know, my holy grail moment for the year would be them asking each other that without me being involved at all or introducing some of that language. (Mr. Green, personal interview, September 30, 2016)

Finally, critical thinking also includes the propensity to apply a science mindset to what the students see in everyday life.

So I’m hoping that they’ll. . . see a physical situation that they’ve seen before that they’re used to, some kind of everyday thing, and start to almost see the symbols in their mind and say, oh, we could measure that variable and that variable and see how they’re related. (Mr. Green, personal interview, November 11, 2016)

Collaboration. Collaboration encompasses students’ engaging in learning helping each other complete tasks and negotiating norms for how they interact and work together on class-related tasks. One reason Mr. Green indicated that he values this aspect of engagement is because it reflects ways in which students will need to engage in learning beyond his classroom.

There’s even more value in the randomization [as a means of assigning lab partners]—there’s the chance of life. And sometimes you’ll get two kids who are on the same page, but it’s really important to be able to work with somebody who gets it way better than
you or way worse than you and needing to find that middle ground…. later in life, you
don’t get to pick your co-workers, so you’re just going to have to learn to work with
people. (Mr. Green, personal interview, October 7, 2016)

Mr. Green noted engagement by highlighting students who appeared to be helping their peers.

I think sometimes because [Maggie] and Sophie are friends, she kind of has to bring
Sophie along and keep her on point or show her how to do things. But you know, that
was actually the kind of kid I was in high school. When I was taking physics, I got it a
little bit before some of the kids who were suffering the most; so not that I was the star of
the class, but I was the one willing to help people. So I actually have a soft spot in my
heart for those kinds of kids who learn by teaching others even if they don’t understand
everything fully. (Mr. Green, personal interview, December 16, 2016)

Ellen [is] engaging with the class material through Sarah, and I think they kind of figure
things out together so that kind of pair has worked out…. I think Ellen’s probably getting
there via Sarah, which is, ironically good for Sarah. (Mr. Green, personal interview,
December 16, 2016)

Twice over the course of the term, I observed Mr. Green asking students to collaborate as
an entire class to accomplish a project. When reflecting on these activities, he highlighted the
value of the moments where he was able to step back and the students interacted with each other
to decide what to do.

I saw them interacting with each other, and I wasn’t involved; and [they were] asking
questions of each other--how are we going to do this, or saying this really bothers me, but
then willing to do something about it. I feel like the class is engaging with each other.

(Mr. Green, personal interview, October 7, 2016)

I liked this. I gave it to them and they’re students, they’re not just standing and looking at each other. They’re bouncing [ideas] off [of each other]. I love having a student up at my keyboard typing stuff on the screen. I’m just kind of observing. (Mr. Green, personal interview, October 7, 2016)

In addition to celebrating when students took more control over the direction of class by working with each other, Mr. Green also lamented the moments in which the students did not choose to engage in this way.

I think there’s good food for thought, but it became them answering me and not continuing to interact with each other. And, you know, that’s tough for me. (Mr. Green, personal interview, October 7, 2016)

I’d really rather it be, you know, let’s do this all together. And maybe I’ll just be part of it; I don’t really want to be the leader, but unfortunately I think I was a little too much the leader in this one. (Mr. Green, personal interview, November 18, 2016)

**Independence.** Mr. Green indicated that he believed a sign of engagement was when students approached class material and/or tasks independently without leaning on him for help. Independence refers to the quality of trying to solve class-related problems by taking personal initiative and persisting in the face of adversity. It includes approaching science-related tasks with problem-solving initiative: “I’m trying to get them to the place of, here’s an idea, go explore it, come report back what you find” (Mr. Green, personal interview, November 11, 2016). Mr. Green often used the language of viewing himself as a coach in conjunction with this sort of independent student behavior.
I’d like to back off their methods of understanding and be more like a coach. Like, you know, help prompt them in the way that they should go. . . . [T]he skill I’m really trying to teach them is use the tools at your disposal, use stuff that I’ve written ahead of time, in the past; use your old labs; use the internet; use, you know, whatever you can find to answer the questions yourself. . . . I want my role as font of all knowledge to decrease through the year to the point where I can just set things up, give some background info, and then have at it. (Mr. Green, personal interview, November 18, 2016)

Independence also includes demonstrating perseverance when faced with a challenge. My goal for [the students] is to work through it, you know, I divide this thing by this thing and then I multiply it by this thing, oh no that didn’t work, alright I’ll guess I’ll switch these things. You know, that process of—and they’re doing it in Mathematica, so they can program it a little differently and hit shift enter and run it again and again and again until they get it. That takes a little bit of tenacity and grit. So that’s my ultimate goal. (Mr. Green, personal interview, September 30, 2016)

I could lean over and do that work for them, but struggling against it means that later on when we need to use it all year—you know, for the next couple of terms we’re going to be using video; they’re going to need to know how to get it to their computers, and you know, they would be willing to just let me go ahead and fix it for them, to the point of calling me over and saying, alright Mr. G, I cant do this, can you fix it? Like, no, I want you to learn how to do it. (Mr. Green, personal interview, November 18, 2016)

Independence also includes practicing self-regulation and self-discipline to stay focused on science related tasks while in class. When Mr. Green expressed uncertainty over whether or
not a student was engaged, he often commented on the value of students figuring out for themselves when and how to pay attention or participate in ways that work best for them.

I see Sophie kind of gazing out the window. . . but I think part of a skill of being a student is to be able to kind of process it in your own way. So I’m okay with it. (Mr. Green, personal interview, September 30, 2016)

I just noticed that there I’m talking and Sophie is just doing a couple of things on her computer. I was ready for that, I was watching. . . . And you know, to some extent, I want kids to make those decisions. Eventually they’re going to go to a college where they can have their laptop open in a lecture hall, and they can do whatever they want. So, knowing how and when to pay attention is a pretty good skill to know. (Mr. Green, personal interview, October 7, 2016)

When describing this ideal he often commented on which students he saw as embodying this ideal already and which students were on the way but still had room to grow. Jason and Zach were consistently two students who Mr. Green perceived as willing and able to comprehend the material on their own already. To a lesser extent, he spoke of James, Sarah, and Eric in this way, too:

I think James is a kid, and Zach is a kid, who they’re just kind of getting it themselves. . . . I think James can really do it on his own. . . [and] Jason is getting this on his own big time [too]. (Mr. Green, personal interview, September 30, 2016)

I would say, you know, the quieter folks, Jason, and Sarah, and Zach, and Eric, are just getting it and going full guns. They’re on it. . . . I haven’t had to give any of them extra help. I can’t even imagine having to give any of those folks extra help. (Mr. Green, personal interview, November 18, 2016)
In terms of students who seemed to be approaching the independence ideal in their engagement, Mr. Green described students who would want to ask Mr. Green for help but did not need “hand-holding” per se:

I feel like that group of kind of Megan, Collin, and Todd, there’s a bit more of that sharing [their questions and concerns with me], and I would kind of want to see them form a group that helps each other in some way. (Mr. Green, personal interview, September 30, 2016)

“James and Todd, Collin. . . are ones that are still asking [me questions] at different times” (Mr. Green, personal interview, November 18, 2016).

Finally, Mr. Green indicated that he noticed signs of unwillingness to persist independently as indicative of less than ideal student engagement. “I think Cody and Sophie needed some more of that hand-holding” (Mr. Green, personal interview, September 30, 2016). “[W]ith Maggie, I definitely think she could get it, and a lot of times they’re just looking for those pats on the shoulder along the way” (Mr. Green, personal interview, October 14, 2016).

[I said to the students] I want you to wrestle with it; I want you to struggle with it. And I saw Cody kind of go, ugh (MR. G puts his hand over his eyes and rubs his forehead mimicking Cody’s frustration) and then just immediately lean over to Todd, basically like, well, what’s the answer? Um, so really kind of unwilling to struggle with it. (Mr. Green, personal interview, November 18, 2016)

**Work production.** As mentioned above, Mr. Green indicated that he believed the quality of students’ work production was one indicator of the quality of their engagement. One way Mr. Green indicated his beliefs about high quality work output was by highlighting students he believed should pursue the honors tag for his class. To obtain honors certification for the class,
students had to create an online portfolio of their work from the class with additional reflections and connections to physics beyond the classroom. Early on, he noted Jason and Zach as two students he thought should do the honors portfolios (Mr. Green, personal interview, October 7, 2016), but later by the end of the term, he expanded his scope to include a few more students.

    Jason certainly has it—I guess they all have that potential, and what I’d love to do is kindle that passion if it’s there but not try to force the issue. . . . Deep down, I’d love to see Sarah do one, I’d love to see James do one, I’d love to see maybe Zach and Eric do one. (Mr. Green, personal interview, December 16, 2016)

Jason was also the student who Mr. Green mentioned repeatedly as the student whom he believed was producing the highest quality work. In the end, the only students who completed the honors work were Jason and Zach.

    One way Mr. Green described high quality work production was by referencing the value of appearance in the presentation of student work. Ultimately, Mr. Green indicated that he wants students to consider the audience and bigger purpose of each task he assigns and make choices about how they complete their work that take these things into consideration. Part of this seems to be rooted in Mr. Green’s self-reported value for visible learning. “Any kind of project should be a real visible learning experience, that their understanding is now visible” (Mr. Green, personal interview, November 18, 2016).

    For the most part, Mr. Green was generally disappointed by how the students were not willing or able to engage with this goal in mind. It also became clear that the dearth of student engagement with a value for appearance led Mr. Green to wrestle with undermining his other goal of promoting independent and collaborative student engagement.
If anything I probably derailed the engagement with each other a little bit by getting so involved, but I felt like I wanted to because I wanted to change the shape of where they were going. . . . I wanted it to be meaningful for people viewing it. So, I guess I added constraints. (Mr. Green, personal interview, October 7, 2016)

“[T]hese kids really do need some training in how to do a good presentation because I’ve seen so many bad ones, and I don’t want to be a teacher that even lets that propagate forward” (Mr. Green, personal interview, November 18, 2016).

Another way that Mr. Green commented on high quality work production was to highlight students’ improving their skills at writing lab reports and using digital tools in the process of doing science work.

[W]e’re at kind of a critical moment where I think kids will get really turned off to Mathematica, they’ll see it as really hard and they won’t want to use it because of what I’m trying to get them to do with it. And, both are goals. I want them to get the content of converting, and I want them to get the skill of using it correctly. (Mr. Green, personal interview, September 30, 2016)

**Student Perceptions**

Unlike Mr. Green, when the students commented on the nature of engagement, they tended to describe their own experiences rather than elaborating on ideals. The language they used often emphasized attention rather than action as the key component of engagement. Once in awhile, students would also comment on the engagement of one of their peers who was not present in the focus group. In these cases, students tended to comment on their peer’s collaboration, ability, and work production. Most of the time, however, students reflected only on their own levels of engagement or disengagement. Overall, the students’ exit slips indicated
that they were more engaged than not. Figure 4.1 shows an approximate gauge of students’ engagement in class each day. I constructed this figure by adding up the number of engaged moments the students indicated on their exit slips and then subtracting the number of disengaged moments they indicated. This reveals that 18 out of the 19 days that I collected exit slips in the fall term, students indicated that there were more engaging moments than disengaging moments that stood out to them.

![Student-Reported Engagement Levels](image)

**Figure 4.1.** Summary of student-reported moments of high engagement (positive) vs. low disengagement (negative) during each class of the fall term in Mr. Green’s class.

**Engagement.** When students described being engaged, they frequently used language about “tuning in” or “waking up.” Other variations included comments like, “in the other videos from last week, I literally spaced out sometimes, but in this one all of us looked like into it” (Todd, focus group interview, October 6, 2016); “I feel like we all just kind of clicked back in for a second because we knew what he was talking about” (Megan, focus group interview, November 17, 2016). These euphemisms seem to parallel the more direct language that some
students used to describe their engagement as attention-oriented: “I was actually paying attention. . . I was actually listening” (Sarah, focus group interview, October 27, 2016). Sometimes students also indicated feelings of fun or enjoyment when describing their engagement: “I like it a lot when Mr. G shows us videos in class. . . I feel like it’s kind of like where people become more engaged” (James, focus group interview, September 29, 2016).

**Disengagement.** When students described being disengaged, they frequently used phrases like “out of it,” “zoned out,” “spaced out,” or “checked out.” For example, “to be honest, it looked like I checked out” (Cody, focus group interview, September 30, 2016); “Some [of us] didn’t really, I guess, tune in on what Mr. Green or any other person was saying” (Ellen, focus group interview, October 6, 2016). “I felt like so disengaged and I was so bored, and I checked out basically” (Sarah, focus group interview, October 27, 2016). Some students also communicated an experience of negative emotions as co-occurring with their disengagement: “I hate when he does that. . . That’s when I get the most disengaged, honestly” (James, focus group interview, October 13, 2016). “I think I was at that point where I was annoyed and just checked out” (Sophie, focus group interview, November 17, 2016).

Sometimes students re-enacted body posture as a way of explaining their disengagement. For example, Maggie indicated her lack of engagement one day by saying, “I was just like this (Maggie rests head on left hand, left elbow on table, and slouches in seat)” (Maggie, focus group interview, October 6, 2016). Eric also used body language to communicate his disengagement, “I think I was just like this (rests chin in hand on desk) the whole time, so I think I was just kind of zoning out” (Eric, focus group interview, October 13, 2016).
Another way that students indicated their disengagement was to report that they had no memory of a video clip from class. In a conversation from the Week 4 focus group, the students agreed that this was a shared experience:

Megan: See I kind of remember him drawing the scatterplot, but I don’t remember anything else he said.

Maggie: (*chuckling*) I don’t even remember that.

Sophie: I literally don’t remember the clip.

Jason: I don’t remember that either... Yeah, I was completely zoned out (focus group interview, October 30, 2016).

Sometimes students referenced their lack of cognitive effort as an indication of disengagement. Often this took the form of describing themselves as not paying attention or almost falling asleep. One comment from James highlighted the boundary between partial and full engagement:

Like I’m not completely checked out; I’m still doing what he’s asking me to do, and I’m paying attention in class, but I feel like I’m not fully committed to class yet... I’m not really putting my best effort into class right now because I’m not engaged in the material at the moment. (James, focus group interview, October 27, 2016)

**Students’ perceptions of peers’ engagement.** The students did not speak a lot about their peers’ engagement or abilities, but when they did, they tended to comment on the helpfulness and abilities of their peers. Maggie made a couple of references to how helpful Eric was as a partner (Maggie, focus group interview, October 6 & October 13, 2016). James made a reference to how unhelpful Cody was as a partner (James, focus group interview, November 3, 2016). Zach also indicated on one occasion that Ellen was an unhelpful partner (Zach, focus
group interview, November 3, 2016). However, the one student who classmates repeatedly indicated they believed was the most focused, talented, productive, and helpful student was James. “Yeah, also, I have James in my dorm and he knows how to do everything we’re doing” (Todd, focus group interview, September 30, 2016); “like during a normal lab. . . . if I have a question, I’ll just go ask James” (Sarah, focus group interview, October 6, 2016).

I just remember that the next class, I was still on step five or six which was where he said to be and James was like finished, and he put James’s on the board, and I had no idea, and then I realized I had done mine wrong. . . . He’s like really smart. (Maggie, focus group interview, September 30, 2016)

**Summary of Teacher and Student Perceptions of Engagement**

Key findings include: the teacher tended to emphasize more active elements of engagement when describing student engagement. These include attentiveness, critical thinking, collaboration, independence, and work production. Students tended to highlight attention-oriented aspects of engagement when they described their own engagement. When discussing their peers, they tended to focus on helpfulness and demonstrated ability, and James was the most referenced student in terms of both.

**Teacher and Student Perceptions of What Makes Engagement Happen**

In addition to expressing beliefs about what student engagement looks like, the teacher and students also commented on the factors that facilitated and inhibited student engagement. The study was focused on the teacher as a significant social-contextual actor who influenced student engagement, and most but not all of the comments related to the effects of his behaviors. I will refer to these engagement-related behaviors as “teacher moves.” Below are descriptions of the particular moves that the teacher enacted in the classroom that either students or the teacher
(or both) indicated were salient and influential to student engagement. These moves are organized into six categories (see Table 4.2).

Table 4.2

Categories of Teacher Moves That Address Basic Psychological Needs

<table>
<thead>
<tr>
<th>Basic Psychological Need</th>
<th>Engagement-facilitative Move</th>
<th>Engagement-inhibitive Move</th>
</tr>
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<tbody>
<tr>
<td>Autonomy</td>
<td>Autonomy-support</td>
<td>Control</td>
</tr>
<tr>
<td>Competence</td>
<td>Structure</td>
<td>Chaos/Understimulation</td>
</tr>
<tr>
<td>Relatedness</td>
<td>Involvement</td>
<td>Alienation</td>
</tr>
</tbody>
</table>

For each basic psychological need indicated in self-determination theory (Connell & Wellborn, 1991; Deci & Ryan, 1985), there are two categories of teacher moves, one to indicate moves that supported the fulfillment of that psychological need and another to indicate moves that undermined the fulfillment of that psychological need (Connell & Wellborn, 1991; Skinner et al., 2008). The need for autonomy is facilitated by autonomy support moves and inhibited by control moves. The need for competence is facilitated by structure moves and inhibited by chaos/understimulation moves. The need for relatedness is facilitated by involvement moves and inhibited by alienation moves. Table 4.3 summarizes the subcategories of specific moves within each broader category of teacher moves. Following the explanation of these subcategories, I will also briefly describe other contextual factors beyond the teacher moves that participants indicated were influential to student engagement.

Table 4.3

Subcategories of Teacher Moves That Facilitate or Inhibit Student Engagement.

