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USING CLASSROOM SOCIAL DYNAMICS TO UNDERSTAND CLASSROOM ADJUSTMENT BY STUDENTS WITH DISABILITIES

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USING CLASSROOM SOCIAL DYNAMICS TO UNDERSTAND CLASSROOM ADJUSTMENT BY STUDENTS WITH DISABILITIES

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

by

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Dedication

This dissertation is dedicated to my teachers and the practice of teaching.

The Guru is Brahma; the Guru is Vishnu, the Guru Deva is Maheswara (Shiva),

The Guru is Verily the Para-Brahman (Supreme Brahman); Salutations to that Guru.
Table of Contents

List of Tables ....................................................................................................................... ix
List of Figures ....................................................................................................................... x
Abstract ................................................................................................................................. xi

I. INTRODUCTION ........................................................................................................... 1
   Overview of Constructs ....................................................................................................... 2
      Classroom Social Dynamics ............................................................................................. 3
      Peer Assessment of Behavior ......................................................................................... 4
      Preference ......................................................................................................................... 5
      Popularity ......................................................................................................................... 5
      Peer Group Membership ................................................................................................. 5
      Social Network Centrality ............................................................................................... 6
      Norm Salience .................................................................................................................. 6
      Peer Victimization Subtypes ............................................................................................ 7
      Perception of Bullying Ecology ....................................................................................... 7
      School Belonging .............................................................................................................. 8
   Rationale for Study of Problem ......................................................................................... 8
   Statement of Purpose ......................................................................................................... 8
   Research Questions ........................................................................................................... 9
II. REVIEW OF LITERATURE .........................................................................................................................10

Classroom Social Dynamics .......................................................................................................................11

Measures of Peer Relations and Social Dynamics .......................................................................................12

Peer Assessment of Social Behavior ...........................................................................................................13

Preference and Sociometric Status .............................................................................................................13

Popularity .........................................................................................................................................................15

Peer Group Membership ...............................................................................................................................16

Social Network Centrality .............................................................................................................................17

Bullying Involvement Subtypes .....................................................................................................................17

School Belonging ...........................................................................................................................................18

Perception of Bullying Ecology ...................................................................................................................19

The Classroom as a Society ...........................................................................................................................19

Norm Salience ................................................................................................................................................20

The Social Relations of Students with Disabilities ......................................................................................22

Peer Assessment of Social Behavior ...........................................................................................................23

Preference and Sociometric Status ..............................................................................................................25

Popularity .......................................................................................................................................................28

Peer Group Membership .............................................................................................................................29

Social Network Centrality ............................................................................................................................30

Bullying Involvement Subtypes .....................................................................................................................32

Summary of the Social Relations of Students with Disabilities ...................................................................34

Students with Disabilities at Risk for Bullying Involvement ....................................................................35

Research Needs and Implications for the Current Study ...........................................................................37
III. METHODOLOGY ................................................................................................................. 39

The Research Problem ............................................................................................................. 39
Study Design ............................................................................................................................... 40
Student Participants .................................................................................................................. 40
Procedure ..................................................................................................................................... 42

Measures ..................................................................................................................................... 42

Peer Behavior Assessment ........................................................................................................ 43
Social Cognitive Mapping .......................................................................................................... 44
Bullying Involvement Subtype .................................................................................................... 46
Peer Perception of Bullying ....................................................................................................... 46
School Belonging ....................................................................................................................... 47

Final Sample .............................................................................................................................. 47

Analytical Plan .......................................................................................................................... 48

Research Question 1 ................................................................................................................. 48
Research Question 2 ................................................................................................................. 49
Research Question 3 ................................................................................................................. 51
Research Question 4 ................................................................................................................. 51

IV. RESULTS ............................................................................................................................. 52

Research Question 1 ................................................................................................................. 53
Research Question 2 ................................................................................................................. 55

Social Roles and Reputation .................................................................................................... 56
Social Network Centrality .......................................................................................................... 60

Research Question 3 ................................................................................................................. 66
Research Question 4 ........................................................................................................... 70

V. DISCUSSION .................................................................................................................. 74

Class Type Based on Norm Salience ................................................................................. 76
Social Roles and Reputation ............................................................................................... 80
Social Network Centrality and Bullying Involvement ......................................................... 83
School Belonging ................................................................................................................. 86

Limitations ............................................................................................................................ 88
Sample ..................................................................................................................................., 88
Measure ................................................................................................................................. 88
Design ................................................................................................................................., 89
Analytical Approach ............................................................................................................. 89

Implications for Research and Practice .............................................................................. 90
Conclusion .............................................................................................................................. 92

REFERENCES ..................................................................................................................... 94

APPENDICES ...................................................................................................................... 107

Appendix A: Peer Nominations of Behavior .................................................................... 107
Appendix B: Social Cognitive Maps ..................................................................................... 109
Appendix C: School Belonging Scale .................................................................................. 110
Appendix D: Peer Perception of Bullying Ecology ............................................................... 111
Appendix E: Review of Literature Tables ............................................................................ 113
Appendix F: Descriptive Statistics Tables ........................................................................... 118
List of Tables

Table 1 Model Fit Indices for Latent Profile Analyses Specifying One to Six Latent Classes.....54
Table 2 Hierarchical Linear Modeling Parameter Estimates for Peer-Nominated Roles and Reputations.................................................................................................................................................................59
Table 3 Hierarchical Generalized Modeling Parameter Estimates for Social Network Centrality ..................................................................................................................................................................................................65
Table 4 Hierarchical Generalized Modeling Parameter Estimates for Bullying Involvement Subtypes.......................................................................................................................................................................................................69
Table 5 Hierarchical Linear Modeling Parameter Estimates for School Belonging and Perception of Peer Ecology........................................................................................................................................................................................72
Table A1 Studies Using Peer Assessment of Social Behavior of Students with Disabilities..... 113
Table A2 Studies Evaluating Sociometric Status of Students with Disabilities......................114
Table A3 Studies on Popularity of Students with Disabilities.......................................................115
Table A4 Studies on Peer Group Membership of Students with Disabilities.................................116
Table A5 Studies on the Social Network Placement of Students with Disabilities....................117
Table A6 Results of t-Test and Descriptive Statistics ................................................................118
List of Figures

Figure 1 Comparing students with disabilities to their non-disabled peers on *gets their way* by classroom norm salience type .................................................................60

Figure 2 Comparing students with disabilities to their non-disabled peers on *leader* by classroom norm salience type .................................................................60

Figure 3 Comparing students with disabilities to their non-disabled peers on *school belonging* by classroom norm salience type .................................................................73
Abstract

USING CLASSROOM SOCIAL DYNAMICS TO UNDERSTAND CLASSROOM ADJUSTMENT BY STUDENTS WITH DISABILITIES

By Meera Ruchik Mehtaji, PhD

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

Virginia Commonwealth University, 2017

Director: Thomas Farmer, PhD

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This study aimed to understand constructs related to classroom social dynamics in a sample (n = 1863) of rural middle school students. First, it used latent profile analysis to classify classrooms based on classroom norm salience. Next, the study used the Hierarchical Linear
Model to study the influence of classroom norm salience on the social roles and reputations, social network centrality, bullying involvement, and school belonging of students with disabilities. There were four major findings. First, classrooms were classified into two distinct categories based on students’ social reputations, which were positively associated with peer-nominated popularity: High Aggression Norm Salience Classrooms and High Academic/Prosocial Norm Salience Classrooms. Second, there were significant differences by class type in two specific social characteristics: students with disabilities were more likely to get their way and be nominated as leaders in classrooms classified as High Aggression Norm Salience Classrooms. Third, there was no difference in either social network centrality or bullying involvement of students with disabilities by class type. Fourth, students with disabilities were more likely to feel school belonging in classrooms that were identified as High Academic/Prosocial Norm Salience Classrooms. The implications for practice and policy are discussed.
Chapter 1

Introduction

Over ninety-five percent of students with disabilities spend a portion of their day in inclusive settings; 60% of these students are in general education classrooms most of the time (i.e., 80% or more of the day) (U.S. Department of Education, 2015). Therefore, most students with disabilities have a considerable amount of social contact with nondisabled peers during the school day. However, students with disabilities not only often experience academic difficulties in school but also often have difficulty navigating social situations (Evans & Eder, 1993; Meadan & Monda-Amaya, 2008; Nowicki, 2003; Siperstein, Parker, Bardon, & Widaman, 2007) more specifically, compared to their nondisabled peers, students with disabilities are less likely to be socially accepted by their classmates (Frederickson & Furnham, 2004), more likely to face social isolation and to affiliate with marginalized peers (Pearl et al., 1998), and at greater risk of being involved in peer victimization and bullying relations (Blake, Lund, Zhou, Kwok, & Benz, 2012; Chen, Hamm, Farmer, Lambert, & Mehtaji, 2015; Rose, Espelage, & Monda-Amaya, 2009).

To remedy these problems, professionals in the field have focused on social skills training as a way to help students with disabilities learn to more effectively navigate social situations (Gresham, Sugai, & Horner, 2001; Maag, 2006; Plavnick, Kaid, & MacFarland, 2015).
Although such efforts are necessary and have shown promise for improving the peer experiences of students with disabilities (as represented in the above studies), other factors also need to be considered. In particular, there is a need to clarify how the peer ecology and natural social dynamics of the classroom contribute to the social relations and experiences of students with disabilities (Farmer, Lane, Lee, Hamm, & Lambert, 2012; Siperstein & Parker, 2008). This includes understanding how students form peer groups and develop their identity within the peer culture (Adler & Adler, 1998; Corsaro & Eder, 1990; Eder, Evans, & Parker, 1995). In inclusive settings, the norms that govern the collective behavior of students may contribute to or protect students with disabilities against peer victimization (Hamm, Schmid, Farmer, & Locke, 2011; Lapinski & Rimal, 2005; Rodkin, 2011). The objective of this study was to bring together the concepts of classroom social dynamics and norm salience and use them as a lens to understand the classroom as a society and better comprehend its contribution to the social adjustment and bullying involvement of students with disabilities.

**Overview of Constructs**

*Social dynamics* refers to the way interpersonal contexts are organized or structured and to how this organization impacts and is impacted by the interactions of individuals within the relevant ecologies (Farmer, 2000). To help us understand this process and contextualize it within the notion of classroom ecology, this section discusses key constructs related to social dynamics. Next, the chapter will discuss the concept of norm salience, which governs social dynamics, and its influence on peer ecology. The discussion ends with a brief description of bullying involvement subtypes and peer perceptions of bullying ecology.
Classroom Social Dynamics

Ahn and Rodkin (2014) described the classroom as a society in which students “interact with, influence, and socialize one another” (p. 2). This process of interpersonal interaction, influence, and socialization is dynamic and bi-directional within the classroom ecology, forming what is referred to as classroom social dynamics (Farmer, 2007). Social dynamics research indicates that students generally affiliate with peers who share similar characteristics or those who complement them (Adler & Adler, 1995; Evans & Eder, 1993). Individual students develop patterns of behavior that support peer affiliations and reinforce certain behavior patterns, thereby creating social synchrony (Adler & Adler, 1995; Ahn & Rodkin, 2014; Cairns & Cairns, 1994). Additionally, students leverage social influence to develop and maintain social hierarchies (Adler & Adler, 1995; Ahn & Rodkin, 2014; Rodkin, 2011; Pellegrini, 2002).

Homophily is one of the ways students organize themselves. Students tend to interact and befriend peers that share similar demographic, social, behavioral, and interpersonal characteristics (Adler & Adler, 1995; Evans & Eder, 1993; Farmer & Farmer, 1996) thus, their peer groups are more likely to be homogeneous (McPherson, Smith-Lovin, & Cook, 2001). Furthermore, to help themselves maintain a place in these social structures, students develop individual patterns of behavior that support and reinforce certain peer affiliations and group-level behavior patterns, leading to social synchrony (Adler & Adler, 1995; Ahn & Rodkin, 2014; Farmer & Farmer, 1996).

There are three types of social exchanges: (a) imitation, where the student models peer behavior; (b) reciprocity, in which the individual responds to peers in a similar manner as they respond to him or her; and (c) complementarity, in which two peers have unequal status or abilities but one’s behavior or role is required for the viability of the other’s behavior or role.
(Cairns & Cairns, 1994; Farmer & Farmer, 1996). In the process of synchronizing social behavior patterns, students organize themselves within a *hierarchical social structure* where they leverage social influence to develop and maintain distinct positions (Adler & Adler, 1995; Ahn & Rodkin, 2014; Pellegrini, 2002; Rodkin, 2011). Such social hierarchies are organized based on three distinct criteria: (a) distinct affiliations to particular peer groups; (b) social roles/status, measured sociometrically, and social network centrality, and (c) reputations, which are reports of peer-nominated social and behavioral characteristics, including popularity and involvement in bullying. Over the years, the construct of social dynamics has been measured through peer assessment of behavior, preference, popularity, peer group membership, and social network centrality (e.g., Farmer & Rodkin, 1996; Farmer, Stuart, Lorch, & Fields, 1993; Rodkin, Farmer, Pearl, & Van Acker, 2000). Other studies (e.g., Dijkstra & Gest, 2015) have looked at norm salience, bullying involvement subtype, and peer perception of bullying ecology as other dimensions of classrooms social dynamics. Each of these measurement constructs and the understanding of the involvement of students in bullying in the classroom that they yield is valuable to understand involvement in bullying among students with disabilities.

**Peer Assessment of Behavior.** Peer assessment of behavior is a peer nomination measure that allows participants to designate peers who best fit criteria for distinct behavior characteristics (Farmer et al., 1993). This measure is an indicator of students’ perception of their classmates, and it includes information that adults in the classroom are not privy to (Coie, Dodge, & Kupersmidt, 1990). In a social dynamics perspective, students affiliate with peers who share similar behavioral characteristics (e.g., students identified as being aggressive affiliate with aggressive peers; Farmer & Farmer, 1996). Further, students’ risk for involvement in bullying relations depends on their behavioral characteristics.
Preference. Sociometric status questions asking participants to nominate peers they “like most” and those they “like least” are used to measure preference. “Accepted” is the total number of “like most,” while “rejected” is the total number of “like least.” Preference scores are obtained by subtracting the sum of “rejected” from the sum of “accepted,” while the “social impact” score is the sum of accepted and rejected scores (Cillessen & Marks, 2011). Thus, preference is an indicator of whether the student is liked or disliked by their peers.

Popularity. Popularity is another dimension of social status; researchers have aimed to differentiate between “likeability” and “popularity” (Parkhurst & Hopmeyer, 1998). Peer nomination measures ask participants to nominate those students they perceive to be popular. Popularity indicates social dominance and social prominence (Rodkin et al., 2000) and is distinct from acceptance (traditionally termed sociometric popularity in the research literature) which indicates how well liked students are (Parkhurst & Hopmeyer, 1998; Cillessen & Rose, 2005; Cillessen & Marks, 2011). Studies have indicated that students who are popular do not always exhibit prosocial qualities, and often use aggressive strategies to maintain their position within the social hierarchy (Adler & Adler, 1993; Rodkin et al., 2006).

It is important to note that Cillessen and Marks (2011) recommended a change in terminology in this regard. In past, studies have often referred to what is called “sociometric popularity” above as “preference”/“peer preference,” while within the research literature, what we call “popularity” has often been labeled “perceived popularity” or “social prominence.” This study uses popularity and preference as its basic terms, as per recommendations by Cillessen and Marks (2011).

Peer Group Membership. Peer group membership is assessed using the social cognitive mapping (SCM) procedure (Cairns & Cairns, 1994) in which students are asked to identify peers
“that hang around together a lot.” This information is aggregated to create a map of the classroom and identifies whether students exist within peer groups or not (i.e., isolates). Peer group membership assesses social units that consist of more than two individuals (Kindermann & Gest, 2009). Knowledge of individual students’ group membership provides insight into their social relations. Composite knowledge of peer affiliates also sheds light of the nature of the peer behaviors associated with the group, and it is possible to chart the behavior characteristics of peer groups by the nature of their association. Estell and his team (2009) found that bullying was associated with peer-nominated aggression; thus, they could identify patterns of behaviors within groups based on peer group membership.

**Social Network Centrality.** Social network centrality assessments also use the social cognitive mapping procedure (Cairns & Cairns, 1994) to identify the individual position of each student within their peer group as well as the position of each of the peer groups (e.g., Farmer & Rodkin, 1996). Students are identified as being nuclear, secondary, peripheral, or isolates in relation to a peer cluster (and in the case of isolates, the broader network). Nuclear members are those who receive relatively more nominations placing them within a peer cluster than other members of the group. Secondary members receive an average number of nominations for the peer cluster. Peripheral members are the outermost members of a group; they receive few nominations for the group. Isolates are those students who are not nominated into any peer groups (Farmer, Van Acker, Pearl, & Rodkin, 1999). Network centrality thus helps assess the social standing of an individual student both within their respective group and within the broader peer network.

**Norm Salience.** Norms are social phenomena that influence group members (Lapinski & Rimal, 2005). Researchers aimed to deconstruct the influence of norms on classroom social
dynamics by differentiating between descriptive norms and injunctive norms (Lapinski & Rimal, 2005; Hamm, Schmid et al., 2011). Descriptive norms measure values and behaviors that are characteristic of the group (Hamm, Schmid, et al., 2011), while injunctive norms are perceptions of behaviors and values that group members expect will be maintained by members (Hamm, Schmid, et al., 2011). Taking the concept of norms a step further, norm salience describes the correlation between classroom-level norms and status, which influences classroom social dynamics (that is, behaviors displayed by high-status peers are more influential; Dijkstra & Gest, 2015). Norm salience accounts for the influence popular students have on classroom norms and on behavior qualities considered valuable or attractive (Dijkstra & Gest, 2015). Norm salience scores are computed by correlating popularity to other peer-nominated behaviors to create a composite score at the classroom level (Dijkstra & Gest, 2015).

**Peer Victimization Subtypes.** Bullying is identified as a form of aggression (physical, verbal, or social) that is intentional and repeated and that, most importantly, indicates an imbalance in power within a relationship (Farmer et al., 2010; Olweus, 1993). Bullies are those individuals who engage in bullying and are not victims (Farmer et al., 2010). Victims are individuals targeted by bullying who are not perpetrators of bullying (Farmer et al., 2010). bully-victims are individuals who are victims, but who also participate in bullying.

**Perception of Bullying Ecology.** Peers play an important role within the bullying ecology, whereby they encourage, discourage, or maintain bullying within the classroom (Salmivalli, 2001). Research indicates that classroom norms are reflected by peers when they witness bullying behavior (Saarento & Salmivalli, 2015). That is, in classrooms that reinforce bullying as a norm, students are more likely to be involved in bullying than in classrooms where bullying is discouraged.
School Belonging. The collective effects of the classroom social dynamics discussed earlier greatly influence the sense of school belonging in students. School belonging has a significant impact on the psychological and academic wellbeing of students (Wang & Holcombe, 2010). Bullying environments within schools promote a native perception of school experiences, one of those being the sense of belonging (Harel-Fisch et al., 2011). Thus, school belonging is a useful measure to explain the influence of classroom social dynamics.