<table>
<thead>
<tr>
<th>Main Category</th>
<th>Subcategory</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>Providing options</td>
<td>Teacher offers students different ways of accomplishing a task in class.</td>
</tr>
<tr>
<td>Control Moves</td>
<td></td>
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<tr>
<td>---------------------------------------</td>
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<tr>
<td>Allowing student control</td>
<td>Teacher allows students to figure out their own way to accomplish a task; teacher allows students to pursue an approach to work that the teacher had not predicted or delineated.</td>
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<tr>
<td>Adaptting</td>
<td>Teacher compromises or changes his plans in response to immediate student feedback.</td>
<td></td>
</tr>
<tr>
<td>Creating relevance</td>
<td>Teacher designs an activity so that it feels purposeful, meaningful, interesting, and/or fun to the students.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Moves</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking too much</td>
<td>Teacher talks more than students need; teacher neglects opportunities to elicit student responses.</td>
</tr>
<tr>
<td>Rescinding freedom</td>
<td>Teacher imposes structure in a way that halts a student’s attempt to create his/her own structure.</td>
</tr>
<tr>
<td>Overcomplicating</td>
<td>Teacher makes the process of how class activities work more laborious or painstaking than necessary; teacher sets up class activities in ways that are different from what students prefer without a clear, necessary reason for doing them differently.</td>
</tr>
<tr>
<td>Failing to create relevancy</td>
<td>Teacher presents material or class activities in ways that feel boring or irrelevant to students.</td>
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<tr>
<th>Structure Moves</th>
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<tbody>
<tr>
<td>Creating challenges</td>
<td>Teacher constructs tasks for students that feel doable but not too easy.</td>
</tr>
<tr>
<td>Providing guidance</td>
<td>Teacher offers instructions and resources that empower students to know what do next or how to approach class material comprehensibly.</td>
</tr>
<tr>
<td>Offering feedback</td>
<td>Teacher responds to student work or questions with additional guidance, clarification, or evaluation.</td>
</tr>
<tr>
<td>Reducing pressure</td>
<td>Teacher allows students to re-do work when they make mistakes without significant penalty.</td>
</tr>
<tr>
<td>Eliciting responsiveness</td>
<td>Teacher asks students to respond orally or move around and do an activity hands-on.</td>
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<table>
<thead>
<tr>
<th>Chaos/Understimulation Moves</th>
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</thead>
<tbody>
<tr>
<td>Confusing instructions</td>
<td>Teacher is unclear with his directions.</td>
</tr>
<tr>
<td>Movement</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
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</tr>
<tr>
<td>Creating too much challenge</td>
<td>Teacher asks students to do something that they feel was outside of their comfort or ability zone.</td>
</tr>
<tr>
<td>Failing to provide clarity</td>
<td>Teacher did not provide enough guidance for the student to feel capable of taking the next steps.</td>
</tr>
<tr>
<td>Repeating instructions</td>
<td>Teacher continues to explain a concept or instructions even after students knew what to do next.</td>
</tr>
<tr>
<td>Failing to challenge</td>
<td>Teacher makes an activity too easy or reduces the pressure to take action.</td>
</tr>
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</table>

**Involvement Moves**

<table>
<thead>
<tr>
<th>Movement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathizing</td>
<td>Teacher takes a student’s feelings into consideration when making a decision; teacher hears and acknowledges the student’s feelings of frustration; teacher acknowledges and affirms a student’s effort in the face of adversity or positive intent in the face of confusion.</td>
</tr>
<tr>
<td>Connecting</td>
<td>Teacher endears himself to a student, often through humor.</td>
</tr>
<tr>
<td>Expressing confidence</td>
<td>Teacher celebrates a student’s efforts and/or demonstrates faith in a student’s ability to work through a challenge.</td>
</tr>
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</table>

**Alienation Moves**

<table>
<thead>
<tr>
<th>Movement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failing to attune</td>
<td>Teacher ignores a student’s feelings, needs, or intentions; teacher fails to take the time to explore a student’s circumstances; teacher assumes student silence is a sign of comprehension and/or assent; teacher moves on without listening to student feedback; teacher ignores tensions, embarrassment, or negative feelings of students.</td>
</tr>
<tr>
<td>Rejecting</td>
<td>Teacher refuses to oblige a student’s request or honor a student’s efforts; teacher sends mixed messages about his willingness to help students; teacher dismisses student work or suggestions without explanation.</td>
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</table>

**Autonomy-Support Moves**

These teacher moves include any actions of the teacher that students or teacher perceive as facilitating engagement by supporting the psychological need for autonomy. These moves
include when the teacher supports autonomy by empowering a sense of agency for students. These moves are present when students report feeling that the teacher is trying to incorporate their voices, choices, preferences, interests, and values into the classroom experiences. The specific ways in which Mr. Green and his students described his moves that supported autonomy were by providing options, allowing student control, adapting, and creating relevance.

Providing options. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to offer students different ways of accomplishing a task in class. These options can be explicit:

So my thought here is that I’ve got to do a little differentiation. There are kids that pick up on this skill quickly, or have even already seen it before, and for those kids I really want to give them an opportunity to try something else out. (Mr. Green, personal interview, September 30, 2016)

“I like that he doesn’t make us take notes, because I had to put my full attention into what he’s saying instead of trying to cram everything down on my computer” (James, focus group interview, November 10, 2016). Options can also be provided more implicitly:

[When we work on our labs independently during class] I feel like Mr. G is there to help us. So it’s like, if we’re not getting it, if we’re not picking it up on our own, he’s still there to teach it to us. It’s like an option if you want to be lectured or not. (Jason, focus group interview, October 13, 2016)

Allowing student control. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to allow students to figure out their own way to accomplish a task. This is
slightly different from providing options because there are no overt choices. These teacher moves occurred when students took initiative in ways that the teacher had not predicted or delineated, and the teacher allowed it.

I think it was good [that Mr. Green] kind of let us figure it out ourselves” (Megan, focus group interview, October 6, 2016); “it was kind of more like, you tell me, not like I give you a problem and then you [do what I say]. (Todd, focus group interview, November 10, 2016)

Sometimes allowing student control was less about student initiative and more about the teacher allowing students to experience natural consequences rather than teacher-imposed corrections to their behavior.

[A]s the year goes on, I’m even more hands off and just like, you guys this is your time. Knowing full well, almost intentionally, that there will be kids who squander the time and don’t use it well and are in crisis more, and then the lab is going to be due, so they had to come back during office hours or during their own time and do it. (Mr. Green, personal interview, October 7, 2016)

“I guess at the moment I’m letting the extroverts talk through everything out there and letting the introverts listen in as they prefer to do I think” (Mr. Green, personal interview, November 3, 2016).

Allowing student control moves also happened when the teacher encouraged a student to take the initiative by restraining himself from providing more delineated or clear options. Mr. Green often described these as moves toward student-centeredness.

I think if I was teaching it straight ahead some old-school way, if I wasn’t thinking about student engagement, and student centered learning, I’d just be putting equations on the
board saying, okay let’s run solve on them, that kind of thing. But I think there’s such value in them owning the numbers, getting out there, beginning to work as partners. . . . I think it’s so much better for them, even though it takes longer, for them to own it and apply their own numbers and sometimes make the mistake, have to go back out, and there’s time for that. Really just trying to shoot for that student centeredness. (Mr. Green, personal interview, October 7, 2016)

Students often expressed this type of move with language of being allowed to do it on their own:

He’s there if you need help, but otherwise you sort of do stuff on your own and learn it on your own. . . . I think it’s a lot more engaging for me because it’s not sort of just sitting there and listening to him just try to give you information; you’re really doing it yourself and learning it yourself. (Jason, focus group interview, October 13, 2016)

**Adapting.** This subcategory refers to moments in which the teacher or a student indicated that he or she believed that a student’s engagement had been positively affected by the teacher’s choice to compromise or change his plans in response to immediate student feedback.

I think he knew that none of us were really engaged, so I think changing to the Ed Puzzle—because then we actually have to look to see if we got the answers right. So I think he also knew that we weren’t really in it, so he kind of had to do that I guess.

(Maggie, focus group interview, September 30, 2016)

**Creating relevance.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to design an activity so that it felt purposeful, meaningful, interesting, or fun to the students. Sometimes this came in the form of using student-generated work to model a point the teacher wanted to make: “I could have made up a problem myself or whatever, but I
like the fact that I pulled from a student with a specific problem. Let’s get everyone to try it and see what that result was” (Mr. Green, personal interview, September 30, 2016); “I like the technique he has, he has someone volunteer to put theirs up, and he can show you how to fix it. I like that” (Sarah, focus group interview, October 27, 2016).

Many times, creating relevance moves came in the form of the teacher sharing videos or demonstrations that connected the topic they were studying to the real world:

I like it a lot when Mr. G shows us videos in class, because. . . I feel like it’s kind of like where people become more engaged I guess, because it’s actually interesting stuff you want to know. (James, focus group interview, September 29, 2016)

To stay focused on one thing all the way through—it is work and so it feels like work, and I think a sense of fun in a traditionally difficult subject like physics—if I can keep that going throughout the year by showing them—I mean, it’s a little bit gimmicky, it’s a little bit of showmanship, but I mean, it’s also kind of cool. . . . There are a few lessons where it’s hard to slip something in, but you know, either a hands-on thing or a funny video. (Mr. Green, personal interview, October 27, 2016)

Another way that the teacher created relevance was to offer activities through which students felt that they were able to see a purpose or real-life application of the science concepts they were studying: “I liked it. I was into it. It was sort of like real life application of things we were learning” (Jason, focus group interview, October 13, 2016); “[I]t was a little engaging because it was interesting. . . . I just think that it made me think of some sort of purpose for our class” (Eric, focus group interview, October 27, 2016).

By providing competitive games in class, the teacher facilitated engagement in a variety of ways, as I will continue to discuss in structure moves. One way that students indicated that
these games helped facilitate their engagement was because they helped the teacher create relevance by being fun. “[Playing a game through the online Kahoot website was] fun because you’re competing against everyone else in the class. So I like that” (Sarah, focus group interview, November 3, 2016). The students in one of the Week 5 focus groups all agreed:

    Todd: I felt like [Kahoot] kind of woke us up because we were all tired, like, oh we’re back at school. And that was like a fun thing to do to start off the class.
    Ellen: . . . [I]t was some sort of game that everyone seemed to know and like.
    Megan: It’s better than just talking about it. (Ellen nods) It keeps us engaged in what we want to learn about (focus group interview, November 3, 2016).

Control Moves

These teacher moves include any actions of the teacher that students or teacher perceive as inhibiting engagement by undermining the need for autonomy. In controlling moves the teacher directed student behavior and attention in ways that seem irrelevant or disconnected from students’ lives. When students report feeling like they had no choice, could not see the point of what they were doing, or felt the work they were asked to do was unnecessary, then students are experiencing their teacher’s moves as controlling. The specific ways in which Mr. Green and his students described his control moves were by talking too much, rescinding freedom, overcomplicating, and failing to create relevancy.

Talking too much. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to talk more than students needed or neglect opportunities to elicit student response. “Yeah, it’s just a lot of me talking. So there’s not a lot of back and forth engagement” (Mr. Green, personal interview, September 30, 2016). “Since like after his first talk session, I
guess—I don’t know how else to word it—but, um, he kind of told us what to do and then he kept on talking, so . . . I’m like, I know what to do, so I just want to do it now” (Todd, focus group interview, October 6, 2016).

Sometimes, Mr. Green references an interest in being efficient so that students can get to the hands-on work as co-occurring with his choice to talk too much.

I’m struck that it’s a lot of me talking. I could probably spin this—I’m trying to be efficient with the period, but I could also be asking, Jason, what’s one of the measurements we need? Sophie, what’s one of the measurements we need to get? And sometimes I do that. I especially do that in the classroom. I think here, I was just feeling the time crunch because I knew these kids would be missing a class. But, I don’t know, not as good for engagement. Everyone’s just passively listening. (Mr. Green, personal interview, October 7, 2016)

**Rescinding freedom.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to impose structure in a way that halted students’ attempts to create their own structure:

If anything I probably derailed the engagement with each other a little bit by getting so involved, but I felt like I wanted to because I wanted to change the shape of where they were going. . . . I wanted it to be meaningful for people viewing it. So, I guess I added constraints. (Mr. Green, personal interview, October 7, 2016)

I think that they were acknowledging that I was controlling too much. I was being too controlling of what it should be. And maybe even silently asking me to just let them do
their thing even if it wasn’t what I was looking for. (Mr. Green, personal interview, November 18, 2016)

Students also noted this type of move: “[H]e was just sort of telling us what we’re going to do…. I mean, we’re kind of choosing, but . . . he’s just [like], oh, we’re going to do this” (Eric, focus group interview, November 10, 2016).

**Overcomplicating.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to make the process of how class activities worked more laborious or painstaking than necessary.

I was telling you how teachers can sometimes try to make things too fun and then it’s boring. I think when he had us hang up our objects, and we went through all of that. I thought that was just a little too far trying to make it hands on. (Zach, focus group interview, September 29, 2016)

I don’t get why we had to stand up and walk to the back of the class, because the picture was pretty big and, like, he told us all to get up and go to the art gallery, but we walked like two feet, but I don’t think it was really necessary to get up. (Sarah, focus group interview, October 6, 2016)

I kind of felt like this whole shark tank thing was—it got across what he was trying to say, but he could have just told us straight out, length affects it the most, the other three aren’t as important. (Zach, focus group interview, November 3, 2016)

Sometimes overcomplicating moves referred to ways that the teacher choose to set up class activities in ways that were different from what students preferred without a clear, necessary reason for doing them differently.
I’d sort of prefer worksheets over Mathematica because it feels like I can apply more of what I’m learning to class than just using Mathematica since, I don’t know. I’m more used to using worksheets than like computers so I think that would help me a lot. (Ellen, focus group interview, September 29, 2016)

**Failing to create relevancy.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to present material or class activities that felt boring or irrelevant to students. One way that students articulated this move was to contrast their experience with a desire to learn “real” science: “I feel like we’re still in an introduction to the class. Like he’s just trying to get us used to it and we haven’t even started our first unit of actually learning something” (Zach, focus group interview, September 29, 2016). Another conversation in a Week 7 focus group captured this idea as well:

Maggie: I didn’t understand how it related to physics.

Sophie: mhmm, at all….

Ellen: I sort of agree with them. It sort of feels like we’re not learning anything, for some reason (focus group interview, November 17, 2016).

Another way students expressed this move was to simply say they were not interested in the material.

If you just think about how he approached it—um, I don’t know; we were doing something on the board and no one really got that, and then he was like, speaking of, let me just show you something really sarcastic; I think you guys will like it, but it just had no relevance really. (Maggie, focus group interview, October 13, 2016)
I kind of feel more excited for later in the year than right now, because... I feel like I’m not fully committed to class yet... I’m not really putting my best effort into class right now because I’m not engaged in the material at the moment. (James, focus group interview, October 27, 2016)

In general, I thought working on our slides was a bit boring, I guess. And the reason I wasn’t really sticking to it was—I don’t know—I think it was because I didn’t really see the point of like doing this in general. (Ellen, focus group interview, November 17, 2016)

Structure Moves

These teacher moves include any actions of the teacher that students or teacher perceive as facilitating engagement by supporting the need for competence. Through these types of moves the teacher helps craft doable challenges for the students. Not only do students feel capable of accomplishing a classroom goal, but they feel like they understand how to take the next steps along the way toward goals as well. Students have their interest piqued because there is something to do, and they know how to start doing it. The specific ways in which Mr. Green and his students described his structure moves were by creating challenges, providing guidance, offering feedback, reducing pressure, and eliciting responsiveness.

Creating challenges. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to construct tasks for students that felt doable but not too easy. “I like that Mr. G likes to challenge us a lot and he likes to help us make us do things on our own” (James, focus group interview, September 29, 2016).

I thought that [this lab] was definitely the best one because it was the biggest in that we had the most measurements. But I also thought it was the most complex because it was
kind of hard. . . . It was just the most satisfactory when we finished it because it was a big project and we just got it done. (Eric, focus group interview, October 13, 2016)

Sometimes students indicated that competitive games facilitated their engagement due to the fact that they felt like the game presented a challenge they could accomplish. “I feel like that’s what makes it engaging to me because it’s just a way to test your knowledge but in a competitive way. So it makes everyone want to be like the best person in the class” (James, focus group interview, November 13, 2016); “It kind of like forces you to really think about the questions so that you can be first and then like, if you do get it right, you have this sense of like, aw, yeah! It’s so gratifying… it’s like, I’m so good at this” (Sophie, focus group interview, November 9, 2016).

**Providing guidance.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to offer instructions and resources that empowered students to know what do next or how to approach class material comprehensibly. “I feel like Mr. G knows how to teach a class and he knows what students most commonly get caught up on. So I feel like he does a better job of explaining it more” (James, focus group interview, October 13, 2016).

I think it’s helpful for students if they see and hear my mental process as I grade it. So if they get to see behind the curtain and see, oh if this is how I’m going to get graded. It’s kind of like explaining the rubric. Or not just explaining but demonstrating the rubric in action. (Mr. Green, personal interview, November 3, 2016)

Sometimes Mr. Green offered guidance by providing helpful resources or processes. “I feel like I like Ed Puzzle because you can go back and see, like it’s easier for you to find videos and daily lessons because it’s right there. It’s always going to be there so you can go back”
I don’t think any of us would have chosen our partners, which is, I think, a good idea. . . if we had gotten to choose someone, I probably would have chosen someone that I wouldn’t have worked as well with. (Maggie, focus group interview, October 6, 2016)

**Offering feedback.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to respond to student work or questions with additional guidance, clarification, or evaluation. “I guess I kind of did tell them some things. You know, I don’t want to be the totally hands off kind of teacher, especially with new freshmen learning this new technique” (Mr. Green, personal interview, October 14, 2016).

I think that [Mr. Green] does a really good job of—I think he’s kind of trained his eye to see the syntax errors in Mathematica. But also, if you have something like, oh I got a 30% error on this thing, then he’ll be like—like he’ll kind of say it like it’s to you, but he’ll say it loud enough for everyone to hear it. (Eric, focus group interview, October 13, 2016)

**Reducing pressure.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to allow students to re-do work when they make mistakes without significant penalty.

There’s still a little bit of pressure because they know their answers are going to be up on the screen, but they can watch [the homework video] as many times as they need to, and
they know what the questions are going to be. They’re right there in front of them. (Mr. Green, personal interview, October 14, 2016)

I never want it to be a situation where people feel bad about how they are doing and are kicking themselves. I always want to keep it fun and not like worth anything real. . . I think they felt it, too, like there were no real stakes here at all, and so it’s not intimidating. (Mr. Green, personal interview, November 3, 2016)

**Eliciting responsiveness.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to ask students to respond orally or move around and do an activity hands-on:

We also do a lot of labs, and it’s not just sitting down in class every day which is usually when I’m most disengaged….It’s hands on, and it’s getting up and doing something and applying your knowledge. (Jason, focus group interview, October 13, 2016)

I think like just the fact that we were constantly doing something—even though what we were doing was like kind of boring and repetitive, just like holding [the pendulum weight] up, watching it go or whatever, I think that the fact that we were constantly measuring, adjusting the length, all that sort of stuff and marking down the data, just kind of made it a little more engaging so I was focused. (Eric, focus group interview, November 10, 2016)

Sometimes Mr. Green elicited responsiveness by asking students to respond orally.