Collectively, these constructs are intended to cover all the dimensions of classroom social dynamics that influence bullying involvement. Research indicates that a bullying ecology emerges from the interplay of these and the individual factors that put students at risk for bullying involvement.

Rationale for Study of Problem

In combination, the constructs taken up here have the potential to help researchers better understand the classroom ecology as well as bullying involvement of students with disabilities within inclusive classrooms. In order to support these students, it is essential for practitioners in the field to take into account the norms that govern classroom social dynamics and to weigh the influence of popular students on these class norms. Understanding the influence of classroom social dynamics may in this and other ways help teachers create an environment that is conducive to learning, promotes positive peer relations, and diminishes the influence of bullying relations among students. Such efforts may benefit all students, especially students with disabilities.

Statement of Purpose

The goal of the proposed study was to clarify how classrooms are governed by popularity norms related to aggression characteristics or to academic and prosocial characteristics, using
latent profile analysis (LPA). The next step was to compare these different classroom types in terms of peer perception of social roles and reputations, social network centrality, bullying involvement, and school belonging, using the Hierarchical Linear Model (HLM) or Hierarchical Generalized Liner Model (HGLM). This study was focused on understanding the social relations of students with disabilities within these two class types. The information generated by this study will help guide the development of new intervention approaches that teachers may use to create more supportive classroom contexts for students with disabilities.

**Research Questions**

To address the overarching purpose of this study as outlined above, this research took up four specific aims:

1. Can inclusive general education classrooms in the late elementary school years be classified in terms of norm salience?

2. Do the social roles, reputations, and social network placement of students with disabilities differ in classrooms as a function of distinct types of norm salience (i.e., high aggression; high prosocial and academic)?

3. Does the peer victimization involvement of students with disabilities differ by classroom norm salience type?

4. Do students with disabilities have different perceptions of their classroom’s ecology in relation to classroom norm salience type?
Chapter 2

Review of Literature

As outlined in Chapter 1, social dynamics play an important role in school bullying. Efforts to clarify classroom peer processes in relation to the social adjustment of students with disabilities may generate new perspectives for intervention. Accordingly, this chapter explores several concepts that collectively operate to contribute to the social relations and bullying involvement of student with disabilities in general education classrooms. From this vantage, the first section presents a brief overview of classroom social dynamics. This includes a summary of measures and constructs that contribute to our understanding of classroom social dynamics. Further, the concept of the *classroom as a society* is described, and used as a way to think about how students organize their social world. In addition, norm salience is presented as a way of characterizing socially valued features in the classroom that influence social dynamics and students’ corresponding peer relations. The second section focuses on the peer relations of students with disabilities. The third section applies the lessons of these two research literatures as a lens for viewing the risk for bullying involvement of students with disabilities. The final section considers how current knowledge comes together to guide next research steps, including the research aims and questions for the current study.
Classroom Social Dynamics

Classroom social dynamics are complex, because individual students are constantly interacting within a fluctuating social network full of bi-directional influences (Farmer, 2007). Foundationally, Urie Bronfenbrenner’s research focused on social networks in the classroom context (Farmer et al., 2017). Bronfenbrenner (1943) discussed the need to understand student in the context of peer group ecologies that exist within the classroom to better support the students’ social development. He drew from sociometric research conducted by Moreno (1937) that focused on the need to measure constantly fluctuating social dynamics through processes of acceptance and rejection. Farmer (2007) reiterates the Cairns and Cairns (1991) theory of social synchrony, which explains behaviors of individuals within a social unit (e.g., classroom) as supportive of each other (see Chapter 1). In this process of forming social units, adolescents associate with certain peers and consolidate themselves into groups (Farmer, Reinke, & Brooks, 2014), and through this process they construct “their identities and status through their social interactions, and peer relations” (Farmer, 2000, p. 300).

Two ethnographic studies extensively observed social processes used by adolescents to form and maintain social networks (Evans & Eder, 1993; Adler & Adler, 1995). First, Adler and Adler (1995) examined the complex processes of inclusion and exclusion adopted by adolescent students to maintain social hierarchies within peer networks, and found that clique leaders employed various techniques to maintain their position within a hierarchical social structure. To maintain their social position, leaders were constantly adding or excluding members from their groups and reconfiguring their positions. Furthermore, to maintain their position within groups, students would synchronize their behaviors to imitate or complement the leader in order to sustain their relationship with the leader. In another ethnographic study, through extensive
observation of peer ecologies, Evans and Eder (1993) captured the plight of students who were socially scapegoated by peers, and observed that students with disabilities were at a greater risk of being isolated than were their non-disabled peers. Their study graphically detailed the social plight of students with disabilities, where a combination of their individual characteristics and the surrounding social dynamics put them at risk for being involved in problematic social relations. They noted that students who were marginalized had negative attributes that were amplified by their peers; furthermore, once they were marginalized, they were exposed to intense isolation and ridicule that made it difficult for them to form positive peer relations. Like Adler and Adler (1995), Evans and Eder (1993) documented hierarchical social structures in which students aimed to maintain their position within the classroom hierarchy by ridiculing students who were lower than them within it. This made it even more difficult for the isolated student to form positive peer relations that would insulate them from ridicule.

These two ethnographic studies highlighted the complexity and the fluidity of classroom social dynamics. The researchers collected extensive qualitative data to capture the constantly evolving classroom ecology over extended periods of time, which quantitative measures are ill equipped to capture successfully. However, quantitative measures are able to measure multiple constructs within a given timeframe and provide multiple ways of looking at classroom social dynamics and norms that are essential to understanding the layout of a classroom and identifying the norms that govern a class.

**Measures of peer relations and social dynamics.** The literature shows several constructs and associated measures of students’ social relations coming together to provide a comprehensive view of classroom social dynamics. These constructs include: **peer assessments of behavior, preference and sociometric status, popularity, peer group membership, social**
network centrality, perceptions of the peer ecology of bullying, and bullying involvement and peer victimization subtypes. This section discusses each construct and its measurement.

**Peer assessment of social behavior.** Peer assessments are reports of peer perceptions of an individual’s social behavior. Peer assessments are an important measure of peer interaction, as peers are privy to behaviors that are not always observed by adults (Coie et al. 1990). These measures required participants to nominate peers who best reflected specific behavioral characteristics, such as cooperative, disruptive, starts fights, gets in trouble, starts rumors, good student, friendly, athletic, cool, popular, acts shy, and sad. Many studies allowed participants to nominate up to three students who matched the descriptors for specific items (Estell et al., 2009; Estell et al., 2008; Farmer & Farmer, 1996; Farmer, Rodkin, Pearl, & Van Acker, 1999; Farmer, Van Acker et al., 1999; Rodkin et al., 2006); some other studies did not restrict the number of nominations (Frederickson & Furnham, 2004). Peer nominations were computed simply by aggregating the scores and dividing them by the total number of participants. To identify significance for a smaller sample size, the scores were multiplied by 100 (Farmer, Rodkin et al., 1999) or 1000 (Estell et al., 2009) to create proportional scores that allowed comparisons between classrooms with different sizes and helped to clarify mean differences. Students viewed as aggressive (disruptive, starts fights, gets in trouble) were more likely to be involved in bullying relations than students who were nominated as cooperative, good students, or friendly (e.g. Farmer, Estell, Bishop, O’Neal, & Cairns, 2003). However, only limited research focusing on peer nominations includes students with disabilities within mainstream classrooms (see “Social Relations of Students with Disabilities” section below for more details).

**Preference and sociometric status.** Since the 1930s, researchers have studied peer preference of individuals within a social network (Asher & McDonald, 2009); sociometric
measures have been used to measure student acceptance or rejection in this context (Asher & McDonald, 2009). In the early 20th century, Moreno’s work revolved around “measuring and determining social relationships” (Cillessen, 2009, p. 83) between two individuals who were governed by forces of attraction and repulsion (Hartup, 2009). Moreno developed sociometric tests that asked participants to identify individuals and scenarios with whom they would like to interact; he used sociograms to visually represent these findings. Within a sociogram, a circle represents the individual and lines and arrows represent the forces of attraction and repulsion connecting them to other individuals within the social network. Over the years, sociometry as a science has evolved in methodology, but at its crux, it still aims to gain insight into acceptance of each other among individuals in groups. Gathering information from sociometric tests has been critical for our understanding of social norms that govern social roles and relationships among peers. Basic data on whether a student is liked or disliked by their peers is then translated into “accepted” or “rejected” status (Cillessen & Marks, 2011; De Bruyn, Cillessen, & Wissink, 2010; Estell, Farmer, & Cairns, 2007; Hartup, 2009). At their core, sociometric methods inform researchers about positive and negative peer relations (Cillessen, 2009); however, acceptance or rejection by peers is more complex. As Cillessen (2009) pointed out, sociometric status always needs to be interpreted in the context of the group and classroom social dynamics.

Peer nominations for social status are a reliable and valid method of gaining insight into whether a student is accepted or rejected within a classroom (Cillessen & Marks, 2011; Hartup, 2009). Peer nominations require students to nominate the peers they like most and least within their social networks. Some measures allow unlimited free recall, while other tests limit free recall to three nominations in each category. Still other measures use a round-robin design, in which students go through a list of their peers and rate each peer (Asher & McDonald, 2009).
Distinct sociometric categories have been shown to be differentially related to bullying involvement (Evans & Eder, 1993). However, as noted above, research on the sociometric status of students with disabilities, including that using peer nomination, is limited, and will be discussed as part of the discussion of social relations of students with disabilities below.

**Popularity.** Popularity is a measure of “power, prestige, or visibility” (Cillessen & Marks, 2011, p. 28), used to evaluate the student’s social standing. Unlike the construct of acceptance, where peers rank or nominate those whom they like most and like least, popularity measures require participants to nominate ‘most popular’ and ‘least popular’ peers (Cillessen & Marks, 2011). It is intuitively clear that being popular is not the same as being liked; for instance, popular students often use aggression to maintain their leadership position (Alder & Adler, 1998, Cillessen & Marks, 2011; De Bruyn et al., 2010; Estell et al., 2007). In the past, *perceived popularity* was the term used to define the construct of popularity (Cillessen & Marks, 2011), reflecting this distinction. Popularity is also linked to peer-assessed behavior characteristics like *cool, athleticism, leadership,* and *popular* (see the section on peer assessment of behavior), and popularity itself has been viewed as a behavior characteristic and assessed using peer nominations—to nominate peers who (the respondents viewed as) popular among peers (Estell et al., 2008; Estell et al., 2009; Farmer & Rodkin, 1996). Some studies have also used the term *cool* to describe students who were known by everybody in the school. Similar to the assessment of behavior characteristics, participants are required to nominate three peers that best meet the criteria for popularity or cool. Studies indicate that popular students may use aggression as a means to maintain their popularity, and that popularity also puts them at a higher risk for being involved in bullying relations (Adler & Adler, 1995; Estell, Cairns, Farmer & Cairns, 2002).
Peer group membership. To understand classroom social dynamics, it is important to understand peer group affiliation. Research on social dynamics indicates that students interact and form peer groups with other students who share the same characteristics (Adler & Adler, 1995). Cairns developed the Social Cognitive Mapping (SCM) method based on the principle that students are expert observers within classroom settings and noting that students had similar views of peer network clusters within classrooms. Cairns and his team used simple prompts that required students to list peers that socialized in the same groups within their classrooms. The team then aggregated this information to make composite socio-cognitive maps of classrooms that presented a vivid picture of their composition (Gest, Farmer, Cairns, & Xie, 2003). These socio-cognitive maps provided details on peers who affiliated with each other and/or were part of the same social group. Furthermore, researchers using SCM have pointed out that peer groups are formed around synchronized behaviors and are often organized hierarchically (Farmer, Lines, & Hamm, 2011; Farmer & Xie, 2013). Research using SCM indicates that classrooms’ social structures are fluid and dynamic and that peers use a variety of strategies to constantly renegotiate their power to form peer groups within such structures (Cairns & Cairns, 1994; Farmer & Xie, 2013). Furthermore, researchers hold that not only are students astute observers and reporters of peer social networks, they are also aware of the constantly changing “cognitive map” of their classroom (Cairns & Cairns, 1994; Farmer & Xie, 2013; Gest et al., 2003), with better insight into peer connections, group membership (in their own and other groups), and activities within the classroom; thus, students can provide a highly detailed image of the classroom ecology. The characteristics of peer groups are often related to students’ level of bullying involvement (Estell et al., 2007).
**Social network centrality.** As students organize themselves into hierarchies (Adler & Adler, 1996), social network centrality measures aim to identify the social position of a student in relation to peers within their group and classroom (Farmer & Farmer, 1996; Farmer et al., 2011), thereby yielding generalized information on positive and negative aspects of social preference and popularity (Farmer et al., 2011, Farmer, 2000). Social networks identify members within groups as *nuclear, secondary, or peripheral* members. Nuclear members, identified as the primary members of a group, are those who have the maximum number of nominations within the group. Secondary members are part of the group, but not as important as nuclear members and lower in the hierarchy. Peripheral members are not key players within the group, are low in the hierarchy, and are at a greater risk for social marginalization. Individual students who are not part of any group are considered “isolate”, as they are not linked to any other student within the social network. Linking the previous constructs, research indicates that students who are peripheral or who are isolates are more likely to be involved in bullying relations, particularly as victims, and that nuclear students are often bullies than other students (Estell et al., 2007; Evans & Eder, 1993).

**Bullying involvement subtypes.** Bullying is defined as (a) unwanted aggressive behavior (b) between students of unequal power that is (c) intentional and repeated (Farmer et al., 2010; Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014; Olweus, 1993). Students are involved within the bullying ecology, as either bullies, victims, or bully-victims. Bullies are those individuals who engage in bullying and are not victims of bullies (Farmer et al., 2010). Studies have identified bullies as more likely to feel powerful than their victims (Farmer et al., 2010) and, refuting the popular belief that bullies are unpopular, have concluded that bullies are in different cases respected, feared, or even liked (Farmer et al., 2010). Victims are individuals
exposed to bullying who are not perpetrators of bullying (Farmer et al., 2010); low academic achievement, poor social skills, and unusual appearance are key factors that contribute to being bullied (Evans & Eder, 1993). Researchers characterize victims as often shy, small, weak, anxious, insecure, impulsive, unpopular, isolated, and/or lacking social skills (Farmer et al., 2010). The third category, *bully-victims*, are a combination of bullies and victims, that is, victims of bullying who also participate in bullying. These students are more aggressive and have few friends (Farmer et al., 2010). Rodkin (2011) identified students who are neither perpetrators nor victims as *bystanders*; these students “witness bullying,” and thus they too are perpetuating bullying. In this study, however, I used the term *not involved* to identify these students.

**School belonging.** All the above indicators influence students’ sense of belonging within the classroom and the school. Students with a positive sense of school belonging feel secure, and view their environment as supportive; they build positive connections within the school, which further encourages them to participate and develop a positive attitude towards school (Goodenow & Grady, 1993; Hamm & Faircloth, 2005). Studies indicate that students with a greater sense of school bonding are more likely to be task oriented, have a positive sense of achievement, and be oriented towards positive classroom goals (Davidson, Gest & Welsh, 2010). Studies have also found positive relations between school belonging and social and emotional functioning (Murray & Greenberg, 2000) and decreased behavioral difficulty among students (Chapman, Buckley, Sheehan, Shochet, & Romaniuk, 2011). A school environment that foster bullying creates a negative sense of school belonging among students, negatively affecting academic goals and achievement (Popp & Peguero, 2012).

**Perception of bullying ecology.** Peers are an important part of the bullying equation. Victims who have peers to support them are more likely to be insulated from bullying (Doll,
Song, & Siemers, 2004; Rodkin, 2011). Furthermore, students’ perception of their peer ecology influences their will to intervene on behalf of the victim or to support the bully (Salmivalli, 2010). The *Protective Peer Ecology Scale* (Song, 2005) measures a child’s beliefs about whether their classmates are likely to protect a victim of bullying or to encourage the bully; research indicates that classrooms norms are reflected in peers’ reactions to bullying behavior (Saarento & Salmivalli, 2015). This measures also reflects students’ own inclination to protect others from bullying. Few studies have used this measure (one that has is Hamm, Farmer et al., 2010).

**The classroom as a society.** Over the years, researchers like Farmer, Rodkin, and their colleagues have aimed to situate bullying within the larger social dynamics of the classroom rather than taking it as a discrete occurrence between the bully and the victim (Ahn & Rodkin, 2014; Rodkin, 2011). Ahn and Rodkin (2014) used the ecological perspective to bring to light the role classroom social dynamics played in facilitating or negating the effects of bullying. They describe the classroom as a society influenced by student interactions. This idea is supported by researchers such as Pepler, Craig, and O’Connell (2010) who pointed out that students’ interactions are shaped by and in turn influence their social context. Dijkstra, Lindenberg, and Veenstra (2008) report that classrooms in which high-status students exhibit aggressive characteristics are conducive environments for bullying.

Thus, these constructs—*peer assessment of behavior, acceptance, popularity, peer group membership, network centrality, peer perception of bullying ecology, bullying involvement subtypes, and school belonging*—collectively inform us of the risk of a student’s becoming involved in bullying relations. Students viewed as aggressive or disruptive are at greater risk of such involvement (e.g., Farmer & Farmer, 1996); being part of social networks and being accepted by peers, in contrast, protect the student to some degree from involvement in bullying.
relations (Rodkin, 2011; Salmivalli, 2010). Students who are popular and socially skilled use prosocial techniques to maintain their popularity, while rejected students are perceived as aggressive and thus likely to be involved in bullying relations (Salmivalli, 2010). Students affiliated with peers who exhibit bullying behavior are at greater risk for involvement in bullying relations, as they are more likely to synchronize their behavior to maintain their peer relationships or their position in the social hierarchy (Adler & Adler, 1995).

Bronfenbrenner and Evans (2000) explain the *proximal process* within the ecological framework, which is beneficial for understanding classroom social dynamics as ecology. First, individuals are constantly interacting within their ecologies (the proximal process), where they acquire positive experiences (competencies) or exhibit dysfunctional relations. Second, experiences within the proximal process influence future outcomes. Third, to gain positive experiences and develop into a well-rounded person, it is essential to establish positive relations with other people within the ecology and create strong positively reinforcing bonds. This implies that students exhibiting negative social skills therefore experience dysfunctional relations with their environment and social interactions; and once they are perceived to exhibit negative social behaviors, they continue to be viewed in terms of those negative characteristics—and as a result, often, not accepted by their peers, excluded from peer groups, and socially isolated (e.g., Evans & Eder, 1993). Thus, the concept of the classroom as an active zone of proximal processes externally influencing individual students is an essential element of classroom social dynamics.