[T]hen I’ll hear something—like a question or something like that, like being asked to the whole class, and then I just kind of wake up. . . [which] kind of makes it that little bit
more interactive by asking a question to the class. (Eric, focus group interview, October 17, 2016)

Sometimes, rather than ask students to respond orally, Mr. Green simply asked students to do work that he could see visually. “I guess I could ask them questions about what I just said, but here, I’ll pretty clearly see if they set it up or not” (Mr. Green, personal interview, October 27, 2016). A student conversation from a Week 4 focus group also captures this idea:

Sarah: I think with that we were at least doing something at the same time as he was talking so I was actually paying attention.

Zach: Yeah.

Sarah: because we had to set it up, so I had to do that so I wouldn’t fall behind, so I was actually listening.

Eric: Yeah, I think it was the same thing for me.

James: Yeah, basically, I feel like what Sarah was trying to say was that with some of the other lectures, there’s room to check out because even if you check out, you’re still like in pace with the class structure I guess, but like if you check out during a time like this, then you’re going to be behind on it and you’re going to have to make it up later (focus group interview, October 27, 2016).

Another way Mr. Green eliciting responsiveness was by providing competitive games. “He should do more Kahoots because it’s actually engaging. You’re actually doing something” (Sarah, focus group interview, November 3, 2016).

I feel like [Kahoot] would be the only thing that would actually engage me at that time… ‘cause it was something interactive. It was a competition. It wasn’t just him speaking to
us. I probably would have actually fallen asleep if he hadn’t done that. (Jason, focus group interview, November 3, 2016)

Chaos/Understimulation Moves

These teacher moves include any actions of the teacher that students or teacher perceive as inhibiting engagement by undermining the need for competence. These moves include two different types (chaos and understimulation) but they are linked because they both detract from students’ experiencing a state of optimal challenge. Chaos moves include any teacher actions that make students feel confused, overwhelmed, or uncertain as to how they can take the next steps. Simply stated, the task and/or its presentation feel too challenging. Understimulation moves include teacher actions that make students feel a dearth of challenge or pressure to act. Simply stated, the task and/or its presentation feel too easy. The specific ways in which Mr. Green and his students described his chaos/understimulation moves were by confusing instructions, creating too much challenge, failing to provide clarity, repeating instructions, and failing to challenge.

Confusing instructions. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to be unclear with his directions.

[H]e wasn’t very clear with his directions, so I’d rather be sitting in a chair and listening where I know I’m doing what I’m supposed to than walking around where I don’t necessarily know what I’m supposed to be doing. (Zach, focus group interview, September 29, 2016)

[T]hat mini lab was not mini, first off, at all; it was a normal sized lab; and then he connected it this bigger lab which is really confusing, and I have no idea what’s going on,
and it didn’t help today when I asked him how to do it, and he didn’t explain it very well.

(Sarah, focus group interview, November 9, 2016)

**Creating too much challenge.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to ask students to do something that they feel was outside of their comfort or ability zone.

I definitely felt that in this lab. He jumped from that easy first lab that we did to this and it was like a big jump because he was having us convert our units to their units while we have the centimeters—it was like wicked confusing, and he said it could be done in one step, and then he never showed us how to do it in one step. (Sarah, focus group interview, September 29, 2016)

**Failing to provide clarity.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to not provide enough guidance for the student to feel capable of taking the next steps.

Well, when he says, if you do this I can’t help but give you a good grade, but . . . I asked him questions like is this what you wanted . . . and he said well, I’m not going to tell you that because then you’ll never know or something. I don’t know what he said but I was so lost. . . . I just wanted to know where it went and he gave me an answer but I didn’t know what to do still after he answered it. So in that case, it’s not really true that if you do this you’ll get a good grade. (Maggie, focus group interview, September 30, 2016)

I just found myself answering a lot of questions that I had hoped I wouldn’t have to answer—that they would just get into it. But it showed me that maybe a couple of
students still need a little bit more of the hand holding; they’re not really ready to jump into the deep end. (Mr. Green, personal interview, November 11, 2016)

Sometimes students communicated a failure to provide clarity as an experience of chaos in the classroom. “I felt like it was a waste of—we didn’t really have a goal in mind. We were just sitting there, not being productive. It was very chaotic” (Zach, focus group interview, October 6, 2016).

I feel like there’s too much happening in that scene, like a lot of people are talking, he’s kind of mumbling on and on and I didn’t know what he was saying even now, so I feel like I was just really confused. . . . I was like, just lost with what we were doing. I had no idea what the point of it was. (Maggie, focus group interview, November 17, 2016)

**Repeating instructions.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to continue to explain a concept or instructions even after students knew what to do next.

I mean, during that part I was kind of bored. Just like listening to him talk. I was just kind of, I mean, I got what he was saying, but he kept repeating stuff. I was like, oh really? Do you have to say that again? Got it. (Sarah, focus group interview, September 29, 2016)

**Failing to challenge.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to make an activity too easy or reduce the pressure to take action. “This class is not about—I mean, maybe it was just this day, but it’s not a lot about him asking us questions to wake us all up and have us be on our feet to answer a question or whatever” (Maggie, focus group interview, September 30, 2016).
I feel like in that clip itself, in the beginning, we were all engaged in it and once we started to figure out everyone had the same thing we kind of like just stopped saying stuff because we were like okay, we have everything, what else do we need? (Megan, focus group interview, October 30, 2016)

“I was zoned out because I had already gotten the problem right on the homework so... there was no point. I already knew it” (Jason, focus group interview, November 3, 2016).

Involvement Moves

These teacher moves include any actions of the teacher that students or teacher perceive as facilitating engagement by supporting the need for relatedness. These are the moves that contribute to students feeling more connected to and/or cared for by their teacher. Broadly speaking, these are moves wherein the teacher conveys a sense of interest and joy in interacting with the students. They also include ways in which the teacher conveys to the students that he values them. In autonomy support moves, a teacher might respond to or adjust his plans because of a student’s needs or interests; relatedness moves are related but distinct from these types of autonomy support moves. They include the listening and receptive behaviors that often precede and help inform autonomy support moves rather than the actual choices and adaptive behaviors the teacher makes in response to what he learns from listening and receiving the students’ perspectives. The specific ways in which Mr. Green and his students described his involvement moves were by empathizing, connecting, and expressing confidence.

Empathizing. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to take a student’s feelings into consideration when making a decision. In this case, a student may feel that the teacher hears and acknowledges the student’s feelings of
frustration. The teacher may also acknowledge and affirm a student’s effort in the face of adversity or positive intent in the face of confusion.

Yeah, I think that clip showed that, I guess, how empathetic Mr. G is because he was open to the fact that like he probably made a mistake on the video. So a thing like that gives students a chance to voice their reason for why they put the wrong answer, I guess. So, like, it makes it easier for people to raise their hands and explain themselves. (James, focus group interview, September 29, 2016)

I like how understanding [Mr. G] is because, well in the clip, I was asking him if 14% was a good error. Obviously he didn’t like 14%, and he wanted me to go back and do it again, but I had already taken my measurements down again three times, so I’d been outside a lot, and I told him that, and he understood how like, I guess, that was putting in effort but there was just something wrong that he couldn’t see so he said that it was fine. Like, he told me to go over it but he told me that it was fine that I got that number. So it shows that he’s understanding of the struggles that we have. (James, focus group interview, October 13, 2016)

**Connecting.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to endear himself to a student, often through humor. Sometimes students simply commented that they liked Mr. Green: “I like him, and I like the way he teaches” (Sarah, focus group interview, September 29, 2016). More frequently, however, students commented on enjoying Mr. Green’s ability to inject humor and levity into his interactions with them:

Yeah, so he adds a little bit of humor to what you do. . . I think that’s great. I think that laughter is one of the best ways. Like if it’s really dreary out like it was this morning with
the fog, like laughing a little bit will wake you up and get you into it. (Eric, focus group interview, October 13, 2016)

I was just laughing at myself because in that video, the comment that [Mr. G] made right before that was like, there’s just nothing Sophie, because I had put 00. I thought that was funny. . . . Sometimes it’s good because it’ll boost our energy, I guess because sometimes it’s funny, like that one. (Sophie, focus group interview, October 13, 2016)

Expressing confidence. This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been positively affected by the teacher’s choice to celebrate a student’s efforts and/or demonstrate faith in a student’s ability to work through a challenge. Mr. Green indicated that sometimes he would express confidence intentionally in one-on-one interactions: “A couple strategies—like one thing I said right there was, you can be confident. And I try to bolster them up and say you’ve got this. You know how to do this. It worked” (Mr. Green, personal interview, October 14, 2016). However, students also felt positive effects from Mr. Green’s confidence boosting comments to the class as a whole, such as in this conversation from a Week 3 focus group:

Sophie: definitely when he told us that everybody had good grades, that definitely made me a lot more excited (Maggie laughs) I had a lot more energy.

Megan: I felt like it lifted up our confidence (focus group interview, October 13, 2016).

Alienation Moves

These teacher moves include any actions of the teacher that students or teacher perceive as inhibiting engagement by undermining the need for relatedness. Students indicated that these moves make them feel neglected or rejected by the teacher. Participants perceived that the teacher conveyed annoyance or even hostility toward students, or he made them feel dismissed.
and de-valued. The specific ways in which Mr. Green and his students described his alienation moves were by failing to attune and rejecting.

**Failing to attune.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to ignore the student’s feelings, needs, or intentions. This is different from rejecting a need that a student feels he or she has made explicitly clear to the teacher. It is a combination of neglect and failing to take the time to explore or investigate a student’s circumstances before jumping to a negative conclusion. In the case of a failing to attune move, the teacher acts in a way that makes the students feel as though their effort or feelings have been ignored or misunderstood.

One way that students indicated Mr. Green failed to attune was by assuming student silence was a sign of comprehension and/or assent rather than prodding the silence to ascertain and understand student’s confusion.

I know there’s a ton of teachers who do the same thing, because sometimes if they ask a question but no one responds, they assume everyone’s good but it’s not really the case because most times we’re not. (James, focus group interview, October 29, 2016)

A conversation from the other Week 1 focus group also highlighted this move:

Todd: It also looks like in this picture, we’re all kind of spaced out.

Interviewer: Interesting, and it’s like he’s not seeing it? (*Todd nods*).

Maggie: I don’t think he understood.

Todd: how confused we were.

Maggie: Yeah, at all. I think he just thought that we knew what he was saying, but that’s just not the case in this class (focus group interview, October 30, 2016).
Students also commented on when the teacher moved on without taking the time to look at or listen to student feedback.

So it didn’t really matter what we said. Either way we were doing the review first, so I don’t think he should have been like, what do you guys think? And then when we said something been like, well, this is what I think. (Maggie, focus group interview, October 13, 2016)

[H]e was like walking around, but he didn’t stop to actually look to see if we were doing anything… I mean, I was trying to figure it out; I just couldn’t, and he didn’t stop to look and I was—I very visibly had no idea what I was doing, and he still didn’t stop. (Sarah, focus group interview, November 3, 2016)

Failing to attune also took the form of the teacher’s ignoring what students indicated to be palpable tensions, embarrassment, or negative feelings that permeated the students’ experiences.

I sort of feel like the day after the election, that isn’t a great place to start a new lab, because, again, people are going to be still sad and crying about the results, so people aren’t going to be as engaged or focused on what’s going on so I feel like that period should be used as a time for people to gather their feelings as opposed to start something new. (James, focus group interview, November 10, 2016)

Students also commented on this teacher move in a Week 7 focus group:

Maggie: like we weren’t having fun while doing it, not even the videoing; videoing was like a struggle and so embarrassing.

Sophie: so embarrassing.

Todd: yeah, because all the seniors and faculty were just staring at us.
Maggie:… I mean it’s asking us to do a lot, not only to be confused but (laughs).

Sophie: to embarrass ourselves.

Maggie: embarrass ourselves and to not know what the point is (focus group interview, November 17, 2016).

The teacher also failed to attune when he assumed negative intent of students without exploring the intentions behind their actions, like Maggie and Sophie discussed in a Week 7 focus group.

Maggie: But Sophie and I both thought we were done because [Mr. G] didn’t ever say you need to video on Monday. So in chapel, he kind of yelled at us or whatever. .

Sophie: Yeah. . . it was like we weren’t told anything about it and then in chapel he approached me and Maggie and was like, why aren’t you taking videos? and all this stuff.

Maggie: It was kind of mean actually (focus group interview, November 17, 2016).

**Rejecting.** This subcategory refers to moments in which the teacher or a student indicated that he or she felt that a student’s engagement had been negatively affected by the teacher’s choice to refuse to oblige a student’s request or honor a student’s efforts. Most of the rejecting moves that students and the teacher indicated were in Week 7 during an all-class group project.

One way that rejection manifested itself was when the students indicated that they felt the teacher sent mixed messages about his willingness to help them: “Yeah, and I feel like telling us that he’s not going to help us, like that’s not—I feel like he encourages us to ask for help, so
when he’s like, hmmm, I’m not going to like help y’all then it’s kind of like, well, okay then”  
(Sophie, focus group interview, November 17, 2016);

We would ask questions and get shut down; that doesn’t motivate any of us to want to speak in class. So I don’t know. Like, I feel like whenever he says, eh, I know it’s what you want but I’m not going to tell you, like that doesn’t make me want to ask a question because no one’s going to ask a question when they think they’re going to be shut down.  
(Maggie, focus group interview, November 17, 2016)

Another way that students indicated they experienced rejecting moves was when the teacher dismissed their work or suggestions without explanation.

I said, oh can we write down bullet points just so I know what I’m going to talk about, and he kind of like just said in a nice way, no you can’t, because he was like, what do you guys think? And then Sophie agreed with me; she was like, yeah, bullet points would be good as long as we’re not reading the whole entire thing, and then he just completely switched topics. . . . I just got super mad at that point. (Megan, focus group interview, November 17, 2016).

I kind of got a little upset during that clip because [Mr. G] was like, basically what we did on Friday was not going to be used anymore. It was like a practice run, which confused me because I’m pretty sure what we did on Friday could have really helped us on Tuesday. . . . I got upset because what was the point of that? . . . [it] didn’t make sense to me. . . that part affected my willingness to do this lab because, again, all the work that we did—all the hard work that we did—is basically being thrown away. I don’t want to start from square one again. I just want to pick up from where we left off because what we did
before was very useful. So it made me kind of upset. (James, focus group interview, November 17, 2016)

Other Contextual Factors Influencing Student Engagement

The references that students and teacher made to factors outside of teacher moves that influenced student engagement can be described as factors having to do with peers and factors having to do with the environment outside of the classroom. For each of these factors, participants indicated both positive and negative ways in which these factors affected student engagement. Overall, however, students discussed teacher moves significantly more than other contextual factors when indicating what was helping or hindering their engagement. There were 35 conversational turns initiated by students that referred to a contextual factor other than a teacher move that influenced engagement, whereas there were 332 conversational turns initiated by students about how the teacher influenced their engagement. These other factors included peer support, peer inhibition, outside support, and outside inhibition.

Peer support. When referring to the ways that peers supported their engagement, Maggie and Sarah referred to finding their peers helpful on a few occasions. More frequently, however, students indicated that they felt peer support by liking or feeling comfortable with a peer they had to work with. “We got more comfortable like as a group talking to each other so it wasn’t really—like no one was bored” (Maggie, focus group interview, October 6, 2016). “I thought something that made it better was that I had a partner who liked to talk so I didn’t have to do as much talking…. But that just helped out a little—made it interesting, kind of fun” (Zach, focus group interview, October 6, 2016).

Peer inhibition. When discussing the ways that peers inhibited their engagement, students often referred to feeling awkward, uncomfortable, or feeling a tension with peers. “You
can tell that it’s awkward, because when everyone stood up, they sort of stood there, like, what do we do now? It got a little awkward” (Sarah, focus group interview, September 29, 2016). A conversation from a Week 2 focus group also captured this idea:

Sarah: and our group is so different from each other that we really couldn’t do anything.
Zach: Yeah, like our half of the room didn’t say a single thing.
Ellen: I would agree that I guess most of the class was basically separated (focus group interview, October 6, 2016).

**Outside support.** There was one time that Zach referred to being in a good mood because he did well on a geometry test which supported his engagement in Mr. Green’s physics class (Zach, focus group interview, October 6, 2016). The rest of the comments in which students indicated that they were more engaged due to outside factors could be classified as references to the extrinsic motivation to earn good grades. “That’s when I’m the most engaged, because it’s what matters most—the grade” (Zach, focus group interview, October 13, 2016). “I kind of had to dig deeper and force myself to be engaged in this project even though I didn’t like it, because, I mean, it’s a part of my grade, and it’s a project too so it’s a big portion” (James, focus group interview, November 17, 2016).

**Outside inhibition.** Outside inhibitors to engagement fell into three types. First, there were a number of times when students indicated that their engagement was negatively affected by the fact that they were tired. “We were all just like so tired, none of us were even paying attention but he was just like waiting for us to give an answer but none of us were” (Todd, focus group interview, November 3, 2016). Similarly, they indicated the weather as an inhibiting factor as well. “It was cold. It was windy. It started raining on us. It was just gross. I didn’t like being out there” (Sarah, focus group interview, October 6, 2016). Finally, students also referred to
moments where they were pre-occupied with events going on outside of the classroom as factors that negatively affected their engagement. “[Because it was the day after the election] I was questioning going to class that day too. I was just so upset, but I mean I went, but I was not engaged. I was still really sad” (James, focus group interview, November 10, 2016).