*Norm salience.* Norms are social phenomena that influence the general behavior of a group (Lapinski & Rimal, 2005). Thus, understanding classroom norms regarding bullying provides insight into the collective processes that govern student behavior within the classroom. Sentse and colleagues studied the influence of classroom norms on peer preference and bullying
involvement by measuring descriptive norms (i.e., behaviors and values as characterized by the group; Sentse, Veenstra, Kiuru, & Salmivalli, 2015). They noted that in classrooms where bullying was not the accepted norm, students identified as bullies by their peers were less likely to be accepted by peers and more likely to be rejected, as they did not adhere to the norms that governed the classroom. Conversely, in classrooms in which bullying was considered to be an accepted norm, students identified as bullies were more likely to be accepted. This study indicates that norms are an important indicator of socially accepted behaviors within classrooms, and further that behaviors that frequently occur within the classroom are more likely to be the same as those considered “normative and legitimate” and thus to be accepted and replicated (Sentse et al., 2015, p. 944).

Researchers who study classroom norms have observed that popular students have a disproportional influence on classroom norms, as they have great power to influence their peers (Dijkstra & Gest, 2015; Dijkstra et al., 2008). Thus, norm salience measures weigh popularity as a factor influencing classroom norms, to account for the influence of behaviors by high-status peers (Dijkstra & Gest, 2015; Dijkstra et al., 2008; Garandeau, Ahn, & Rodkin, 2011).

Three studies have focused on the influence of norm salience on bullying involvement within classrooms. First, Dijkstra and his team studied the extent to which bullying behavior by popular students influences the general acceptance or rejection of bullying within classrooms (Dijkstra et al., 2008). This study highlighted the degree to which popularity norms governed classroom behavior: in classrooms in which popular students were involved in bullying, such behavior was accepted as the norm, as their involvement reduced the negative stigma of being involved in bullying (Dijkstra et al., 2008).
Adding to this research base, Garandeau et al. (2011) observed that aggression was more accepted as students matured—specifically, aggressive students had higher social status in fifth grade than in fourth grade. Furthermore, they observed that classroom hierarchy greatly influenced aggression levels within classrooms, and in particular that popular students were more likely to be involved in aggression in hierarchical classrooms. Academic achievement was another moderating variable on aggression within classrooms; classrooms that valued academic achievement had lower levels of aggression than classrooms that did not.

Finally, Dijkstra and Gest (2015) used cluster analysis to identify two types of classroom that influenced peer experiences in class: (1) popular norms that were positive for academic achievement and prosocial and were neutral towards bullying; and (2) norm salience that was negative for academic achievement, positive for bullying, and neutral for prosocial.

Collectively, these studies indicate that popular students are influential in creating classroom norms. Furthermore, these norms influence not only bullying involvement within the classrooms but also academic achievement and other factors affecting classroom social dynamics. These studies thus emphasize the need to consider and address the behavior of popular students in order to influence all the students within a classroom.

However, none of these studies focused on students with disabilities within their sample. Future studies need to take into account the roles and relations of students with disabilities in inclusive classrooms, as schools are becoming more inclusive and students with disabilities are becoming more likely to be part of the classroom ecology.

**The Social Relations of Students with Disabilities**

This section reviews the literature on social dynamics constructs related to the social relations of students with disabilities within mainstream classrooms.
Peer assessment of social behavior. Nabuzoka and Smith (1993) compared students with learning disabilities (LD) and their peers with no such disabilities on six behavior characteristics: cooperates, disrupts, shy, starts fights, seeks help, and leader. Compared to their non-disabled peers, students with LD received more nominations for being shy and seeking help, and fewer nominations for being cooperative or being a leader; there were no significant differences on the variables disrupts or starts fights. Farmer and Farmer (1996) qualitatively analyzed peer groups within classrooms in terms of behavioral characteristics, analyzing each variable at the individual level. This made it possible to identify behaviors specific to students with disabilities within the sample. The results indicated that two students with emotional and behavioral disorder (EBD) received a high number of peer nominations for aggressive qualities—starting fights and being disruptive—and for being athletic. However, other students with disabilities in this sample were viewed as shy by their peers. All students with disabilities in this group associated in groups with peers who exhibited similar characteristics (whether aggressive or shy). Thus, students viewed as aggressive had peers who were also nominated as being aggressive, and students viewed to be shy associated with peers who were nominated to be shy.

Farmer, Van Acker et al. (1999) compared problem behavior (peer nominations for disruptive, starts fights, and gets in trouble) in students with disabilities to that of their non-disabled peers. The results indicated that the majority of students identified by their peers as highly aggressive and disruptive in inclusive classrooms were not students with disabilities. One-third of all students with disabilities in the study were nominated by peers as having high problem behavior (average composite score of disruptive, starts fights, gets in trouble), and they comprised one-fifth of the high problem behavior nominations. Students with disabilities
received more nominations for high problem behavior than low problem behavior, whereas students without disabilities and students identified as academically gifted received more nominations for low problem behavior.

The results of the Farmer, Rodkin et al. (1999) study indicated that peers viewed some boys with disabilities as cool and antisocial compared to their non-disabled peers; these boys were also viewed by their teachers as tough (teacher-rated aggressive and popular). This study indicates that male students with disabilities who were viewed as antisocial by teachers were viewed as popular by their peers.

Frederickson and Furnham (2004) asked students to nominate peers they would prefer to play with and work with, allowing them to associate peers with certain activities. The study used cluster analysis to identify specific behavioral characteristics associated with these sociometric results. Analyses indicated that there were two distinct clusters for play with. Students with disabilities in the first cluster were identified as more likely to be aggressive or disruptive, prone to starting fights, and not cooperative. The second cluster captured students with disabilities viewed as shy or unhappy, and less likely to be cooperative and funny. Peers characterized students with disabilities as aggressive/disruptive to work with; students in this cluster were more likely to be disruptive or to start a fight and less likely to be viewed as cooperative.

Rodkin and his colleagues (2006) identified qualities peer-nominated as cool by students with disabilities: student who were viewed as leaders, athletic, and prosocial were viewed as cool by children with disabilities in their class. Estell, and his team (2008) aimed to study the popularity of students with LD in mainstream classrooms; the results indicated that students with LD received fewer nominations for popularity compared to their non-disabled peers. Estell et al. (2009) studied peer-nominated behavior associated with peer-nominated involvement in
bullying, and found that peers viewed students who bullied to be *disruptive, start fights, get in trouble, and start rumors*. These four variables were combined into a single indicator for aggressive behavior, based on which students with disabilities were more likely to be viewed as bullies by their peers compared to students without disabilities or academically gifted students.

These seven studies represent the general perception peers have of students with disabilities. Five of the seven indicate that peers perceive students with disabilities to be more aggressive; they received a high number of nominations for being *disruptive, starting fights, or getting in trouble* (Farmer & Farmer, 1996; Frederickson & Furnham, 2004, Estell et al., 2009), with evidence indicating that some were also perceived to be *shy* and *withdrawn* (Farmer & Farmer, 1996). Not all aggressive behavior was viewed negatively by peers; as Farmer, Van Acker et al. (1999), found, students with disabilities identified as *aggressive* were also identified as *cool*. Similar findings were observed by Farmer and Farmer (1996). Two students with EBD who received high nominations for the *starts fights* and *disruptive* categories were also viewed by peers to be athletic. Finally, the studies indicated that students with disabilities affiliated themselves with peers who shared similar characteristics (aggression or shyness) (Farmer & Farmer, 1996; Farmer, Van Acker et al., 1999). These findings are in line with the social dynamics perspective, which suggests that students affiliate with peers who share similar characteristics.

**Preference and sociometric status.** This section reviews literature on the sociometric status of students with disabilities and aims to shed light on the social interactions of these students.

Sabornie and Kauffman (1986) compared the sociometric status of students with LD to that of their non-disabled peers in high school physical education classes, using a matched-pairs
design. Of 46 students with LD in the sample, 20 scored at or above the mean sociometric scores of their non-disabled peers, indicating that students with disabilities were *not isolated* and were *accepted* within their social groups. In contrast, Kistner and Gatlin (1989) compared the sociometric status of students with LD and their non-disabled peers in mainstream elementary classrooms and found that students with LD were slightly more likely to be *rejected* by their non-disabled peers. Further analysis indicated that sociometric status of students with LD was not tied to their intellectual abilities but to their social behavior: students with LD who were perceived to be *aggressive* or *withdrawn* were more likely to be *rejected* than accepted by their peers.

Bear, Juvonen, and McInerney (1993) compared self-perception of social preference (acceptance) among students with LD and their non-disabled peers. The results indicated that boys with LD were *accepted* by their peers and were frequently nominated by their peers in terms of reciprocal friendship. The study had few female participants for comparison, however. Haager and Vaughn (1999) compared the sociometric status of students with LD to that of non-disabled students who were academically high performing and academically low performing (respectively). Among the three groups, academically low-performing students were more likely to be *rejected* by their peers compared to the other two groups of students. However, Estell et al. (2008) studied the social preference (acceptance) of students with LD within mainstream classrooms, and found that these students were consistently *less accepted* by their peers and that their sociometric status did not change over time.

Sabornie and Kauffman (1987) compared the sociometric status of students with intellectual disability (ID) to that of their non-disabled peers within the same age group; data
were analyzed using a matched pairs design. The results indicated that students with ID were more likely to be rejected by their non-disabled peers and vice-versa.

Sabornie, Kauffman, Ellis, Marshall, and Elksnin (1987) compared the sociometric status of students with LD, students with EBD, and their non-disabled counterparts. The results indicated that students with disabilities (LD and EBD) were more accepting of their non-disabled peers and held a more positive attitude towards their peers than their classmates held toward them; that is, non-disabled peers were more likely to reject their peers with disabilities. Further analysis indicated that type of disability also played a role in sociometric status; students with EBD were more likely to be rejected compared to students with LD.

Sale and Cary (1995) studied the sociometric status of mainstream students with and without disabilities, and identified students who likely had disabilities but were not receiving services. They found that students likely to be identified with a disability received the highest number of nominations for being liked least by peers; students with disabilities followed them. Non-disabled peers received the most nominations for being liked by peers. The study indicated that students with possible disabilities were even more likely to be sociometrically rejected by their peers than those with actual diagnosed disabilities; lack of disability identification exposed them to greater social rejection, as their peers were more likely to interpret their behavior as inappropriate.

Of the eight studies analyzed in this section, six focused on students with LD; one study also included students with EBD, another one focused on students with ID, and one was unspecified. On the whole, the findings suggested students with disabilities are more likely to be sociometrically rejected and less likely to be accepted by their peers within mainstream classrooms. A variety of factors contributed to the findings, and there were some variable
differences within the findings. For example, in the Sale and Cary (1995) and Haager and Vaughn (1995), students who had academic difficulties and were at risk of disability diagnoses were more likely to be rejected by peers than students with identified disabilities. On the other hand, Kistner and Gatlin (1989) found that social behavior was an indicator of sociometric status.

**Popularity.** Some studies provide insight into characteristics that may be viewed as associated particularly with students with disabilities.

Farmer, Rodkin et al. (1999) reported that boys with disabilities were viewed as cool and antisocial by their peers. In the same study, one-fifth of boys with disabilities who were reported as aggressive and popular by teachers were viewed as cool by their peers. These findings are congruent to other studies that link aggressive/problem behavior to popularity among boys (Farmer et al., 1999). For instance, Farmer and Rodkin (1996) studied the relation between behavior characteristics and network centrality of students with disabilities within the mainstream classroom. Boys with EBD who were nominated as popular were more likely to have nuclear centrality, versus low centrality.

Similarly, Rodkin et al. (2006) studied what characteristics were considered cool by students with disabilities. Students with disabilities nominated students who were viewed as leaders, athletic and/or having prosocial attributes as the coolest peers in their class. Boys with disabilities were likely to nominate students with aggressive attributives (getting into fights and getting into trouble) as cool.

Estell et al. (2008) conducted a longitudinal study of the social standing of students with LD, finding that they were slightly less popular than their non-disabled peers and that this pattern did not change over time. Subsequently, Estell et al. (2009) studied the association of behavioral characteristics and involvement in bullying relations, and found that students with
disabilities within the mainstream classroom were equally likely to be considered aggressive and popular, and that students with disabilities who were affiliated with aggressive and popular peers were more likely to be viewed as bullies.

Thus, studies indicate that students with disabilities were not always isolated but were also not as popular as non-disabled or academically gifted students (Estell et al., 2008). Other studies have identified students with EBD as aggressive and popular (Farmer & Rodkin, 1996; Farmer et al., 1999; Rodkin et al., 2006). It has been shown that students with disabilities associate themselves with popular and aggressive peers to improve their social standing and protect themselves from victimization (Estell et al., 2009).

Peer group membership. This section of the dissertation reviews literature on peer group membership of students with disabilities within mainstream classrooms.

Farmer and Hollowell (1994) aimed to understand the social relations of students with EBD within mainstream classrooms. The results indicated that students with EBD were members of peer groups; however, they also affiliated with peers who shared similar behavioral characteristics. They found students with EBD to be viewed as students who started fights, were disruptive, were not good at schoolwork, and were not cooperative with their peers. Students within the sample also tended to affiliate with peers who shared the same behavioral characteristics and exhibited similar problematic behaviors. Of the 20 students with EBD, only three students were not part of a group, while six students with LD (n = 20) were not affiliated with a group; this was substantially high compared to the three academically gifted (n = 62) students and 23 general education (n = 229) students who were not part of any peer groups.

Farmer and Farmer (1996) used similar measures to Farmer and Hollowell (1994), but represented the quantitative data in a qualitative manner, while Farmer and Howell (1994) used a
more quantitative approach to data analysis. Similar to Farmer and Hollowell (1994), in the Farmer and Farmer (1996) study all 11 students with disabilities were members of peer groups that shared similar characteristics (again, sometimes aggressive and sometimes shy/withdrawn).

Farmer et al. (1999) found that 81% of students with disabilities were part of peer groups, of which 23% were identified as high-problem-behavior groups. This finding was congruent with the Farmer and Hollowell (1994) and Farmer and Farmer (1996) research that indicated that students affiliated themselves with peers who shared the same behavioral patterns. Farmer and colleagues (2011) studied peer group membership of students with disabilities in rural high schools. Their findings were similar to the four studies already discussed (that is, students with disabilities were part of peer groups) but they also found that those students were affiliated with peers who had problem behaviors and school adjustment problems.

Pearl and her team (1998) aimed to study peer perceptions of the group membership of students with disabilities in mainstream classrooms. The results indicated that out of the 198 students with disabilities within the sample, 37 were isolates, compared to 84 students out of the 1,340 identified as gifted or in general education program—a significantly higher percentage.

Taken together, this body of research thus clearly shows that most students with disabilities are members of peer groups, but that compared to their non-disabled counterparts they are more likely to be isolated, affiliated with peers who share similar aggressive behavioral traits, or experiencing social adjustment problems within the classroom. Affiliating with peers who have aggressive traits then puts students with disabilities at higher risk for involvement in aggressive behaviors such as bullying and peer victimization.

**Social network centrality.** This section of the dissertation reviews literature on the social network centrality of students with disabilities within mainstream classrooms.
Farmer and Farmer (1996) visually analyzed the network centrality of each of their participants, and found that all students with disabilities were part of peer groups. Three students with EBD were identified as *nuclear* members of their respective groups, and one was identified as a *secondary* member. Most students with LD were identified as *secondary* members of their groups, and only one student was identified as a *nuclear* member. Students with EBD who were *nuclear* members of their groups were characterized by their peers as *aggressive* (*starts fights, disruptive*) and *athletic*.

Farmer and Rodkin (1996) further explored the relation between peer-assessed behavior and network centrality, in male participants. Findings were specific to male participants with disabilities, as the sample size for female participants with disabilities was not adequate for analysis. In this study, students with EBD who had *nuclear* centrality were identified as being popular and *athletic* by their peers, and also as *aggressive* and *disruptive* irrespective of network centrality, while students with LD who had *nuclear* centrality were viewed as *cooperative*. In the study, boys with EBD were attributed to being *aggressive* and *disruptive*, irrespective of their network centrality.

In another study, Farmer and colleagues (2011) studied the social network centrality of rural high school students with disabilities, and found that they were generally part of peer groups but were at a higher risk of being *isolated, peripheral, or secondary* rather than *nuclear* members, and as in the other studies discussed, affiliated with peers who had negative behaviors.

Chen et al. (2015) aimed to study change in the social network centrality of students over time in relation to bullying involvement. Students with disabilities in this study were more likely to be identified as *isolates or peripheral* members within peer groups and least likely to be identified as *nuclear* members. Almost two-thirds of students with disabilities were identified as
socially marginalized, and two-thirds were identified as secondary members of a group. Moreover, students who were categorized as isolates or peripheral within social networks were more likely to be involved in bullying over time.

Summative analyses of these studies indicated that, students with disabilities were generally part of social networks, but were more likely to be viewed as isolates or peripheral members of their groups (Chen et al., 2015; Farmer et al., 2011). This is easy to understand in light of the previous sentence most of the studies indicated that students with disabilities affiliated themselves with peers who shared similar behavior traits (e.g. Farmer et al., 2011).

**Bullying involvement subtypes.** Research indicates that students with disabilities are at a higher risk of being involved in bullying relations compared to their non-disabled peers (Blake et al., 2012; Rose et al., 2009). Blake and her team of researchers used the Special Education Elementary Longitudinal Study and the National Longitudinal Transition Study-2 data sets to identify the prevalence of bullying involvement among students with disabilities in a national sample. The results indicated that 34.1% of middle school students with disabilities, 24.5% of elementary school students with disabilities, and 26.6% of high school students with disabilities were involved in bullying relations. The findings of this study are congruent with other studies that indicate students with disabilities are at a higher risk of being involved in bullying relations as compared to their non-disabled peers (e.g., Rose et al., 2009; Rose & Espelage, 2012; Swearer, Wang, Maag, Siebecker, & Frerichs, 2012; Zablotsky, Bradshaw, Anderson, & Law, 2013). Farmer et al. (2015) found that students with disabilities were more likely to be involved as victims or bully-victims than as bullies.

Farmer and colleagues (2012) found that fewer students with disabilities than general students were bullies, and characterized bullies as having positive social skills, better school
bonding, and fewer problems with school adjustment. They also found that students with disabilities who associated with aggressive and/or popular peers were more likely to be bullies than victims. Based on the social dynamics framework, they inferred that associating with popular and aggressive peers insulated students with disabilities from being victimized.

Victims of bullying have been found to exhibit high levels of internalizing behaviors, like anxiety, depression, and social withdrawal (Hodges, Malone, & Perry, 1997; Juvonen & Graham, 2014), continuing into their adult life (Copeland, Wolker, Angold, & Costello, 2013). Students who are victimized are generally either isolates or associated with peers who are socially marginalized; they also lacked social skills (Swearer et al., 2012). Students with disabilities were found to be at a greater risk of being victimized, more socially isolated, and affiliated with marginalized peers who did not have the social standing to shield them against bullying. Furthermore, they had deficits in social communication and competencies (Zablotsky et al., 2014) and exhibited higher risk for depression and internalizing behavior problems (Estell et al., 2009; Rose et al., 2013). Within the social hierarchy, students with disabilities who were isolated were at a greater risk of being bullied than students with disabilities who had unpopular friends, who in turn were at a greater risk of being bullied than students with disabilities that associated with popular peers (Estell et al., 2009).