I was on my phone the entire time, and you couldn’t see my face, but I was really pissed off in that scene because… the incidents that were happening, that had happened the day before [with two students being kicked out of school]—like someone I was talking to about it was being super insensitive about it. . . and I was just so angry. (James, focus group interview, November 17, 2016)

Summary of Teacher and Student Perceptions of What Makes Engagement Happen

Most of the students’ and teacher’s comments about what made engagement happen focused on teacher moves. These moves included three categories of moves that facilitated engagement (autonomy support, structure, and involvement), and three categories of moves that inhibited engagement (control, chaos/understimulation, and alienation). The teacher provided autonomy support by providing students with options, allowing students to control activities in class, adapting to student needs, and creating relevance for the tasks at hand. The teacher provided structure by creating doable challenges for students, providing clear guidance, offering competence-related feedback, reducing performance pressures, and eliciting responsiveness from the students in class. The teacher provided involvement by empathizing with students, connecting with them, and expressing confidence in them. The teacher created control by talking too much, rescinding students’ freedom, overcomplicating activities, and failing to create relevancy for the work at hand. The teacher created chaos or understimulation by confusing the instructions for tasks, creating too much challenge in assignments, failing to provide clarity for
class activities, repeating instructions unnecessarily, and failing to create enough challenge in assignments. The teacher created alienation by failing to attune to the students’ needs and rejecting their perspectives and efforts.

Participants also indicated there were some contextual factors outside of teacher moves that influenced their engagement. On the facilitative side, participants indicated that peers aided engagement by helping each other and creating a comfortable atmosphere. They also indicated that outside supports like extrinsic goals for good grades facilitated their engagement. On the inhibitive side, participants indicated that peers undermined engagement by creating an awkward or uncomfortable atmosphere. They also indicated that outside inhibitors like the weather and their own exhaustion inhibited engagement.

**Diversity Among Students’ Perceptions of Teacher Moves**

During data analysis, frequency patterns emerged for how many comments students made that fell into each category of teacher moves. Over the course of the 14 focus group sessions, students initiated 332 conversational turns about teacher moves that helped or hindered their engagement (see Appendix F). Table 4.4 shows numerical data for the types of comments each student initiated. The rows indicate each student’s pseudonym and the number of focus group sessions in which he or she participated. The columns indicate the 6 different teacher move categories. Each cell contains the total number of conversational turns each student initiated within a particular teacher move category. Within each student’s row, subsumed underneath teacher move comment totals, there are percentages that reflect the ratio of conversational turns each student initiated as a proportion of how often the student commented on moves relating to each basic psychological need. Since there is an engagement-facilitative and an engagement-inhibitive category for each psychological need, these percentages are based on the summation of
both the facilitative and inhibitive category for each psychological need. Thus, each percentage would be approximately 33.3% if the student in question reported feeling the engagement effects of teacher moves equitably distributed among the three psychological needs.

For example, Sophie is the closest of anyone in the class to noticing an equitable number of moves from Mr. Green that addressed each psychological need. The number of comments she initiated about autonomy support and control moves added together makes up almost 26% of the conversational turns she initiated about Mr. Green. Adding up her comments on structure and chaos/understimulation moves equates to 37% of the conversational turns she initiated, and the same is true for the involvement and alienation moves on which she commented when they are added together.

In the far right column, there is a ratio reported in summative numbers and percentages that shows the comparison of how many positive (i.e., engagement facilitative) and negative (engagement inhibitive) comments each student made over the course of the focus groups in which he or she participated. Thus, for example, Megan initiated the exact same number of comments about Mr. Green’s engagement facilitative moves as she did about his engagement-inhibitive moves. Thus, this table shows differences between students in terms of how many and what types of teacher move comments each student made over the course of their focus group participation.

Table 4.4

Frequency of Each Type of Teacher Move Comment Initiated by Each Student

<table>
<thead>
<tr>
<th>Student (# of)</th>
<th>Aut Sup</th>
<th>Control</th>
<th>Structure</th>
<th>Chaos-U</th>
<th>Involve</th>
<th>Alien</th>
<th>Total: Facilitating/Inhibiting (by student)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FGs</td>
<td>Count</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>-----</td>
<td>-------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Jason</td>
<td>(3)</td>
<td>60.0%</td>
<td>44.5%</td>
<td>5.6%</td>
<td>61.1%/38.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zach</td>
<td>(6)</td>
<td>46.1%</td>
<td>50%</td>
<td>3.8%</td>
<td>11.5%/88.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eric</td>
<td>(4)</td>
<td>39.4%</td>
<td>54.5%</td>
<td>6.1%</td>
<td>72.7%/27.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Megan</td>
<td>(6)</td>
<td>36.1%</td>
<td>58.4%</td>
<td>5.6%</td>
<td>50.0%/50.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maggie</td>
<td>(5)</td>
<td>9.6%</td>
<td>67.4%</td>
<td>23.1%</td>
<td>25.0%/75.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophie</td>
<td>(5)</td>
<td>25.9%</td>
<td>37.0%</td>
<td>37.0%</td>
<td>33.3%/66.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>James</td>
<td>(6)</td>
<td>37.1%</td>
<td>42.8%</td>
<td>20%</td>
<td>39.9%/60.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sarah</td>
<td>(5)</td>
<td>38.8%</td>
<td>51.0%</td>
<td>10.2%</td>
<td>34.7%/65.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Todd</td>
<td>(7)</td>
<td>42.2%</td>
<td>46.7%</td>
<td>11.1%</td>
<td>42.2%/57.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ellen</td>
<td>(4)</td>
<td>50%</td>
<td>37.5%</td>
<td>12.5%</td>
<td>12.5%/87.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cody</td>
<td>(1)</td>
<td>22.2%</td>
<td>66.7%</td>
<td>11.1%</td>
<td>22.2%/77.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Class Totals: 53 63 68 107 10 37 338
34.3% 51.8% 13.9% 38.8%/61.2%

Class averages (in the bottom row) offer a rough estimate of the students’ overall perceptions of how much Mr. Green’s behavior addressed each of the three psychological needs. If a student’s personal averages (the lower portion within each row) were substantially higher than the overall class average (the lower portion of the bottom row), it served as a sign that that particular student tended to note teacher behaviors related to a particular psychological need.
more frequently than other students. Based on this, I identified certain students\(^3\) who tended to comment on teacher moves relating to one of these three psychological needs more frequently than the norm. Below, I describe the comments of certain students who demonstrated similar patterns of commenting on teacher moves in a particular psychological need category more than the class average.

**Autonomy-Oriented: Jason and Zach**

While both Zach and Jason noted Mr. Green’s autonomy-related moves more than most students, Zach tended to comment more on controlling moves while Jason commented more on autonomy supportive moves. Regardless of whether they indicated that Mr. Green was more or less supportive of their engagement through his autonomy-oriented moves, both of these students’ comments overlapped in that they indicated appreciating being left alone to do science work.

Zach tended to initiate more conversational turns about controlling teacher moves especially when he saw no point to what Mr. Green was doing or felt that Mr. Green was forcing the students to do work that was not “real” science work.

> I was telling you how teachers can sometimes try to make things too fun and then it’s boring. I think when he had us hang up our objects, and we went through all of that. I thought that was just a little too far trying to make it hands on. (Zach, focus group interview, September 29, 2016)

Most traditional classes you have units and you learn specific things in that unit, but here we’re just doing lab after lab after lab. . . . It just doesn’t feel like we’re—maybe we are

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\(^{3}\) I excluded consideration of Cody and Ellen because they participated significantly less than the rest of the students in the focus groups
learning stuff, but it’s not like, I don’t know—it’s a little different than most other classes. (Zach, focus group interview, October 6, 2016)

“I don’t like doing labs. . . . I prefer sitting down and doing a worksheet or just, I don’t know, just out of the textbook” (Zach, focus group interview, October 13, 2016).

I kind of felt like this whole shark tank thing was—it got across what [Mr. Green] was trying to say, but he could have just told us straight out, length affects it the most, the other three aren’t as important. . . . a lot of groups got conflicting results so there was no point in doing it. (Zach, focus group interview, November 3, 2016)

In his final interview, Zach elaborated on his preferences for learning independently. He indicated that his engagement in learning was facilitated by being left alone to do work, but the kind of work he preferred was oriented more toward reading and writing rather than hands-on science.

I would just like a traditional class where. . . you learn out of a textbook and you take notes and stuff, instead of lab after lab after lab. . . . I’m not really a hands-on person. I like reading about it. . . . In an ideal world, it would just be reading. . . . And then you’d have more time in your day. . . . to study what interests you in kind of, not really self-teaching, but kind of self-teaching. (Zach, personal interview, December 5, 2016)

Jason tended to initiate conversational turns that were about teacher moves that he indicated were supportive of his engagement through autonomy support. He indicated that he enjoyed hands-on work and being left alone to figure things out for himself.

I thought it was good because he wasn’t really trying to control what we were doing, but he was there if we needed help. . . . I liked it. I was into it. It was sort of like real life application of things we were learning. (Jason, focus group interview, October 13, 2016)
It’s sort of the same thing I said with the line of sight lab. He’s there if you need help, but otherwise you sort of do stuff on your own and learn it on your own. . . . I think it’s a lot more engaging for me because it’s not sort of just sitting there and listening to him just try to give you information; you’re really doing it yourself and learning it yourself.

(Jason, focus group interview, October 13, 2016)

Just applying it to the real world and make it sort of challenging. Like the unit lab where we were doing conversions, I was engaged in that because I wanted to sort of figure out the problem that everyone else was having with it. (Jason, personal interview, December 5, 2016)

**Competence-Oriented: Maggie, Megan, and Eric**

The conversational turns that Maggie, Megan, and Eric initiated about teacher moves that related to competence tended to focus on confusion on the negative side and feeling like they knew what to do on the positive side.

Megan, Maggie, and Eric initiated more comments than their peers that indicated their engagement was negatively affected by the confusion they felt when the teacher pushed them toward more independence.

[W]e were showing him what we had, and I asked him questions like, is this what you wanted… and he said well, I’m not going to tell you that because then you’ll never know or something. I don’t know what he said, but I was so lost. (Maggie, focus group interview, September 30, 2016)

Like for the review sheet that [Mr. G] had us make, it was kind of hard because you didn’t know—like, I personally couldn’t remember everything we had studied. . . . I think
he could have at least given us some sort of rubric. (Eric, focus group interview, October 13, 2016)

“He didn’t explain what we were supposed to do. We were kind of looking for something to go by. . . like, you’ll do this, you’ll do this, you’ll do this; then I think that would have been better” (Megan, focus group interview, November 17, 2016).

On the other hand, when these students felt like they knew what to do, they were more likely to comment that their engagement was positively affected by knowing what to do next even when some other classmates might have indicated they felt the activity was boring or irrelevant. “I feel like it was smooth once we figured out [how to hang objects in a lab project]…. and we kind of just knew, this was going to go here, and this is going to go here” (Megan, focus group interview, October 6, 2016).

When [Mr. G] gives us structure as a whole group, it’s a lot easier because then no one person is taking over control. He’s making sure that everybody has distributed work. Like everyone is doing a part, no one is doing all of it while others are sitting out. (Megan, personal interview, December 12, 2016)

When it came to competitive and interactive activities, Eric especially indicated that the reason that these were more engaging to him was because it gave him a clear, doable challenge, often with useful feedback.

I thought that it was like, kind of good how instead of just like quizzing us or anything on the sig figs, he just had us do it all as a class, and there was no grading or anything just a little extra practice to see who knew it and who didn’t. (Eric, focus group interview, October 13, 2016)
I think it allows you to learn what you did wrong because with Ed Puzzle there’s really no other way to learn if you did like what Collin did and put a bunch of zeros after the decimal place, and then if you got that wrong and, I mean, you wouldn’t really know what you did wrong unless you saw what other people’s answers were. (Eric, focus group interview, October 13, 2016)

**Relatedness-Oriented: James and Sophie**

James was a student who commented on Mr. Green’s empathizing moves when others were focused on different aspects of the teacher’s behavior. In one incident, Mr. Green was introducing an idea at the beginning of class, and Todd brought up the homework from the night before and how he believed that he got a question wrong because Mr. Green was unclear with his explanation. Mr. Green offered to review the homework at that moment. When he did, he asked the students what they had seen in his video explanation that caused confusion and told them that they would get credit back for that question because of the miscommunication. When Mr. Green reflected on this video clip, he indicated that he saw himself as supporting autonomy by offering students choices about how to conduct class. Sarah indicated that she felt understimulated by the activity of reviewing homework; Cody and Maggie each brought up how confused they were by Mr. Green’s explanation; but James noted Mr. Green’s empathetic move as a factor that facilitated his engagement in class.

Yeah, I think that clip showed that, I guess, how empathetic Mr. G is because he was open to the fact that like he probably made a mistake on the video. So a thing like that gives students a chance to voice their reason for why they put the wrong answer, I guess. So, like, it makes it easier for people to raise their hands and explain themselves. (James, focus group interview, September 29, 2016)
Similarly, when James reflected on a scene from class where Mr. Green was walking around and checking in with students one-on-one while they worked, he also highlighted an empathizing move.

I like how understanding [Mr. Green] is because, well in the clip, I was asking him if 14% was a good error. Obviously he didn’t like 14%, and he wanted me to go back and do it again, but I had already taken my measurements down again three times, so I’d been outside a lot, and I told him that and he understood how like, I guess, that was putting in effort but there was just something wrong that he couldn’t see so he said that it was fine. Like, he told me to go over it but he told me that it was fine that I got that number. So it shows that he’s understanding of the struggles that we have. (James, focus group interview, October 13, 2016)

Sophie and James also noted moments in which they indicated that they felt Mr. Green used humor to connect with the class. In a video clip in which Mr. Green was reviewing homework at the beginning of class and Todd kept repeating that he thought they should all get a completion grade because the homework was hard, Mr. Green responded with, “yeah, I’ll complete the grading” (class video recording, October 6, 2016). James indicated that he thought that moment was funny. Even though they were in separate focus groups, Sophie agreed and went on to add,

I was just laughing at myself because in that video, the comment that he made like right before that was like, there’s just nothing Sophie, because I had put 00. I thought that was funny. . . . Sometimes it’s good because it’ll boost our energy, I guess because sometimes it’s funny, like that one” (Sophie, focus group interview, October 13, 2016).
James and Sophie also indicated that their engagement levels were negatively affected by Mr. Green’s choices to ignore outside tensions that made class uncomfortable. Mr. Green’s class was the first class to meet on the day after the 2016 presidential election. Both James and Sophie indicated that they were upset by the election as an outside force in and of itself. However, each of them—in separate focus groups—went on to discuss how they felt Mr. Green’s lack of response was a failure to attune to their needs.

I sort of feel like the day after the election, that isn’t a great place to start a new lab, because, again, people are going to be still sad and crying about the results, so people aren’t going to be as engaged or focused on what’s going on so I feel like that period should be used as a time for people to gather their feelings as opposed to start something new. (James, focus group interview, November 10, 2016)

“It could have been in a way helpful if maybe [Mr. Green] had talked about [the election] a little bit” (Sophie, focus group interview, November 9, 2016). While James and Sophie had students who agreed with them once they brought these comments up, most of the other comments in response to the video clips from this class that were initiated by other students in James’s focus group were about confusion they indicated that they felt over the lab Mr. Green was introducing, and the comments initiated by students in Sophie’s focus group indicated that they thought the topic of the lab was interesting.

Sophie and James also indicated that their engagement was negatively affected by moves that Mr. Green indicated that he believed were challenging students to have more independence, but Sophie and James saw as Mr. Green failing to attune to their needs. In a video clip in which Cody asked a question, Mr. Green responded with “I’m not going to say exactly what it is. . . . I do want you to struggle with it a little bit because I think that once you get it yourself, you’ll
really get it” (class video recording, November 11, 2016). James said that he was frustrated because Mr. Green should have known that they were confused and needed help, while Sophie (in a separate focus group) went even further to indicate that she felt Mr. Green was not faithful to his own words:

Yeah, and I feel like telling us that he’s not going to help us, like that’s not—I feel like he encourages us to ask for help, so when he’s like, hmmm, I’m not going to like help y’all then it’s kind of like, well, okay then. (Sophie, focus group interview, November 17, 2016)

All of the other comments initiated by other students in James’s focus group indicated that they felt their engagement was negatively affected by Mr. Green’s lack of clarity. In Sophie’s focus group, however, Maggie and Ellen also initiated comments of their own in which they indicated that they felt their engagement was negatively affected by Mr. Green’s alienating moves, and they felt “all alone” or “awkward” about how to ask questions (focus group interview, November 17, 2016).

**Summary of Diversity Among Students’ Perceptions of Teacher Moves**

In summary, there were differences between students in terms of how frequently they commented on Mr. Green’s different teacher moves. Overall, approximately 14% of the comments the students initiated about Mr. Green related to relatedness-oriented teacher moves, approximately 34% related to autonomy-oriented moves, and approximately 52% related to competence-oriented moves. Students who spoke substantially more about autonomy-oriented moves tended to comment that they became more engaged when Mr. Green left them alone to do their work. Students who spoke substantially more about competence-oriented moves tended to comment that they became more engaged when Mr. Green provided clear guidance that
empowered the students to know how to take next steps during class activities. Students who spoke substantially more about relatedness-oriented moves tended to comment that they became more engaged when Mr. Green sought to understand their perspectives or connected with them through humor.

**Differences Between Teacher and Students’ Interpretations of Teacher Moves**

Each participant commented on teacher moves that he or she saw occurring in each video clip used in each of the focus groups or weekly teacher interviews. Analysis of these teacher move comments provided evidence that there were some video clips where the teacher and a substantive number of students disagreed about what type of moves the teacher had enacted in the clip. After reviewing each participant’s perceptions of the categories of teacher moves that he or she indicated was inhibiting and/or facilitating student engagement in each video clip event (see Appendix G), I identified video clips in which there was considerable difference between what the teacher indicated he thought was going on and what multiple students indicated they thought was going on. When I compared the categories of teacher moves upon which the teacher and the students commented with the types of events from the video clips, patterns emerged about the types of classroom events that elicited certain types of teacher-student differences in perceptions. Below I describe four types of classroom events in which teacher and students indicated different interpretations over the effects of the teacher’s behaviors. Each of these event types, including the subsequent patterns in teacher and student reflections on the event, occurred at least twice over the course of the study.

Table 4.5

**Differences Between Teacher and Students’ Interpretation of Teacher Moves**

<table>
<thead>
<tr>
<th>Type of Classroom Event Category</th>
<th>Video Clips</th>
<th>Brief Description of Differences in Teacher vs. Student Perceptions</th>
</tr>
</thead>
</table>

134
Going over students’ work  
1.5, 3.3, 3.5, 4.4, 5.2  
The teacher indicated that he thought he was providing student-centered feedback, but a number of students indicated that they felt that the teacher neglected to investigate and understand their needs.

Pushing independence  
1.6, 7.1  
The teacher indicated that he thought he was encouraging students to work more independently, but a number of students indicated that they felt misunderstood by the teacher. Students indicated that Mr. Green did not recognize how confused they were and felt like their attempts to understand were being rejected by the teacher.

Inauthentic choice  
3.5, 5.6, 6.2, 7.3  
The teacher indicated that he thought he was offering students an opportunity to take control of a class activity, but a number of students indicated that they felt their voices did not actually matter. Students indicated that they believed the outcome of an activity where the teacher elicited student input was already pre-determined, and thus, student input was not an integral part of the decision-making process.

Now you see me, now you don’t  
1.3, 3.5, 6.5  
The teacher indicated that he thought he was empowering student agency, but a number of students indicated that their engagement was more influenced by the ways the teacher did or did not connect with them.

Going Over Students’ Work

The first type of incident that inspired differences between teacher and student perceptions of what was happening in the classroom was when the teacher indicated that he thought he was providing student-centered feedback, but a number of students indicated that they felt that the teacher neglected to investigate and understand their needs. In each of the five events (video clips 1.5, 3.3, 3.5, 4.4, and 5.2) in which this pattern of teacher and student responses occurred, the teacher was projecting a piece of student work on the board from his computer, and he was modeling how to correct or improve it. In the clip from Week 1, he was projecting a computer program called Mathematica from his laptop to the board. Mr. Green required students to learn how to use Mathematica to write up lab reports and conduct mathematical calculations.
needed for their labs. In the video clip, he asked students if they would like to go over a conversion problem, and then he used Mathematica to show the students how to work through a problem that Todd said he had trouble completing. In the Clip 3 from Week 3, Mr. Green was projecting the students’ responses to the Ed Puzzle quizzes from their homework the night before, grading it live, and stopping to explain incorrect responses. Ed Puzzle is an online flipped classroom platform. The students watched 5-20 minute videos created by Mr. Green for homework and be required to answer embedded questions as they watched. Students had to complete these two to three times a week, and Mr. Green would always grade them live at the beginning of class the next day. In Clip 5 from Week 3, Mr. Green was projecting a review sheet that a student had created as a homework assignment the night before and commenting on how thorough and useful he believed that review sheet would be for students to study for the test. In the clip from Week 4, Mr. Green was projecting Megan’s test on the board after having digitally graded the tests. He showed the students how they could complete test corrections, if they wanted to do so. He did this by identifying a problem Megan got wrong and writing out an explanation along with a correction to show how students could earn back credit. In the clip from Week 5, Mr. Green was projecting a copy of a practice abstract to a lab, which Maggie wrote. He was reviewing certain parts of Maggie’s abstract and asking students what should change so that it met the criteria he had written on the student’s rubric, referred to as their lab details sheet. At one point, he asked a question and after six seconds of silence Mr. Green said, “Have we lost our nice relationship with each other? Does anyone want to work with me a little bit?” (class video recording, October 26, 2016). After Mr. Green said that he would wait, Todd responded. Mr. Green followed up on Todd’s response with another question about the content of the abstract and there were ten seconds of silence before Todd offered another idea.
In his reflections on one of these events, the teacher indicated that he believed he was providing useful structure for the students.

I think it’s helpful for students if they see and hear my mental process as I grade it. So if they get to see behind the curtain and see, oh if this is how I’m going to get graded. It’s kind of like explaining the rubric. (Mr. Green, personal interview, November 3, 2016)

Many times he indicated that he believed he was using a student-centered approach by looking at the students’ work.

I feel like using someone’s real thing up on the screen is a lot more engaging than going over some master key or something. I’m trying to make it more personal—she would do this, she would do that. (Mr. Green, personal interview, October 27, 2016)

Additionally, Mr. Green indicated that he felt that the student-centered feedback processes that he embedded regularly in class were helping students especially because the stakes were low and the students felt that it was safe to make mistakes.

There’s some laughter to it, but hopefully the classroom feels safe enough now that no one’s getting called out. . . I think I make the quizzes such that there are—like, if you just write down what the teacher said, you get it. No one’s really getting zeros on these unless they don’t do them. (Mr. Green, personal interview, October 14, 2016)

I like it when they throw stuff up there that has flaws in it so we can learn from that. It at least convinces me that for most kids this is a pretty safe zone where they can air out their less than perfect work. (Mr. Green, personal interview, October 27, 2016)

James, Zach, Sarah, Eric, and Jason indicated that they felt that these events were examples of the teacher not taking the time to understand the kind of feedback they actually needed. They indicated that Mr. Green was belaboring work that they already understood. These
students indicated that these were disengaging experiences because the teacher failed to attune to their needs and subsequently led them through an activity that was irrelevant to them. The conversation in response to Video Clip 3 during a Week 3 focus group highlights this theme:

James: I hate when [Mr. Green] does that. . . That’s when I get the most disengaged, honestly, because I feel like if you had trouble on the homework, then just tell him about it. I don’t feel like he should have to go through everyone’s answers and grade them live. I don’t see the point in that. . .

Jason: Well, I kind of agree with James because I mean, it’s like grading something and I don’t really think that’s class material. . . maybe just not go over every single answer.

James: I feel like a solution maybe to this problem, is that maybe he could ask the class prior to him grading live if anyone had trouble with it, and if anyone did then he could grade it live to understand where and why this was happening (focus group interview, October 13, 2016).

A conversation in response to Video Clip 5 from a Week 3 focus group also highlights this theme:

Eric: I mean, I pretty much knew all of the review stuff so I was zoning out.

Jason: Yeah, I feel like I was completely zoned out. (Zach nods). . .

James: I do feel like what he actually did was not really engaging because he was just showing you the problems and I just didn’t feel connected to it.

Also, a conversation in a focus group from Week 5 illustrates this point:

Sarah: ‘cause I remember sitting there and [Mr. Green] said I’ll wait, and I was like no one’s going to respond, you might as well just move on because no one was going
to respond. Everyone was bored at that point, this was like the fifth time we
touched the triangulation lab. I was like, oh my god, I’m like falling asleep. It was
bad. . . .

James: I think just go to the Mathematica detail sheet [that Mr. Green had already
provided] and go to the section that says abstract and in there it basically just
shows you how to format yours, and that’s all he could have done to make us
know how to do it (focus group interview, October 13, 2016).

Some students who did not indicate that these activities were too easy still indicated that
the teacher had failed to attune to their needs. Todd and Maggie both indicated that they felt that
Mr. Green was not truly trying to understand their experiences when he gave feedback on student
work in these situations. “He was going to do it either way even if only one person raised their
hand… it doesn’t matter. My hand doesn’t need to go up” (Maggie, focus group interview,
September 30, 2016);

I remember at the beginning of the year he gave us like a survey on Ed Puzzle saying
how good are you with computers, and most of us said that we know how to do stuff but
we’re not good with using computers, and he like didn’t take that into consideration at
all. (Todd, FG focus group interview, September 30, 2016)

They both agreed on the teacher’s failure to attune to their needs in a Week 3 focus group:

Maggie: [Mr. Green] was like, ‘eh, sorry it’s not my decision,’ or something like that
[when Todd asked him to grade the homework for completion rather than
accuracy].
Todd: It’s like, I feel like he should have made it a completion grade because so many people got [these particular homework problems] wrong (focus group interview, September 30, 2016).

**Pushing Independence**

The second type of incident that inspired differences between teacher and student perceptions of what was happening in the classroom was when the teacher indicated that he thought he was encouraging students to work more independently, but a number of students indicated that they felt misunderstood by the teacher. In each of the events (class video recording 1.6, September 22, 2016; class video recording 7.1, November 11, 2016) where this pattern of teacher and student responses occurred, the teacher was reviewing what students need to do to complete a lab report that they have been working on for a number of days already. In these incidents, the teacher made a comment about wanting the students to figure out what to do next on their own. In the clip from Week 1, Mr. Green polled the students to see how far everyone has progressed, then he asked the students if what they needed to do made sense. James said yes, and Cody said no. Mr. Green began to explain some of what they need to do next and then said, “You’re going to have to do a little thinking, and I’ve gotta tell you, this is me kind of tossing you off the diving board to try to swim” (class video recording 1.6, September 22, 2016). In the clip from Week 7, Cody asked Mr. Green a question about how to do the next steps in the lab. Mr. Green’s initial response was, “Well, I’m not going to say exactly what it is” (video class recording 7.1, November 11, 2016). He proceeded to explain some of the process they would need to use, and then said, “I do want you to struggle with it a little bit because I think that once you get it yourself, you’ll really get it” (video class recording 7.1, November 11, 2016).
In his reflections on these events, Mr. Green indicated that he believed he was helping students by providing resources and serving as a coach. In response to the video clip from Week 1, Mr. Green acknowledged that the students did not respond well to his encouragement, but he did not offer an explanation of what he believed went wrong; instead, he noted how he was trying to support student engagement:

I got the sense that the class was pretty much on top of this lab, so maybe they were ready to spend a little bit of time struggling with it a little bit. So I said that part about tossing them off the diving board to swim, you know, you’re in the deep end now, and you can help each other out, but I’m not going to just volunteer answers for you. And if I remember, it didn’t go so well. . . . I guess that’s why I make those resources [like Ed Puzzle videos], so they can do it at their own pace and pause it where they want to and practice it a little. (Mr. Green, personal interview, September 30, 2016)

In response to the clip from Week 7, Mr. Green again reiterated how he saw his actions as supportive of student engagement:

I’d like to back off their methods of understanding and be more like a coach. Like, you know, help prompt them in the way that they should go. . . so there I’m saying exactly my philosophy; like, I want you to wrestle with it; I want you to struggle with it. (Mr. Green, personal interview, November 18, 2016)

In response to both of these events, students indicated that Mr. Green did not recognize how confused they were and even felt like their attempts to understand were being rejected by the teacher.

I know there’s a ton of teachers who do the same thing, because sometimes if they ask a question but no one responds, they assume everyone’s good (Zach smiles and chuckles)
but it's not really the case (*James chuckles*) because most times we’re not. I mean, I feel like he could have just, like, done a certain example that could have, I don’t know, pertained to this lab especially because no one knew what to do. He didn’t explain most of how we were supposed to convert everything. (*James, focus group interview, September 29, 2016*)

Students in the other focus group that met in Week 1 seemed to agree with James:

Cody: Like, he wasn’t going to explain it to us--I figured he was going to explain it to us, [but instead he used] too many big words; I have no clue what’s happening [in that video clip].

Maggie: Yeah, I just didn’t know what he was saying. . . .

Todd: Like, there’s a point in time when we just don’t know what to do. . . .

Maggie: I don’t think he understood.

Todd: how confused we were.

Maggie: Yeah, at all. I think he just thought that we knew what he was saying, but that’s just not the case in this class (*focus group interview, September 30, 2016*).

In response to the video clip from Week 7, the students expressed similar frustrations.

He also expected us to know how to do it because I remember he kept saying that I’m not going to do it for you, and you guys should know how to do it. But I feel like everyone was kind of confused, so I was kind of frustrated about how he wasn’t trying to help us when most of us were confused on what to do. (*James, focus group interview, November 17, 2016*)

The students in the other focus group from Week 7 also discussed this issue:
Maggie: I just didn’t like that class. . . . For example, in the beginning, Cody asked a question, and he was like, well I’m not going to say exactly what it is, and then he was like—and then later he’s like, I like it when you guys struggle and then figure it out on your own. Sometimes I guess that benefits us in a way that we’re kind of independent with how we learn, but I don’t always like to feel like I’m completely alone (chuckles) like on my own.

Sophie: me too. . . . I feel like telling us that he’s not going to help us, like that’s not—I feel like he encourages us to ask for help, so when he’s like, hmmm, I’m not going to like help y’all then it’s kind of like, well, okay then. . . .

Ellen: I think he could have rephrased the part where he said, oh you guys you should sort of do this on your own. Like maybe he could have said something along the lines of, so I want you guys to try this on your own, but you can probably still consult me.

Sophie: (points to Ellen) yeah.

Ellen: on those difficult questions. . . . I mean, I can see how it sort of set it in a negative connotation but, yeah. So that’s probably why people sort of felt a bit awkward about that. . . . I mean, for the most part I didn’t really know what to do at that point since I did have some questions I needed to ask him for the lab, so, I don’t know. I guess I was a bit upset about it (focus group interview, November 17, 2017).

**Inauthentic Choice**

The third type of incident that inspired differences between teacher and student perceptions of what was happening in the classroom was when the teacher indicated that he
thought he was offering students an opportunity to take control of a class activity, but a number of students indicated that they felt their voices did not actually matter. In each of the events (video clips 3.5, 5.6, 6.2, and 7.3) in which this pattern of teacher and student responses occurred, the teacher was asking the students to share their opinions about what should happen or what mattered most regarding a class activity. In the clip from Week 3 (also referenced above in the section, *going over students’ work*), Mr. Green asked students whether they would like to review for their test first or work on their labs first. In the clip from Week 5, Mr. Green asked students to brainstorm all the possible factors that could influence the period of a pendulum swinging, and Todd suggested air resistance; Mr. Green then explained that the purpose of their upcoming “Shark Tank” project would be for the students to determine which factors actually mattered to the pendulum’s period. This clip was also a precursor to the clip from Week 6, where the students were reporting out their findings from their “Shark Tank” project. In that clip, Mr. Green told the students that length was the only factor that mattered. Earlier in Week 5, Mr. Green had explained that the idea behind the “Shark Tank” project was based on the T.V. show of the same name where budding entrepreneurs present sales pitches to a panel of judges, and the judges choose which ones will move on and get an investment contract. In the clip from Week 7, Mr. Green asked students to contribute ideas for how they should outline a slideshow that they would use to present the findings of a chapel frequency project to the school chaplain; Mr. Green wrote their suggestions on the board, and he said “no” twice to different student suggestions. In the preceding video clip he had told Todd that he did not like the students’ idea for how to design the presentation that they had already started.

In his reflections on these events, Mr. Green indicated that he believed he was empowering student agency to drive the direction of the class activities.
I feel like I gave them an amount of agency because I definitely had an opinion there, and it’s interesting that the three people who responded all were kind of the opposite of what I thought. . . . If they had all voted to do the lab first, I would have been fine with that. (Mr. Green, personal interview, October 14, 2016)

I hadn’t thought about air resistance, but Todd came up with it so I let him run with it, and they pulled out the fans and tried it out. In the end, they’re going to realize that the length of the string is what matters most, but they have a lot of control to choose which ones they want to test and then to present it how they want in the shark tank. (Mr. Green, personal interview, November 3, 2016)

[The students are] looking for some structure, and as long as I’m not saying, here is the structure, follow, follow, follow; I’m asking for some input—again, it’s just walking that line. . . . This could have been an opportunity for a kid to jump in and say, you know, no, I think the data table actually really does show—you know, I really would have entertained that. . . . I would have been open to it, but I want to have them be able to defend their ideas I guess. (Mr. Green, personal interview, November 18, 2016)

Many students, however, indicated that they believed the outcome of these activities was already pre-determined, and thus, their input was not an integral part of the decision-making process. A number of students agreed in response to the video clip from Week 3:

Maggie: I think he asked for our suggestions, but he already had a plan.

Todd: Yeah.

Maggie: So it didn’t really matter what we said. Either way we were doing the review first, so I don’t think he should have been like, what do you guys think? And then when we said something been like, well, this is what I think. . . .
Megan: I feel like, for the choosing, I agree with [Maggie] on the whole thing on how he kind of had something set in his mind (focus group interview, October 13, 2016).

Students responded to the Shark Tank activity with these feelings in response to video clips from both Week 5 and Week 6. In Week 5, Zach initiated the conversational turn:

Zach: I kind of felt like this whole shark tank thing (James chuckles) was—it got across what he was trying to say, but he could have just told us straight out, length affects it the most, the other three aren’t as important.

James: I found the shark tank thing to be very ineffective for me. . . I just felt like it would have been the same effect if he had just told me what it was.

Sarah: It felt like a waste of my office hours too, because I had to go in and finish it (focus group interview, November 3, 2016).

In Week 6, Todd initiated the conversational turn:

Todd: it wasn’t a shark tank at all (James points to Todd and nods). . . like, we weren’t really trying to sell anything to him, and also there wasn’t like a judge making decisions

Eric: It was more just like a discussion. . . because the shark tank was just kind of like people talking, and I thought that—I think I zoned out for a little bit of that. I wasn’t really listening to the other people that much (focus group interview, November 10, 2016).

The video clips on the chapel project from Week 7 elicited the most responses on this theme:

Maggie: And then, in the beginning of the class, he told us that our whole thing that our table (Maggie motions back and forth between her and Todd) had done was like
wrong (Todd nods) and we had worked so hard in the last class, and he was like, I
didn’t really like what you guys did, so we were like, okay.

Sophie: That was so annoying.

Todd: because like, we had already started, and last class he said, yeah that’s a good idea.

And then this class he was like, nah.

Maggie: He does that a lot though. Changes his mind, a lot.

Sophie: Yeah!

Maggie: with what he wants and what he doesn’t want….

Sophie: . . . It would make me so angry, because it seemed like everything that we were
presenting was just wrong.

Maggie: (chuckles) yeah.

Sophie: Like we were just not correct and—especially me. I don’t know. It seemed like
every time I asked him, what do you want me to do for a slide, he’d be like, meh,
I don’t know. I was like, (shrugs and holds up hands palms up, sneers) okay.

(Maggie chuckles). . . It’s just like—like don’t completely not give me help for
something. (Maggie nods) Like, if I need help or something and I’m going up to
you and asking you, help me. Don’t be just like, mmm, (bobbles head back and
forth) you figure it out all by yourself. That’s literally in no way going to benefit
me (focus group interview, November 17, 2016).