Students identified as bully-victims have been characterized as having problems with social competency, being more likely to be rejected by peers, and tending to be more isolated or affiliated with low-status peers (Juvonen & Graham, 2014; Schwartz, 2000). These students responded to negative social situations in a way that further exposed them to victimization (Rodkin, 2011): they used physical and verbal means to perpetuate bullying, and were on the receiving end of physical, verbal, indirect, and cyberbullying more often as compared to students
who were only victims (Yang & Salmivalli, 2013). These problems were amplified for students with disabilities who were socially not as skilled as their peers, as they found it difficult to maintain positive interpersonal relationships, which led to aggressive outbursts (Evans & Eder, 1993; Rose & Espelage, 2012). Furthermore, Zablotsky and his team (2014) observed that students with disabilities who had “difficulty making friends” (p. 424) were more likely to be involved as bully-victims.

**Summary of the Social Relations of Students with Disabilities**

The constructs adopted in this study and explored via the previous research in this chapter are useful in creating a composite picture of the social relations of students with disabilities. Viewed individually, they give us only a fragmented understanding of peer relations, but viewed together, these constructs help create a more coherent picture of classroom social dynamics that gives us stronger insight into the social relations of students with disabilities and the factors that contribute to their vulnerability to involvement in bullying relations.

A review of the literature indicated that most students with disabilities were part of peer groups, but that these associations were mostly with peers who were equally marginalized or had aggressive social traits that reinforced and furthered focal students’ social difficulties (Estell et al., 2007; Farmer & Farmer, 1996; Farmer & Hollowell, 1994; Farmer, Leung et al., 2011). Furthermore, 20% of students with disabilities were isolated, and large numbers of them were identified to be peripheral or secondary in terms of network centrality. By associating with peers who had low network centrality, students with disabilities were at increased risk of being involved in bullying relations (Chen et al., 2015; Estell et al., 2009; Pearl et al., 1998). In some studies, meaningful numbers of students with disabilities associated with popular students, but these popular peers were most often leaders of aggressive groups, making the students with
disabilities followers or easy targets (Farmer et al., 1999; Farmer & Rodkin, 1996; Rose et al., 2015). Furthermore, these students associated with peers that supported or maintained their problematic behavior and aggravated their risk of being involved in bullying relations (Chen et al., 2015; Estell et al., 2009; Farmer et al., 2015; Rose & Espelage, 2012; Rose et al., 2012).

Bullying involvement has been associated with a host of internalizing and externalizing problems (Blake et al., 2012, Estell et al., 2009), and students involved in bullying relations had difficulty with school adjustment and exhibited lower levels of school belonging and academic achievement (Chen et al., 2015; Farmer, Petrin et al., 2012).

**Students with Disabilities at Risk for Bullying Involvement**

Students with disabilities have difficulty with social skills, communication skills, and internalizing and externalizing behaviors that put them at a higher risk of being involved in bullying relations (Blake et al., 2012; Christensen, Fraynt, Neece, & Baker, 2012; Estell et al., 2009; Evans & Eder, 1993; Rose & Espelage, 2012; Rose et al., 2013). Early adolescence encompasses years of social dissonance, in which students aim to form peer relations and find their place within the classroom social hierarchy. In the process, they used complex processes to include or exclude peers from their social networks while jockeying for power and status (Adler & Adler, 1995). Students with disabilities are on the whole at a disadvantage in this regard because they are generally socially less competent (Siperstein et al., 2007) and have fewer friends who are willing to intervene or befriend them and protect them from peer victimization (Evans & Eders, 1993). Students with disabilities are less likely to be accepted by their peers and more likely to be disliked by their non-disabled peers (de Boer, Pijl, Post & Minnaert, 2013; Frederickson & Furnham, 2004; Sale & Carey, 1995). Research using social network centrality measures has indicated that students with disabilities are more likely to be isolated or to have
lower levels of network centrality (Chen et al., 2015); also, they associate with peers who share similar behavioral characteristics and who are therefore also on the whole more vulnerable to peer victimization (Farmer, Leung et al., 2011).

Adding another aspect to classroom social dynamics are the norms that govern classrooms, which significantly influence beliefs and values on aggression, especially those held by popular students (who are more likely to adhere to classroom norms). Research indicates that classrooms in which popular students are viewed as aggressive have higher levels of bullying involvement (Dijkstra et al., 2008).

Bullying involves unequal power equations (Olweus, 1993). Students with disabilities have a hard time being accepted by peers, as they are often viewed as “different” and garner low peer preference (Rose, Swearer, & Espelage, 2012). Studies have documented the negative effects of peer victimization, both immediate and long term. Blake and her team (2016) concluded that students with disabilities who exhibited internalizing problem behavior and showed signs of being unhappy were more exposed to being bullied by their peers, including repeated instances over time. In another study comparing youth with autism spectrum disorder (ASD), youth with ID, and typically developing (TD) peers, both mothers and youth reported that students with autism were at greatest risk of being bullied, followed by students with ID and then TD peers (Zeedyk, Rodriguez, Tipton, Baker, & Blacher, 2014). Within the study, however, there was poor agreement between mothers and youths with ASD and ID on bullying experiences, indicating that students with ASD and those with ID had difficulty identifying instances of bullying (Zeedyk et al., 2014). That study highlighted an important problem related to bullying of students with disabilities: the inability to identify instances of bullying due to the characteristics of their disability. Students with disabilities were often easy targets of bullying.
because they not only had difficulties with academic achievement, the characteristics of their disability made it difficult for them to navigate social situations (Blake et al., 2014; Young, Ne’eman, & Gelser, 2012). However, Rose et al. (2009) reported that students with disabilities who spent some or most of their time in mainstream classrooms experienced less bullying and victimization as compared to students with disabilities who spent all their time in segregated classes. Thus, the research suggests that segregated education is not the answer to the problem. Instead, schools need teachers who can address and leverage social support to a positive learning environment to prevent instances of bullying among all students.

**Research Needs and Implications for the Current Study**

Teachers have the opportunity to understand the influence of classroom social dynamics and leverage the classroom environment to facilitate positive peer interactions (Farmer et al., 2011; 2017) and create a positive learning environment that fosters respect and reduces instances of bullying. They are rightly identified as key stakeholders on the “front lines” of addressing bullying in schools, and can leverage social situations to protect students from bullying situations (Ihnat & Smith, 2013; Troop-Gordon, 2015). Most teachers view bullying or peer victimization as a serious problem within schools (Troop-Gordon, 2015; Bauman & Hurley, 2005), and play a crucial role in bullying intervention. Farmer et al. (2011) dub teachers an “invisible hand,” not only instrumental in preventing instances of bullying, but also an integral part of future research on the topic, as they can greatly influence “classroom social ecologies” (p. 247). In turn, study of classroom social ecology is beneficial to practitioners, as it provides better understanding of the different factors associated with peer social dynamics that contribute to bullying relations.

The constructs considered here are all pieces of the same puzzle; however, past research had studied some of them at either the individual or the peer level, whereas to make more sense
of the data, research should aim to view these constructs together at the classroom level. Additionally, it is essential to explore the influence of popularity norms that govern classrooms and their influence on students with disabilities. Looking at a composite picture of all the factors that influenced classroom social dynamics will help researchers and teachers view classrooms as an environment of dynamic processes in which students are constantly interacting with the environment to create a classroom context. For a long time, researchers like Rodkin and Farmer had been advocating the need to view the classroom as a society that either supports or negates bullying and the conditions that give rise to it.
Chapter 3

Methodology

The Research Problem

The review of literature in Chapter 2 presented a range of factors that contribute to involvement in bullying relations, and highlighted the need to situate peer victimization within the context of classroom social dynamics. More specifically, the concept of norm salience helped to classify differential levels of classroom risk of or protection from involvement in the bullying process, as a victim, perpetrator, or both. Research in this area was particularly relevant to clarify the potential contributions of classroom peer ecology to the social difficulties and bullying involvement of students with disabilities.

The goal of the current study was to explore whether classroom norm salience was related to the social adaptation and peer victimization involvement of students with disabilities in late elementary school settings (fifth grade). Accordingly, this study was guided by four related research questions:

1. Can inclusive general education classrooms in the late elementary school years be classified in terms of norm salience?

2. Do the social roles, reputations, and social network placement of students with disabilities differ in classrooms as a function of distinct types of classroom norm salience?
(i.e., High Aggression Norm Salience classroom; High Academic/Prosocial Norm Salience classroom)?

3. Does the peer victimization involvement of students with disabilities differ by classroom norm salience type?

4. Do students with disabilities have different perceptions of classroom ecology by classroom norm salience type?

**Study Design**

The proposed study involved secondary data analysis of an extant dataset (Project REAL: Rural Early Adolescent Learning Program). The Project REAL dataset was particularly well suited to address the aims of this study, as the REAL study involved a large-scale cluster randomized trial of inclusive classrooms and a school ecology intervention program. As part of this research, baseline data were collected in the spring of students’ fifth-grade year, prior to the intervention year (sixth grade). Because the REAL project focused on social ecology, a broad range of peer relations and social dynamics data were collected. The proposed study used pre-intervention (baseline) data from a sample of 50 schools drawn from eight different regions of the United States: Far Western (n = 4), Midwestern (n = 4), Northern Plains (n = 4), Southwestern (n = 4), Southeastern (n = 6), Appalachian (n = 20), Pacific Northwest (n = 4) and Deep Southern (n = 4) (Hamm, Farmer, Lambert, & Gravelle, 2014). Seventy percent of these 50 schools were located in distant rural areas (National Center for Educational Statistics (NCES) local codes 41, 42, or 43); the others were located in remote towns (local codes 32 or 33).