James commented in a similar way in the other focus group from Week 7:

I kind of got a little upset. . . because he was like, basically what we did on Friday was
not going to be used anymore. It was like a practice run, which confused me because I’m
pretty sure what we did on Friday could have really helped us on Tuesday. . . that part
affected my willingness to do this lab because, again, all the work that we did—all the hard work that we did—is basically being thrown away. (James, focus group interview, November 17, 2016)

**Now You See Me, Now You Don’t**

The fourth type of incident that inspired differences between teacher and student perceptions of what was happening in the classroom was when the teacher indicated, once again, that he thought he was empowering student agency, but a number of students indicated that their engagement was influenced more by the ways the teacher did or did not connect with them. In each of the events (video clips 1.3, 3.5, and 6.5) in which this pattern of teacher and student responses occurred, the teacher asked for student input. In the clip from Week 1, Mr. Green began class, and Todd interrupted him to say that the way Mr. Green explained something in the Ed Puzzle homework video was confusing; three other students agreed with Todd; Mr. Green responded by saying, “if it was my bad or it was a bad question, then I’ll just give you credit, it’s fine. So, we’ll go over it. Um, are we saying we want to do that now? I actually had an opening. Alright, we’ll just do it now” (class video recording 1.3, September 20, 2016). In the clip from Week 3 (also discussed above), Mr. Green asked the students whether they would like to do test review or work on their labs first; immediately before that, he told the students,

So, I am proud of you guys. We missed a class due to that play and I thought we would be having to backtrack and really sprint to catch up, but as far as I can tell you guys are at the same place as my other class even though they’re one day ahead in the schedule. But I looked over your midterm grades and I didn’t have to write a comment about anyone in this class. You guys are doing really well (*Sophie makes a double thumbs up and looks towards Maggie*) as a class. (class video recording 3.5, October 10, 2016)
The clip from Week 6 was from the class that took place first thing in the morning the day after the 2016 presidential election. In it, Mr. Green introduced the chapel frequency project by showing a short video about traffic frequency and then asking students to brainstorm all the places where they experience foot traffic backups on campus.

Similar to the clips discussed above, Mr. Green indicated that he believed he was empowering student agency to drive the direction of the class activities in his reflections on these clips.

I have a relative plan of where I’m going to go, but I’m definitely not going to be a slave to some plan I wrote in the future... I wanted to kick off with this activity and then maybe come back to it later, but in some ways it puts the power and control in the class—or at least the most vocal people in the class... in terms of student engagement, if I as a teacher am responsive to kind of where they want to go a little bit, as much as I can, and that comes from me sometimes saying okay, you have a choice. (Mr. Green, personal interview, September 30, 2016)

I think because they live it, [the other physics teacher and I] came up with this because it seemed to be a relevant problem to them that we might actually be able to get some real measurement out... I guess just we liked the thought that maybe they could solve it in a way that maybe they’d come up with solutions or recommendations that would actually be used. And that’ll feel really empowering if that’s the case. (Mr. Green, personal interview, November 11, 2016)

Rather than focus on the ability to influence the direction of class in their reflections on these clips, many students indicated that what mattered more to their engagement—both
positively and negatively—was the ways in which Mr. Green did or did not acknowledge their feelings.

Yeah, I think that clip showed that, I guess, how empathetic Mr. G is because he was open to the fact that like he probably made a mistake on the video. So a thing like that gives students a chance to voice their reason for why they put the wrong answer, I guess. So, like, it makes it easier for people to raise their hands and explain themselves. (James, focus group interview, September 29, 2016)

Similarly, the students in a Week 3 focus group had a conversation about Mr. Green showing confidence in them:

Sophie: I kind of liked it because he was joking with us at the beginning. Which like, I like because it shows that he’s not—I don’t know, I hate it when teachers are like

(Sophie scrunches her face). . . .

Megan: [Mr. Green said he was] proud of us.

Sophie: Oh yeah, that was nice.

Maggie: It was like relieving.

Sophie: definitely when he told us that everybody had good grades, that definitely made me a lot more excited (Maggie laughs) I had a lot more energy.

Megan: I felt like it lifted up our confidence (Todd nods) (focus group interview, October 13, 2016).

Students in both focus groups from Week 6 commented on the inhibiting effects of Mr. Green ignoring the tension the day after the election:

Todd: I feel like Mr. G didn’t really take into account the election.

James: Yeah, he really didn’t. Todd: He kind of just put it aside.
Todd: [Mr. Green] probably [should have spent] like fifteen minutes, twenty minutes just to talk about the election.

James: But, I sort of feel like the day after the election, that isn’t a great place to start a new lab, because, again, people are going to be still sad and crying about the results, so people aren’t going to be as engaged or focused on what’s going on so I feel like that period should be used as a time for people to gather their feelings as opposed to start something new (focus group interview, November 10, 2016).

The other focus group from that week had a similar conversation:

Sophie: It could have been in a way helpful if maybe he had talked about [the election] a little bit. . . .

Sarah: You could tell even in class, when everyone walked in it was really quiet. And I mean, it’s always quiet, but it was more quiet than usual.

Megan: It was; I literally walked in and it was like silent, I was like (Megan hunches her posture downwards while eyes look up). Sarah: I was like this (Sarah puts hand on forehead with elbow on desk, and eyes are wide looking down)…. Sophie: I was in a bad mood (Sarah laughs).

Sarah: and then our pro-Trumps over there (Sarah hold up left hand pointing outwards while looking down) they were all like perky, so you knew they were pro-Trump and then everyone else was just like (Sarah puts hand back on forehead like before) we can’t do this right now.

Sophie: yeah, I was on the computer.

Sarah: And Mr. G didn’t really do anything about it at all (focus group interview, November 9, 2016).
Summary of Differences Between Teacher and Students’ Interpretations of Teacher Moves

In summary, there were a number of video clips of Mr. Green’s class to which multiple students and he had different responses. These responses indicated different perceptions about the way the teacher influenced student engagement in these situations. Four different patterns of class events and subsequent participant responses to those events emerged in the analyses of the data. *Going over students’ work* is a theme in which the teacher indicated that he believed he was facilitating student engagement by providing student-centered structure, and multiple students indicated that they perceived him as inhibiting their engagement by not exploring the fact that they felt understimulated or confused. *Pushing independence* is a theme in which the teacher indicated that he believed he was facilitating student engagement by providing opportunities for student autonomy, and multiple students indicated that they perceived him as inhibiting their engagement by not providing enough structure and then rejecting their attempts to understand more. *Inauthentic choice* is a theme in which the teacher indicated that he believed he was facilitating student engagement by providing students with opportunities to control tasks, and multiple students indicated that they perceived him as inhibiting their engagement by not genuinely being open to the students’ choices. *Now you see me, now you don’t* is a theme in which the teacher indicated that he believed he was facilitating student engagement by empowering student agency, and multiple students indicated that they perceived him as influencing their engagement more by connecting with or not attuning to them.

**Final Reflections on Teacher-Student Relationships**

In the final interviews I conducted with the participants, I asked each one a direct question about their perception about the quality of their personal relationship with the teacher (or with the students in the case of Mr. Green). Mr. Green responded, “this is honestly one of the
best classes as a group, that I’ve taught in a long time” (Mr. Green, personal interview, December 16, 2016), but otherwise, he did not directly answer the question. His response to the question about relationships with the students and follow up prompts was to describe his perception of the ways each student tended to engage as a student in class. For the students, two patterns emerged in the types of things they talked about when I asked them to describe their relationship with Mr. Green. They indicated that Mr. Green was approachable but not enthusiastic about what he was teaching.

**Student Perceptions of Relationship Quality with Mr. Green**

The first teacher-student relationship theme that emerged among student responses during the final, one-on-one interviews was the theme of approachability. Students indicated that they felt comfortable, relaxed, and able to ask questions or seek out help from Mr. Green. “I can just ask [Mr. Green questions] without feeling scared to or anything” (Jason, personal interview, December 5, 2016); “I mean, he’s approachable to talk to if I have a problem” (Sophie, personal interview, December 7, 2016); “He likes to make sure that he’s approachable, and he tries to do it at least… he does encourage students to go to him for extra help” (Maggie, personal interview, December 12, 2016).

The second teacher-student relationship theme that emerged among student responses during the final, one-on-one interviews was the theme of being unenthusiastic. Students indicated that they felt Mr. Green was not interested in the material he was teaching. “I feel like he gets bored. . . so we get even more bored, and it’s kind of just a really boring class” (Todd, personal interview, December 8, 2016);

To be honest, I think that Mr. G, he’s not really as enthusiastic and glow-y as some of the other teachers…. I mean, he’s obviously not as enthusiastic. I’ve never really heard him
or seen him do anything that shows that he’s very passionate about what he teaches.

(Eric, personal interview, December 7, 2016)

Summary of Findings

My research questions in this study have been as follows:

1. What are teacher and student perspectives on the process of student engagement in learning in the classroom, and how is evidence of that process related to evidence of teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those changes related to the quality of teacher-student relationships in the classroom?

With regard to teacher and student perspectives on the process of engagement, participants spent most of the weekly interview time discussing what engagement looked like and what the teacher did to facilitate or inhibit engagement. In terms of what engagement looked like, Mr. Green tended to note and describe behavior that was more action-oriented. He spoke about students’ attentiveness, critical thinking, collaboration, independence, and work production when describing their engagement. Students, on the other hand, used more attention-oriented language to describe their engagement. Based on the reports from students’ exit slips, they indicated that they felt more engaged than not over the course of the study. In terms of what makes engagement happen, the teacher moves discussed by the participants align with self-determination theory (Wellborn & Connell, 1991; Skinner et al., 2008). These six categories included three types of moves that facilitate engagement (autonomy support, structure, and involvement) and three types of moves that inhibit engagement (control, chaos/understimulation, and alienation). The specific subcategories of teacher moves that fell within each of these broader teacher move categories align with the theory of the self-determination literature. They also offer specific manifestations
of what these ideas looked like in the particular setting of Mr. Green’s class. From the perspectives of the participants, teacher-student relationships played a role in the process of engagement in Mr. Green’s class in the form of involvement and alienation moves. However, students commented on these moves the least of all types of teacher moves (approximately 14% of all conversational turns that students initiated on the teacher’s behavior). Specifically, students perceived Mr. Green as facilitating engagement when he empathized with them, connected with them, and expressed confidence in them; conversely, they perceived him as inhibiting engagement when he rejected them or failed to attune to them.

Rather than change-over-time patterns emerging during analysis of the data, patterns in the data emerged regarding differences between students’ perceptions of class events and differences between the teacher and multiple students’ perspectives about certain types of class events. Some students commented on certain categories of teacher moves above and beyond the class averages. When the teacher and students demonstrated differences in their perceptions of teacher moves, students made more comments on the quality of teacher-student relationships as an influencing factor. In two of the four types of classroom events that inspired teacher-student differences students also commented on non-optimal challenges in conjunction with breakdowns in teacher-student relationships. The teacher did not indicate that he perceived teacher-student relationships to be an influencing factor in any of these types of events.
CHAPTER 5

DISCUSSION

Introduction

The purpose of this study was to explore student and teacher perceptions of the process of engagement in learning with a particular eye to understanding more about the role that teacher-student relationships play in that process. My research questions were as follows:

1. What are teacher and student perspectives on the process of student engagement in learning in the classroom, and how is evidence of that process related to evidence of teacher-student relationship building?

2. How does student engagement change over time, and to what extent are those changes related to the quality of teacher-student relationships in the classroom?

Through my work in Mr. Green’s classroom, I have arrived at a number of suggestions for both teacher practice and future research. First, I will discuss the utility of the self-determination model itself. I conclude that the findings of this study support the self-determination model of student engagement. Also, I propose that current definitions of the teacher moves in this model may be too restrictive. Second, I consider how my findings on student differences may point to new directions for the practices of differentiation. I propose that the typologies of different student “motivational orientations” that I saw in Mr. Green’s class suggest that the effects of differentiation may be enhanced by considering how all typologies can be addressed explicitly. Finally, I explore how teacher-student relationships seemed to matter more when there were differences in how the teacher and students perceived the effects of the teacher’s behaviors on student engagement. I propose that struggles to maintain optimal challenges are bound up in
these moments and enhanced teacher-student relationships could have helped maintain these optimal challenges.

**Implications for Self-Determination Theory**

The findings of this study help to confirm self-determination theory as a model for understanding student and teacher perceptions of the teacher moves that influence student engagement. Most of Mr. Green and his students’ perceptions about how teacher moves influenced student engagement aligned with self-determination theory’s self-systems model for motivational development (SSMMD). All six categories of teacher moves referenced in the self-determination literature (i.e. autonomy support, structure, and involvement on the engagement-facilitative side, and control, chaos/understimulation, and alienation on the engagement-inhibitive side, see Appendix A) were represented by the comments of Mr. Green and his students. Of the 367 conversational turns from students about what influenced their engagement, only 35 or 9.5% of these conversational turns related to factors outside of the six categories of teacher moves identified in the self-determination literature. Furthermore, the findings from these 35 conversational turns still offer some theoretical support for self-determination as a model that explains contextual factors outside of the teacher that influence student engagement. The findings from the 332 conversational turns that were about teacher moves confirm the literature for the six main categories and suggest possible directions for better operationalization of the subcategories for the types of moves. I argue that each of these expansions is still fundamentally rooted in the original theoretical basis for the SSMMD (Connell & Wellborn, 1991), even if researchers have not always supported these more robust definitions with the choices they’ve made to operationalize and define the subcategories of specific teacher moves.
There were not a significant number of teacher moves reported in this study that fell into the “involvement” or “alienation” categories (to be discussed more below), however, there was substantial data that suggested more robust subcategory properties for the autonomy support, control, structure, and chaos/understimulation main categories. The nuances between properties in these categories illuminate some possible gaps to be explored in future research, especially in the categories reflecting engagement-inhibiting teacher moves.

**Outside Contextual Factors Findings and Self-Determination Theory**

The findings of this study included 35 conversational turns about factors that influenced engagement which were not teacher moves as defined by the SSMMD. I grouped these comments in a category labeled, *outside contextual factors*. The findings of the four subcategories within this category suggest that the self-determination model may be useful for explaining more than just teacher moves. The *peer support* and *peer inhibition* subcategories encompassed moments in which students indicated that they felt their engagement was affected by connection with (i.e., involvement) or guidance from (i.e., structure) their peers on the one hand or rejection (i.e., alienation) from their peers on the other. The *outside support* subcategory included comments from students that indicated extrinsic goals they wished to achieve. These comments hinted at pressures and supports that students bring with them into the classroom from family, friends, and communities outside of the teacher. The *outside inhibition* category included comments regarding the need for sleep and the depressing, gloomy weather. In some ways, this category reflects Maslow’s (1943) physiological level of needs. However, self-determination theory emerged out of a humanistic paradigm (McCally, 2010), so the comments in this category are not inherently contradictory to the model. Overall, these findings reaffirm the need to look more broadly than just teacher moves to understand the full complexities of the environmental
facilitators and inhibitors of student engagement, but they do not offer reasonable data to reject the utility of the self-determination model.

**Teacher Moves Findings and Self-Determination Theory**

My findings offer substantive support for all six categories of teacher moves defined in the literature. Table 5.1 summarizes the categories from the literature that were supported by my findings and the subcategories of teacher moves that Mr. Green and his students reported as influential to student engagement. These moves overlap substantially with the literature from self-determination researchers who have operationalized teacher moves that influence all three psychological needs (Connell & Wellborn, 1991; IRRE, 1998; Reeve et al., 1999; Skinner & Belmont, 1993; Skinner et al., 2008; also, see Appendix A for further detail).

Table 5.1

*Categories of Teacher Moves Found in Perceptions of Mr. Green and His Students*

### Engagement Facilitating Moves

<table>
<thead>
<tr>
<th>Autonomy Support</th>
<th>Structure</th>
<th>Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing options</td>
<td>Creating challenges</td>
<td>Empathizing</td>
</tr>
<tr>
<td>Allowing student</td>
<td>Providing guidance</td>
<td>Connecting</td>
</tr>
<tr>
<td>control</td>
<td>Offering feedback</td>
<td>Expressing</td>
</tr>
<tr>
<td>Adapting</td>
<td>Reducing pressure</td>
<td>confidence</td>
</tr>
<tr>
<td>Creating relevance</td>
<td>Eliciting</td>
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<tr>
<td></td>
<td>responsiveness</td>
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### Engagement Inhibiting Moves

<table>
<thead>
<tr>
<th>Control</th>
<th>Chaos/Understimulation</th>
<th>Alienation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking too much</td>
<td>Confusing</td>
<td>Failing to attune</td>
</tr>
<tr>
<td>Rescinding freedom</td>
<td>instructions</td>
<td>Rejecting</td>
</tr>
<tr>
<td>Overcomplicating</td>
<td>Creating too much challenge</td>
<td></td>
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<tr>
<td>Failing to create</td>
<td>Failing to provide clear</td>
<td></td>
</tr>
<tr>
<td>relevancy</td>
<td>Repeating</td>
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<tr>
<td></td>
<td>instructions</td>
<td></td>
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<tr>
<td></td>
<td>Failing to create</td>
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<tr>
<td></td>
<td>challenge</td>
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Findings for engagement-facilitative teacher moves. The overlaps between my findings and the literature were stronger in the engagement-facilitative categories. For example, in autonomy support moves, both the choice and relevancy concepts from the literature are represented in the findings, even though choice is parsed out into providing options and allowing student control. These subcategories specify nuances within choice that may be captured in more holistic items that students answer on self-report surveys, like the RAPS (IRRE, 1998). Within involvement moves, expressing confidence addresses the concept of the teacher caring about how students do (IRRE, 1998; Reeve et al., 1999; Skinner et al., 2008); connecting addresses the concept of the teacher enjoying being with students (Connell & Wellborn, 1991; IRRE, 1998; Skinner & Belmont, 1993); and empathizing addresses concepts of attunement, care, and acceptance from the literature (Reeve et al., 1999; Skinner & Belmont, 1993; Skinner et al., 2008).

Within structure moves there was evidence to both confirm the common self-determination literature and suggest future research to broaden the subcategories that are used to operationalize how students and teachers experience structure. The subcategories, creating challenges, reducing pressure, and eliciting responsiveness address the ideas of optimal challenge (Connell & Wellborn, 1991; Reeve et al., 1999) or reasonable expectations (IRRE, 1998) in the literature; providing guidance aligns with the concept of offering clear expectations and directions (Connell & Wellborn, 1991; IRRE, 1998; Skinner & Belmont, 1993; Skinner et al., 2008); and offering feedback aligns with the concept of offering performance-related feedback (Reeve et al., 1999; Skinner & Belmont, 1993; Skinner et al., 2008). However, my findings also suggest further subcategories for teacher structure moves based on the idea of optimal challenge. The subcategory of reducing pressure refers to ways that the teacher builds in
processes and opportunities to re-do work so that no challenge seemed too overwhelming.

Furthermore, the subcategory of eliciting responsiveness refers to ways that the teacher created activities for students to be actors in overcoming the challenge in the first place. While these concepts seem to fit within the theory of optimal challenge (Connell & Wellborn, 1991)—especially when optimal challenge is considered through a flow theory lens (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 1997; Shernoff et al., 2003; Shernoff et al., 2016)—self-determination researchers have yet to operationalized these ideas in the surveys they have used to conduct self-determination research (IRRE, 1998; Reeve et al., 1999; Skinner & Belmont, 1993; Skinner et al., 2008).

Findings for engagement-inhibitive teacher moves. The findings from the engagement-inhibitive teacher moves also align with the main categories from self-determination, but the literature on engagement-inhibiting teacher moves is much less robust to start with. My findings for alienation moves were limited. In this case, the rejecting subcategory support Skinner et al.’s (2008) definition, but the failing to attune subcategory is better captured in Ainsworth’s (1979) attachment literature. With regard to my findings for the control and chaos/understimulation categories, however, my findings included more opportunities to expand the subcategories of teacher moves as they are operationalized in the self-determination literature.

In addition to findings that were expected from the literature, the major addition that emerged in the data for control moves had to do with the teacher commanding class activities more than students felt was necessary. The subcategories of talking too much and overcomplicating both addressed this issue and are implied but not well distinguished in the current research techniques for studying control teacher moves (e.g., Jang et al., 2010; IRRE, 1998; Skinner et al., 2008). The concept of talking too much may be related to ideas about
teacher coercion from the self-determination literature, but it goes beyond the scope of coercion alone. In this case, students do not understand the purpose of sitting and listening longer if they see a way in which they could be participating more actively. Similarly, the overcomplicating category refers to students’ not seeing the point of doing an activity the way that a teacher directed them to do it if it can be done more efficiently. These are related subcategories, but not the same. In the case of overcomplicating, students recognized a purpose for the primary action of the teacher, but felt a restrictive edge to the form his directions took. For example, when Zach and James are discussing how they felt the shark tank activity in Week 5 was ineffective, they indicate that the teacher still had something valuable to share through the shark tank activity. They implicitly accepted the value of the science content of the activity, but they did not feel that the manner in which the teacher chose to present that content was relevant to the lesson. Many self-determination research studies have merely reverse-coded autonomy-support moves as a way of representing control moves (e.g., IRRE, 1998; Skinner et al., 2008) but these data support the notion that this approach to operationalizing control moves may be inadequate for capturing the full range of nuances in how students perceive and experience teacher control.

My data also indicate that there are under-explored nuances in how to operationalize chaos/understimulation teacher moves. The findings of this study point to weaknesses in current measurement instruments to capture the concept of optimal challenge that was articulated in the original theory of the SSMMD (Connell & Wellborn, 1991). Currently, the engagement-inhibitive moves that relate to competence that have been operationalized in research instruments fall largely towards measuring the “chaos” side of this concept (e.g., Jang et al., 2010; IRRE, 1998; Skinner et al., 2008). This characterization misses the “understimulation” aspect of engagement-inhibitive moves. Many of the recent self-determination studies of teacher moves
(e.g. Jang et al., 2010; IRRE, 1998; Skinner et al., 2008) measure competence-related teacher moves by focusing on whether or not teachers provide adequate guidance, expectations, and feedback. In other words, the subcategories that measure chaos/understimulation are simply reverse-coded items that were built to measure optimal structure moves; thus they end up reading more like examples of chaos than examples of understimulation. Wellborn and Connell (1991) stated that feeling a sense of competence is rooted in the ability to overcome a challenge successfully. Instructions and feedback are needed to take action and judge the successfulness of one’s actions, but if there is no optimal challenge, then there is nothing to overcome. The added nuances that my findings suggest to the subcategories of teacher moves within the category of chaos/understimulation are related to the idea that optimal challenge requires the provision of experiences which pique intellectual arousal. In this case, the subcategory of creating too much challenge falls at one end of the challenge spectrum, and the subcategories of repeating instructions and failing to challenge fall at the other end. These data also draw strongly on the ties between flow research (Csikszentmihalyi, 1990; Csikszentmihalyi et al., 1997; Shernoff et al, 2003; Shernoff et al., 2016) and self-determination research. My finding suggest that self-determination researchers might benefit from expanding the ways that they operationalize teacher moves with an eye towards flow theory. Modifying the subcategories for chaos/understimulation in this way would not only bring the original theory from Connell and Wellborn (1991) into sharper focus, but it would also build bridges between self-determination work and flow theory research.

**Implications for Differentiation**

The findings about the differences among students’ perceptions raise interesting questions for our current understanding of differentiation practices. In this study, some students
commented more on one category of teacher moves than the others. Another way of saying this is that some students seemed to attend more to teacher moves that addressed one psychological need more than the others. For example, the engagement-enhancing effects of Mr. Green’s autonomy-support moves seemed to matter more to Jason’s engagement than to Sophie’s. Jason commented more frequently than his peers on the ways Mr. Green supported student agency. This is reflected in Jason’s tendency to comment on things like the engagement-enhancing effects of Mr. Green’s leaving the students alone to collect data and work out problems. However, Sophie did not comment as much on those same teacher moves. She noted connection with others (or a lack thereof) more frequently than her peers. She commented on things like the teacher’s small attempts to use humor as a connecting strategy more than Jason or Zach did. This suggests that students might have what could be called “motivational orientations” in terms of which types of teacher moves the students perceive to be most influential to their engagement.

Even though this was a class that, overall, seemed to be more engaged than not, there were some indications that Mr. Green perceived the autonomy-oriented students as more engaged than the relatedness-oriented students. When Mr. Green discussed students who he felt should earn the honors distinction for the course, he consistently mentioned Jason and Zach. When he commented on students who were the most talented and capable, he mentioned Jason on multiple occasions. However, when Mr. Green’s students off-handily commented on which peers they saw as the smartest and who they turned to for help, James’s name came up more than any other. In the end, Jason and Zach were the only two students who earned the honors credit. To earn this credit, Mr. Green required the students to create an online portfolio in which they added additional reflections and outside science connections to the work they had already completed in class. One might argue that, based on the number of students who reported that
they turned to James for science homework help, he did just as much extra science work as Jason and Zach did to create their online portfolios. The process of spending time alone to create a personal portfolio, however, seems to speak more to the need for autonomy than for relatedness. Helping peers, on the other hand, would seem to address the need for relatedness more than autonomy. An interesting question these data raise is: to what extent would someone like James have engaged in the process of earning honors credit if he had an option to pursue it that aligned more with the motivational orientation of relatedness?

Currently, the literature on differentiation strategies aligns with self-determination theory, but it privileges the needs for autonomy and competence over the need for relatedness. One of the assumptions of differentiation is that all students have different entry points and different needs that must be addressed if they are all to grow and learn (Tomlinson, 2014; Wormeli, 2006). Differentiation is the process of providing alternatives during learning activities to meet students where they are and thus better empower their growth (Tomlinson, 2014). The literature on differentiation strategies tends to emphasize three different principles of how to differentiate: by readiness, by interest, or by learning preference (Tomlinson, 2014). Differentiating by readiness is a direct response to the need to adjust activities to find optimal levels of challenge for every student. When a teacher provides students with clear, doable challenges, these moves help engage students by supporting competence.

The interest and learning preferences strategies of differentiation both address the need for autonomy. Differentiating by interest involves offering students choices about the specific topics or resources that students pursue. Differentiating by learning preference involves offering choices to students for how they construct or present their learning so that they have the opportunity to pursue and develop their content knowledge using the skills that they find most
relevant to their interests and talents. By enacting teacher moves that offer these types of choices, teachers support student engagement by supporting autonomy. Students feel more in control of the direction of their learning, and they find more relevance and meaning between their personal interests and the work they are doing.

None of these strategies directly address the need for relatedness, but this need could be integrated into the current model of differentiation. In the opening to Wormeli’s (2006) book on differentiation strategies, he alluded to a possible entry point for considering relatedness within a differentiation paradigm. In his opener, he suggested that any time a teacher rephrases a question or provides additional examples, those are examples of differentiating. The implication here is that the teacher somehow figured out that the first question or example did not make sense to one or more of the students. How did that happen? Perhaps the teacher noticed a confused look on someone’s face, but to rephrase most effectively the teacher would likely need to ask the student some questions to ascertain what made sense already. This is a strategy called formative assessment. Wormeli advocated using formative assessment to develop clearer understandings of how to apply differentiation strategies. However, formative assessment could be designed to elicit (and affirm) knowledge about students’ feelings, unique perspectives, and thus empower the teacher to make more personalized expressions of confidence in individual students. This type of differentiation would seem to address the need for relatedness. For example, teachers could ask students to share personal experiences that relate to a concept they are learning. Teachers can ask follow up questions about students’ examples or remember and invoke these stories later in the year. They might even be able to find ways to harness these personal anecdotes and experiences as the bases for highlighting students as unique experts in the classroom. In this way, addressing the need for relatedness can be incorporated into formative
assessment strategies because, fundamentally, teacher involvement moves require listening to and caring about students’ perspectives. If teachers only use formative assessment to listen to students’ understandings or abilities without caring for the whole person, however, they may provide adequate formative assessment according to the literature but miss the relatedness mark.

**Implications for Teacher-Student Relationships and Engagement**

One limitation of this study is that this was, generally speaking, a pretty engaged class. This was a limitation in the sense that I was not able to observe and talk with the students about as wide a range of disengaged behaviors as I may have been able to in another setting. In 18 out of 19 class periods in which I collected exit slips from students, the students indicated that there were more examples of interesting/engaged than boring/not engaged moments in class. The teacher, as well, indicated on more than one occasion that this was one of the best classes he had taught in his 15 years of teaching at Wellborne. Additionally, the findings of this study indicate that the role of teacher-student relationships is not a substantial factor in the overall picture of how the teacher facilitated student engagement in learning. Of the 131 conversational turns from students about teacher moves Mr. Green used that facilitated their engagement, only 10 of those, or 8%, were explicitly about teacher-student relationships (as defined by involvement moves). Among the conversational turns from students about teacher moves they perceived as inhibiting their engagement, the students attributed 37 out of 207, or 18%, to breakdowns in teacher-student relationships (as defined by alienation moves). Neither the presence nor the absence of teacher moves that were oriented towards teacher-student relationships seemed to be a sizable factor, overall, to the students’ perceptions of how the teacher influenced their engagement in learning.
However, teacher-student relationships rose to the forefront in the students’ discussions when I looked in isolation at the incidents in which there were disagreements between how the teacher and students interpreted the effects of the teacher’s behaviors. The contexts may have been different (e.g., in one case, the teacher providing feedback on student work, in another, the teacher offering students choices in class), but the pattern that emerged in the students’ perspectives was a lamentation over the teacher failing to investigate their feelings or perspectives adequately before offering potential support. These findings suggest a potential overlap between self-determination theory and sociocultural theory.

Students’ Perspectives on Who Initiates the Engagement Process

In each of the incident categories in which there was substantive disagreement between teacher and students, students commented that they believed Mr. Green was not doing enough to understand their needs. In the case of *going over students’ work*, James suggested that Mr. Green should just ask the class if they needed help before providing it, implying that (a) he was bored by the unnecessary review of work, and (b) he believed that it was Mr. Green’s job to ask rather than the students’ job to initiate such a suggestion to the teacher. In *pushing independence*, Maggie and Todd commented that Mr. Green did not seem to understand their confusion; and in the other focus group from the same week, James indicated that Mr. Green misread the students’ silence as a sign of comprehension. Both of these comments indicate that the students perceived the onus of clarifying miscommunication to be on the shoulders of the teacher, and Mr. Green failed to flush out their confusions. In *now you see me, now you don’t* a number of students in both focus groups from week 6 indicated that there was awkward tension in the room the morning after the presidential election, and it was Mr. Green’s failure to investigate their feelings that negatively affected their engagement.
In addition to the students’ perceptions of the teacher failing to attune to their feelings and perspectives, the students also raised the role of teacher-student relationships by commenting on breakdowns in trust. In *inauthentic choice* students expressed feeling duped by the shark tank activity or having their “hard work” in the chapel project be “thrown away” by Mr. Green. In *going over students’ work* Todd indicated that he felt Mr. Green ignored student voices because it did not seem that he explicitly responded to the students’ surveys in which a number of them indicated discomfort with technology. Whether it was a breakdown in trust because Mr. Green misled or rejected the students’ efforts or it was failing to attune to the students perspectives, a number of different students spoke to feelings of alienation in response to these incidents.

**Mr. Green’s Perspective on Who Initiates the Engagement Process**

In the incident categories in which there was substantive disagreement between teacher and students, Mr. Green, on the other hand, indicated that he believed he was supporting student engagement by fostering agency and student-centeredness. In *going over students’ work* he said that he believed he was attending to the students’ needs by focusing on their work, not some hypothetical problem. In *pushing independence* Mr. Green indicted that he believed he was providing resources and coaching support so that students could be more independent. In *inauthentic choice* he said that he really would have been open to whatever choice the students would have made if only they had offered logical reasoning. In *now you see me, now you don’t* Mr. Green was focused on how he was allowing students to direct class or how he was offering them a project that allowed them to experience some real agency outside of the classroom. In none of these incidents did Mr. Green indicate that he was aware of his moves (or lack of moves) to explore or affirm students’ feelings and perspectives.

**Teacher and Student Perspectives on the Nature of Engagement**
The breakdowns in teacher-student communication and trust evidenced in the aforementioned incidents may be related to differences in how Mr. Green and the students tended to define engagement itself. When Mr. Green spoke about student engagement in his class, he highlighted initiative, curiosity, independence, and collaboration. Furthermore, his interactions with students indicated that he believes the onus is on the students to communicate with him when they are confused or frustrated. In the video clip from Week 5 referenced in the going over students’ work theme, Mr. Green said, “Have we lost our nice relationship with each other? Does anyone want to work with me a little bit?” (Week 5, Clip 2) when the students were silent after he asked them a question. This implies that he sees the communicative heart of relationship building as a two-way street in which students initiate and share their needs, confusions, or curiosities, and he responds to help. This is in sharp contrast to the students’ perceptions above that seem to put the burden of initiating communication on the teacher’s shoulders.

The students’ reflections on both the nature of their engagement and their relationships with Mr. Green paint a different story of how they believe student engagement should work. When describing their engagement and disengagement, students tended to use more attention-oriented rather than action-oriented language. When disengaged, these students do not act out—they zone out. On the flip side, when they are engaged, they are attentive and “tuned in.” This language indicates that the students view attention as more indicative of engagement than action. Initiative and independence, however, require more action and agency. Interestingly, when students directly reflected on their relationships with Mr. Green, they tended to agree that he was approachable. Thus, their lack of initiative in the moments in which communication broke down does not seem to be a result of students feeling like they could not talk to Mr. Green.
Rather than students’ feeling like they were unable to talk to Mr. Green, the students’ comments indicate that the kind of independence and initiative Mr. Green idealized were uncomfortable to them. In a comment from *pushing independence*, Maggie says that, “sometimes I guess that benefits us in a way that we’re kind of independent with how we learn, but I don’t always like to feel like I’m completely alone, like on my own” (FG, Week 7). Maggie seems to acknowledge and understand Mr. Green’s value for independence, but there is a fine line for her between independence and alienation. She also does not seem to feel empowered to share her feelings with Mr. Green directly. In a Week 1 video clip from *pushing independence*, Mr. Green had said that he was “tossing them off the diving board to try to swim” (Week 1, Clip 6) when working on a conversion problem; Maggie responded by asking Mr. Green if he had made any Ed Puzzle videos to help with this work. This seemed to be the type of initiative with which Maggie was comfortable: trying to work with Mr. Green’s resources but not sharing her feelings. Mr. Green indicated that he saw this as a sign that he had provided resources that encouraged Maggie’s independence, but in her reflections on that video clip Maggie indicated that she felt unheard by Mr. Green. She was still confused, but during class, she did not go further to express the depth of her confusion to him.

One implication of these findings is that the power differential inherent to teacher-student relationships may pose an engagement obstacle, especially when the teacher has not structured optimal challenges for students. Frymier and Houser (2000) state two characteristics that set teacher-student relationships apart from other adolescent relationships are that (a) there are time constraints on the relationship, and (b) there is a lack of equality between partners. The comments from students recounted above highlight this inequitable feeling. However, when students became most frustrated by the teacher’s failure to investigate their perspectives, they
were also expressing feelings of non-optimal challenge. In the incidents discussed above, the students also expressed feelings of boredom, confusion, or let down. Thus, the interplay of the teacher-student power differential and the teacher’s failure to explore the students’ perspectives blossoms into engagement inhibition when there is fertile ground of non-optimal challenge.

**Sociocultural Theory Shines a Light**

Sociocultural theory may not offer a theory for engagement, per se, but Vygotsky’s (1978) theory of learning may offer an explanation for the disengagement that students reported when there were breakdowns in teacher-student communication. Vygotsky’s refers to the zone of proximal development (ZPD) as the place where learning occurs. The ZPD is a cognitive space where two people negotiate a shared understanding of a task or problem at hand (Vygotsky, 1978). Thus, there is a relationship implied and a challenge to be overcome. The person who is more knowledgeable may have already developed a more organized understanding of the thing to be taught, but there is still a learning role played by the more knowledgeable other (Vygotsky, 1978; Yowell & Smylie, 1999). In the case of the more knowledgeable other, his learning role in the ZPD is to try to understand the pre-conceptions that exist in the student’s understanding. It is only once he is able to apprehend the perspective of the student that he can then adjust his communication to meet the student where she is and help build a bridge to mutual understanding. The student must also work towards understanding the more knowledgeable other’s more organized, conceptual understanding, but each one is learning: the student is learning about the teacher’s ideas, and the teacher is learning about the student’s perspective. This is how the challenge of learning is overcome.

Sociocultural theory does not offer a prescription to cure the communication breakdowns that seemed to inhibit engagement in Mr. Green’s class, but if we accept this theory of learning,
then we may be able to better diagnose part of the engagement problem. A more knowledgeable other must be interested in his student and curious about exploring, not merely responding to, the student’s perspective. It is not enough for the more knowledgeable person to be approachable in the zone of proximal development. It is not enough for the more knowledgeable person to offer freedom and choice in the zone of proximal development. It is not enough for the more knowledgeable person to offer a set of resources and tools and then step back from the zone of proximal development. As Yowell and Smylie (1999) said, “successfully scaffolded adult-adolescent interactions may actually involve two experts and two novices. Adolescents may be experts in the content and interpretation of their immediate social world, whereas the adult may be the novice in this arena. Conversely, adults may have expert knowledge about the long-term consequences of certain behaviors and the strategies necessary to promote positive outcomes, whereas adolescents may be novices” (p. 474). Essentially, when learning is occurring in the ZPD, it involves the teacher trying to understand the students’ confusion and the student trying to understand the teacher’s clarity. Furthermore, it involves the teacher trying to understand when and how the zone is deteriorating for the student. In other words, if there is no challenge (the student is bored) or if there is too much challenge (the student is overwhelmed) then the student has been pushed out of the ideal sweet spot where learning can occur (Vygotsky, 1978).

Mr. Green expressed an ideal vision of independence for his students, but, in a sociocultural model of learning, independence comes after the negotiation of understanding within the ZPD. A conclusion of this study is that when students felt like the challenge was non-optimal, and they felt like Mr. Green was not interested in learning about them, they lost interest in learning about his ideas. This does not imply that Mr. Green’s goals for student independence or initiative are problematic. Quite the contrary, when students feel like they understand how to
approach a problem, independence can be highly motivating. As Jason said, “I think it’s a lot more engaging for me [to do work on my own] because it’s not sort of just sitting there and listening to [Mr. Green] just try to give you information; you’re really doing it yourself and learning it yourself” (FG, Week 3). However, when students feel overwhelmed—when the challenge presented chaos—suddenly, a push toward independence began to feel more like alienation. Inversely, when students felt underwhelmed—when the challenge presented too little stimulation—added structure also began to feel like alienation.

These findings do not indicate a simple strategy for avoiding these moments of student disengagement. They do support a conclusion that teacher-student relationships seem to matter more when optimal challenge is not maintained. They also support Frymier and Houser’s (2000) conclusion that students experience feelings of inequality in the teacher-student relationship. Moreover, this inequality manifested itself in student reports of feeling uncomfortable with initiating communication to express their feelings to Mr. Green when optimal challenge was not being met. Thus, if engagement was the goal, the burden of responsibility may have been more on the shoulders of the teacher to explore students’ perspectives in moments of non-optimal challenge. Therefore, how can researchers help teachers to accurately recognize moments in which the student experience slips out of the zone of optimal challenge? How can we honor the goal of independence while simultaneously honoring the mutual interdependence and mutual learning that must happen between teacher and student when working through the challenges that embody the zone of proximal development? These questions speak to both awareness-raising and strategy development, both of which seem to be important components for future research.

Conclusion and Future Research
The findings of this study support the self-determination self-systems model of motivational development and raise interesting questions about how we might empower teachers to be more thoughtful in their attempts to facilitate student engagement. First, future self-determination research on student engagement should explore teacher moves more robustly, especially with regard to the maintenance of optimal challenge. This might help provide teachers with more thoughtful, concrete anecdotes on what does and does not work to facilitate student engagement. Second, it may help teachers who are already invested in working towards embedding differentiation practices in their classrooms to understand more about how students’ motivational orientations can be taken into account when shaping activities that appeal to different student needs.

Finally, when Mr. Green did not explore students’ feelings and perceptions in moments in which optimal challenge was not maintained, students chose to disengage. Further research is needed on the unique role that relatedness-oriented teacher moves play in turning the engagement tide when moments of confusion or boredom arise. Readjusting and negotiating the independence or structure needed to maintain optimal challenge may be aided by the use of involvement moves. Helping teachers to recognize these critical moments and then deploy just-in-time involvement moves to connect with, understand, and affirm students’ feelings and perceptions could help maximize student engagement.
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Appendix A: Needs Supportive and Inhibitive Teaching Moves Based on the Literature

**Needs-Supportive Teaching Moves Based on Literature**

<table>
<thead>
<tr>
<th>Source</th>
<th>Autonomy Support</th>
<th>Structure</th>
<th>Involvement</th>
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<tbody>
<tr>
<td>Connell &amp; Wellborn (1991)</td>
<td>-choice -connect S behavior to personal goals/values -“lets me do work according to my schedule” -“lets me make decisions about work” -“discuss decisions w/me”</td>
<td>-communicate clear expectations (“let me know rules”) -consistent consequences (“do what they say they’re going to do”) -optimal challenge (not expected to do something I can’t do) -positive competence feedback (“tell me they’re proud of what I’ve done”)</td>
<td>-dedication of psychological resources (e.g. time, interest) + positive affect -“T knows a lot about what happens to me in school” -“T spends time helping me do better” -“T seems to enjoy being with me”</td>
</tr>
<tr>
<td>RAPS (IRRE, 1998)</td>
<td>-T explains why Ss have to learn things -T talks about how schoolwork is related to Ss goals/interests -T listens when S speaks -T thinks what S says is important</td>
<td>-T is fair -T’s expectations are reasonable -T’s expectations of S in school are clear -Ts rules in the classroom are clear</td>
<td>-T has time for me -T likes to be with me -T cares about how S does in school</td>
</tr>
<tr>
<td>Jang, Reeve, &amp; Deci (2010)</td>
<td>-T provides interest, enjoyment, sense of challenge to Ss -T creates opportunities for S initiative -T language is informational, flexible, offers choices -T identifies value, meaning, use, benefit, importance of requests -listens carefully, openly, understandingly -T accepts negative</td>
<td>-communicate clear, well organized expectations -frame learning activities w/explicit directions &amp; guidance -clear, understandable, explicit directions -offer prgm of action to guide Ss activity -offers goals -offer constructive, informative, competence-relevant feedback on how Ss can gain control over valued outcomes</td>
<td>-T has time for me -T likes to be with me -T cares about how S does in school</td>
</tr>
<tr>
<td>Source</td>
<td>Description</td>
<td>Methodology</td>
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<tr>
<td>Reeve, Bolt, &amp; Cai (1999)</td>
<td>-offers choices</td>
<td>-optimal challenge</td>
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<tr>
<td></td>
<td>-shared decision making</td>
<td>-performance feedback</td>
<td></td>
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<tr>
<td></td>
<td>-student-centered</td>
<td>[-provide rationale]</td>
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<tr>
<td></td>
<td>-encouraging initiative</td>
<td>[-nurture competence]</td>
<td></td>
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<tr>
<td></td>
<td>-non-controlling communication style</td>
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<tr>
<td></td>
<td>-promote value of task</td>
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<td>Skinner &amp; Belmont (1993)</td>
<td>-freedom for S to determine own behavior</td>
<td>-info about how to effectively achieve desired outcomes</td>
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<tr>
<td></td>
<td>-coercion (reverse)</td>
<td>-clear communication of expectations</td>
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<td></td>
<td>-respect (acknowledging importance of Ss opinions, feelings, agendas)</td>
<td>-contingency (consistency &amp; predictability of response)</td>
<td></td>
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<tr>
<td></td>
<td>-choice</td>
<td>-offering instrumental support</td>
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<tr>
<td></td>
<td>-relevance</td>
<td>-adjusting T strategies to the level of the S</td>
<td></td>
</tr>
<tr>
<td>Skinner, Furrer, Marchand, &amp; Kindermann (2008)</td>
<td>Relevance, S choice, respect</td>
<td>-caring, supportive alliances</td>
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<tr>
<td></td>
<td></td>
<td>-pedagogical caring (Wentzel, 1997; Noddings, 1984)</td>
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<tr>
<td>Anderson, Christenson, Sinclair &amp; Lehr (2004)</td>
<td></td>
<td>-care for S</td>
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<td></td>
<td></td>
<td>-valuing S</td>
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<tr>
<td></td>
<td></td>
<td>-S comfortable communicating w/T</td>
<td></td>
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<tr>
<td>Finn &amp; Voelkl (1993)</td>
<td></td>
<td>-T welcomes/supports Ss</td>
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<td></td>
<td></td>
<td>-T &amp; S get along</td>
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<tr>
<td></td>
<td></td>
<td>-T interested in Ss</td>
<td></td>
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<td></td>
<td></td>
<td>-T praises Ss efforts</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>-T listens to S</td>
<td></td>
</tr>
<tr>
<td>Noddings (1984, 2005)</td>
<td></td>
<td>-engrossment: attention, listen to</td>
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<tr>
<td>Source</td>
<td>Control</td>
<td>Chaos/Understimulation</td>
<td>Alienation</td>
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<tr>
<td>Ainsworth (1979)</td>
<td>discern needs of Ss, receptivity to Ss perspective and situation -motivational displacement: give primacy to goals and needs of Ss</td>
<td>-accessible to S -sensitive to Ss signals/needs -responsive to S</td>
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**Needs-Inhibitive Teaching Moves Based on Literature**

<table>
<thead>
<tr>
<th>Source</th>
<th>Control</th>
<th>Chaos/Understimulation</th>
<th>Alienation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connell &amp; Wellborn (1991)</td>
<td>-S confused about T expectations -unpredictable consequences</td>
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<td>RAPS (IRRE, 1998)</td>
<td>-T doesn’t give reasons why we do things -T doesn’t connect material to Ss lives -T interrupts S -T controls Ss behavior</td>
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<tr>
<td>Reeve, Bolt, &amp; Cai (1999)</td>
<td>-T not fair -T expectations off base -T expectations not clear -T likes other Ss better -T doesn’t have time for S</td>
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<tr>
<td>Jang, Reeve, &amp; Deci (2010)</td>
<td>-Ts directions are absent, confusing, poorly organized; there’s no clear frame for the lesson -T offers little or no guidance or leadership -T offers no action plan or goal -T doesn’t offer hints to help Ss take control of activity</td>
<td></td>
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<tr>
<td>Study</td>
<td>Coercion</td>
<td>Chaos</td>
<td>Rejection</td>
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<td>-------------------------------</td>
<td>--------------------------------------------------------------------------</td>
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<tr>
<td>Furrer &amp; Skinner (2003)</td>
<td>-T blocks or counters S expressions of negative affect (it’s not ok, something to be fixed)</td>
<td>-T doesn’t offer feedback or it’s rambling, irrelevant, or off-task</td>
<td>[based on instrument] -feels ignored -feels unimportant</td>
</tr>
<tr>
<td>Skinner, Furrer, Marchand, &amp; Kindermann (2008)</td>
<td>&quot;Coercion&quot; -T is controlling -“T is always telling me what to do”</td>
<td>&quot;Chaos&quot; -“T doesn’t make clear what she expects from me”</td>
<td>&quot;Rejection&quot; -T demonstrates hostility or neglect “my T doesn’t enjoy having me in class”</td>
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<tr>
<td>Finn &amp; Voelkl (1993)</td>
<td></td>
<td>-T puts down Ss</td>
<td></td>
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<tr>
<td>Ainsworth (1979)</td>
<td></td>
<td>-T disregards S signals/needs -T is belated in responding to S needs -T responds inconsistently or inconsistently to S needs -T rejects S -T averse to spending time with S -T doesn’t display positive affect to S</td>
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### Appendix B: Focus Group Data: Participants, Length, and Clips

<table>
<thead>
<tr>
<th>FG1</th>
<th>Group 1</th>
<th>Group 2</th>
<th>JL</th>
<th>Clip 1</th>
<th>Clip 2</th>
<th>Clip 3</th>
<th>Clip 4</th>
<th>Clip 5</th>
<th>Clip 6</th>
<th>Clip 7</th>
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<td>12:36</td>
<td>(9/29)</td>
<td>(9/30)</td>
<td>9/30</td>
<td>Friday, September 16th Beginning of Unit Conversions Lab</td>
<td>Friday, September 16th Beginning of Unit Conversions Lab</td>
<td>Tuesday, September 20th Unit Conversions Lab Continued—Ed Puzzle HW</td>
<td>Tuesday, September 20th Unit Conversions Lab Continued—Powers of 10 Video</td>
<td>Thursday, September 22nd Unit Conversions Lab Cont. Again—Predicting Other People’s Measurements</td>
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<td></td>
<td>Ellen, Sarah, James, Zach</td>
<td>Todd, Cody, Maggie</td>
<td>49:40</td>
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<td>49:40</td>
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<td>Monday, September 26th, Beginning of Hanging Unit Objects</td>
<td>Monday, September 26th—Hanging Unit Objects</td>
<td>Wednesday, September 28th—Intro to Triangulation Lab</td>
<td>Wednesday, September 28th—Occultation at the Sundial</td>
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<td>Monday, September 26th, Beginning of Hanging Unit Objects</td>
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<td>Wednesday, September 28th—Intro to Triangulation Lab</td>
<td>Wednesday, September 28th—Occultation at the Sundial</td>
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<td>9:23</td>
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<td>Tuesday, October 4th Line of Sight Data Collection</td>
<td>Thursday, October 6th Practice Problems for Sig Figs</td>
<td>Thursday, October 6th Going Over Ed Puzzle in Sig Figs</td>
<td>Monday, October 10th Class Before the Test (Beginning)</td>
<td>Monday, October 10th Class Before the Test (Review Sig Figs, Magnet Video)</td>
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<td>12:00</td>
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<td>(10/30)</td>
<td>10/27</td>
<td>Friday, October 14th Intro to Pi Lab: Brainstorming Knowledge about Circles</td>
<td>Friday, October 14th Intro to Pi Lab: Explaining Pi Lab</td>
<td>Friday, October 14th Intro to Pi Lab: Setting up Mathematica</td>
<td>Tuesday, October 18th Day 2 of Pi Lab: Video Feedback Explained</td>
<td>Tuesday, October 18th Day 2 of Pi Lab: Oilers Disc</td>
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<td>FG5</td>
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<td>Wednesday, October 26th First Day Back from Fall Family Weekend: Kahoot</td>
<td>Wednesday, October 26th First Day Back from Fall Family Wknd: Practicing Writing Abstracts</td>
<td>Tuesday, November 1st Venus Orbit Problem Part 1</td>
<td>Tuesday, November 1st How Many Hummingbird Flaps Problem</td>
<td>Tuesday, November 1st Brainstorming Problems in Frequency Lab</td>
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<td>(11/10)</td>
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<td>Thursday November 3rd Collecting Data for the Shark Tank</td>
<td>Thursday November 3rd Reporting Out at the Shark Tank</td>
<td>Monday November 7th Kahoot</td>
<td>Monday November 7th Traffic Problem Video</td>
<td>Wednesday November 9th Sending Email to Mr. F and Planning</td>
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<td>10:12</td>
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<td>FG7</td>
<td>(11/17)</td>
<td>(11/17)</td>
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<td>12:00</td>
<td>Zach, James, Eric, Megan</td>
<td>Todd, Maggie, Sophie, Ellen a little over 52:00</td>
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<td>53:07</td>
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<td>November 11th Discussion of Pendulum Lab Before Starting Traffic Problem</td>
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<td>52:54</td>
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<td>November 15th Beginning of 2nd Class Working on the Chapel Traffic Problem</td>
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<td>52:00</td>
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<td>November 15th Making the Outline for the Chapel</td>
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<td>53:07</td>
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<td>November 15th Transition from Mr. G facilitating to Class Working on Chapel Traffic Project</td>
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<td>53:07</td>
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<td>November 15th Mr. G out of the room, Sarah and Maggie Talking about Slide Plans</td>
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<td>53:07</td>
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<td>November 15th First Practice Run of the Chapel Traffic Slideshow</td>
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<td>53:07</td>
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<td>November 17th Presenting Chapel Traffic Project to Mr. F</td>
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Notes:
1. There is representation from every class of the fall term except the first three class periods of the year (9/8, 9/12, & 9/14), the day that the students had a test (10/12), and the day I missed class (10/28).
2. My video camera equipment faltered and I missed recording portions of FG5 with Mr. Green and FG7 with group 2. For FG5 with Mr. Green, I reconstructed as much of his responses as I could from memory and emailed him that same day to member check what I had written. With FG7 group 2, I missed approximately five minutes of the interview and was unable to reconstruct the missed portion.
Appendix C: Concluding Student Semi-Structured Interview Protocol

1. How would you describe the relationship between you and your science teacher? How do you think this relationship has changed over the past 7 to 10 weeks?

2. What incidents or examples come to mind when you think about significant moments that have shaped the quality of the relationships between you, your classmates, and your science teacher over the past 7 weeks?

3. How do the things your science teacher says and does make you feel about being interested in your science class? Can you provide some specific examples?

4. How would you say that you act in your science class in comparison to how you act in other classes? What makes your participation in science class different?

5. How interested are you in your science class now? Can you share any examples of experiences that have increased or decreased your interest in this class over the past 7 to 10 weeks?
Appendix D: Initial Teacher Semi-Structured Interview Protocol

1. Please tell me a little bit about your goals for your freshman science classes.

2. When you sit down to lesson plan, what do you take into consideration and weigh when making choices about how to structure lessons?

3. Please tell me about a student who was really engaged in your freshman science class in the past. How did you know that they were really engaged?

4. Please tell me about a student who maybe was not very engaged at first in your freshman class but who became more engaged with your help. How did that work?

5. Please tell me about a student who you think never was able to engage well in your class. How did you respond to that student?

6. How would you describe your approach to motivating students to participate in class? Can you give any examples of things you do?
Appendix E: Concluding Teacher Semi-Structured Interview Protocol

1. How would you describe the relationship between you and the students in this class?

2. What incidents or examples come to mind when you think about significant exchanges that have shaped the quality of your relationships with these students over the past 7 to 10 weeks?

3. How would you describe the engagement of the students in this class? How do you think their levels of engagement have changed, if at all, over the past 7 to 10 weeks?
### Appendix F: Occurrences of Student Comments on Helps and Hindrances to Engagement

<table>
<thead>
<tr>
<th>Week. Video Clip</th>
<th>Involvement</th>
<th>Alienation</th>
<th>Structure</th>
<th>C/U</th>
<th>Aut Sup</th>
<th>Control</th>
<th>Other</th>
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<td>Cody</td>
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<td>(Ellen)</td>
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**NOTES:** Names in parentheses refer to a student who indicated agreement with the student who initiated the conversational turn. Names in brackets refer to a student who commented on helps or hindrances to their engagement in Mr. Green’s class that did not occur directly in the video clip provided as fodder.
## Appendix G: Student Engagement By Video Clip

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208
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