**Student Participants**

All students in the fifth grade in the targeted schools were invited to participate in the study; in all, 2231 students consented to participate (53.1% female, n = 1184), for an average
participation rate of 57% (range of 6% to 100%) per classroom. The majority of the participants were White (61.5%), followed by 24.8% Black, 4.8% Hispanic, 3.7% American Indian, 1.2% Asian or other, and 4.2% unknown. Data on gender and race were collected from school records. The majority of the participants were in fifth grade (73.8%, n = 1646); 9% were in fourth grade (n = 200), 15.2% in sixth grade (n = 338), and 2.1% in seventh grade (n = 47). This is because, as these were rural schools, some fifth-grade classrooms also included students who were in the fourth, sixth, or seventh grade; they were included in the study as they were part of these classrooms and part of the classroom ecology. The sample included 115 students with disabilities: 51.3% Learning Disability (n = 59), 25.2% Speech Impairment (n = 22), 11.3% Other Health Impairments (n = 13), 9% Intellectual Disability, and 8.6% Autism, Emotional and Behavioral Disorder, Traumatic Brain Injury, or unspecified. These identification labels were gathered from school data.

Although Project REAL collected data on specific disability categories, the analyses dichotomized the data into two separate categories: students with disabilities and without disabilities. This was done for a number of reasons. First, students with disabilities comprised only a small percentage (n = 115, 5.15%) of the total sample of 2231 students; each disability category represented did not have enough power for sound statistical analysis, and there were large disparities in numbers between participants in the different disability categories. This variability may be representative of actual differences present within the data, but also indicates the preference of categorizing students into one disability category as opposed to another from school district to school district and state to state (Hallahan et al., 2007; Truscott, Catanese, & Abrams, 2005). Anecdotal reports by teachers participating in Project REAL indicated such variations in establishing disability criteria. For example, teachers in some schools indicated that
their school no longer used the EBD label; these students were instead identified for services under labels like LD or OHI, as students identified with these labels were less stigmatized than students identified as EBD. Thus, it would have been misleading to make specific inferences about specific disability categories based on this data set. However, behavioral characteristics in this data set did indicate that students with disabilities consistently differed from their non-disabled peers within the same classrooms. This data set was beneficial in providing an overview of social dynamics and peer relations of students with disabilities within mainstream classrooms, facilitating our understanding of the influence of norm salience on involvement in bullying relations among students with disabilities.

**Procedure**

The Institutional Review Board at Virginia Commonwealth University approved this study. Signed parental consent forms were required for students to participate. Student survey protocols were administered in a group setting in the school cafeteria; alternate seating was assigned to students to assure that no student was seated next to or near another student, to maintain confidentiality. The survey protocol was read aloud by a school administrator, and other assistants were present to help students individually or answer questions. Participants were assured that the information provided by them would be confidential and that they could withdraw from the study at any time. Students received school supplies as a reward for participating in the study. Students who had reading or spelling difficulties as identified by their teachers received individual or small-group administration of the survey in a different room, so as not to draw attention to the student (Farmer et al., 2012).

**Measures**
Peer behavioral assessments. Peer behavioral assessment is a tool used to measure classmates’ perception of their peers’ social and behavioral characteristics. Students are asked to nominate up to three peers for each of 18 behavioral descriptors: cooperative, athletic, starts fights, leader, cool, disruptive, good student, gets in trouble, shy, seeks help, popular, sad, friendly, bully, picked on, starts rumors, trendsetters and gets in their way. These items are identical or similar to those used in other research (e.g., Cantrell & Prinz, 1985; Coie et al., 1982; Masten, Morison, & Pellegrini, 1985; Farmer, Van Acker et al., 1999).

Each item on the measure was provided with the script that helped students understand the item/clarify its purpose. For example, Good Student reads “This person makes good grades, usually knows the right answer, and works hard in class.” (Appendix A includes blurbs for all 18 items). Students were instructed to nominate up to three classmates who best fit the respective behavior descriptors; they could leave a blank if they did not know any peers who matched a given item. Students could nominate the same individual(s) for multiple items, and they could nominate themselves too. Farmer and his colleagues (Farmer et al., 2002; Farmer et al., 1999) have established short-term (3 weeks) test–retest reliability for this tool ranging from $r = 0.72$ to $r = 0.93$. All 18 items were standardized by teacher ID (that is, by classroom), and the total score was tallied for each individual student. Following the procedure set by Estell et al. (2007), proportionate scores for each classroom were derived by dividing the potential number of nominators from the total number of nominations received; these proportionate scores were then multiplied by 1000 to clarify the differences (Rodkin et al., 2000).

The $z$-scores at the classroom level were calculated for each of the 18 variables. Previous studies have used and recommend the use of classrooms that have at least 50% participation rate for peer nomination measures (Farmer et al., 2009; Marks, Babcock, Cillessen, & Crick, 2013).
Thus, only classrooms that had 50% or higher participation rates were included in the final sample ($n = 1864$).

A factor analysis of these peer nomination variables yielded an aggression factor and a prosocial factor. The aggression factor consisted of four items; disruptive, starts fights, gets in trouble, and starts rumors (Cronbach’s $\alpha = .83$). The prosocial factor consisted of three items; cooperative, good student, and friendly (Cronbach’s $\alpha = .79$; Estell et al., 2007).

**Social cognitive mapping (SCM).** Social cognitive mapping is a procedure developed by Cairns and his team (Cairns & Cairns, 1991) to identify peer group membership and social network centrality among students. This procedure recruits students as expert observers of their classrooms, who are able to observe and report on peer groups that exist at their grade levels even if they are not part of those structures (Hamm, Schmid et al., 2011). SCM also operates on the principle that even if a particular student is not able to perfectly identify all the social groups present within the classroom, participants’ individual perceptions can be aggregated to present an overall view of social peer groups within the classroom. SCM uses a survey measure that requires students to respond to the question, “Are there some kids in your grade who hang around together a lot?” Students reported from free recall; they could report on all possible groups they could remember (i.e., they were not limited), could nominate individuals to multiple groups, and could nominate themselves into groups (Hamm, Lambert, Agger, & Farmer, 2013; Appendix B includes the measure). Since students were not privy to participation information, they were likely to nominate non-participants into groups; SCM calculations included non-participants, but they were excluded from data analysis (Hamm, Farmer, Dadisman, Gravelle, & Murray, 2011).
Project staff verified each student listed in any peer group in the class roster; any discrepancy between the class roster and peer nominations was verified with school personnel to ensure the roster was current and accurate. Students unknown to school personnel, not in the same grade level, or identified by first name only were excluded from the final data set (Hamm, Farmer et al., 2011).

Peer reports on SCM were then entered into the SCM software (SCM Version 4.0; Leung, 1996) to produce aggregate reports on all nominations and generate peer groups based on the nominations. The SCM output consisted of a composite list of members in each group, a list of total number of nominations for each student, and three matrices. The recall matrix was a visual representation of who nominated whom into each group. The co-occurrence matrix listed the frequency with which a particular student was nominated by other students in the grade. Students in the same group had higher levels of co-occurrence than non-member peers; thus, the matrix represented students in clusters based on groups ascertained by SCM. The correlation matrix represented the correlations between each individual student to the others in the class. Studies using SCM consider a correlation of \( r \geq .40 \) significant (Cairns, Perrin, & Cairns, 1985). To ensure reliability and validity, 50% participation rate within classrooms was considered the standard for using SCM; other classrooms were excluded. A three-week short coefficient of stability for this measure was high (\( \alpha = .90 \)), suggesting high short-term reliability. Finally, project staff analyzed the SCM output for each group and confirmed the SCM-determined groups as recommended by SCM procedures, also identifying outliers and dual group memberships. For the purpose of analysis, only primary group membership was considered, as students were more likely to interact in their primary groups (Hamm, Farmer et al., 2011; Hamm et al., 2010).
In addition to identifying peer groups within classrooms, information gathered from SCM was also used to assign a centrality index to every student (Farmer et al., 2011). That is, the number of individual nominations that each student received was measured against the index number (Chen et al., 2015). The frequency with which students were nominated into social groups was used to determine social network centrality. Each student was identified as a nuclear, secondary, peripheral, or isolate member within their social network; students who had more nominations were considered nuclear members, and students who were not nominated into any group were considered isolates.

**Bullying involvement subtypes.** The study used the bully and picked on variables to classify students into bullying involvement subtypes. This method has also been used by other studies using the same database to distinguish among bullies, victims, and bully-victims using peer nominations (e.g., Dawes et al., 2016; Estell et al., 2007; Schwartz, 2000; Vaillancourt et al., 2003). A .50 SD cutoff on the bully or picked on nomination was used to identify youth who were above average on bullying or victimization. Participants who had a z-score greater than .50 on the bully nomination by peers and a z-score of less than .50 on picked on nomination by peers were classified as bullies. Participants who had a z-score greater than .50 on the picked on and a z-score of less than .50 on the bullied nomination by peers were classified as victims. Participants who had a z-score greater than .50 on both picked on or bullied by peers were classified as bully-victims. Participants who had a z-score less than .50 on both measures were classified as not identified, because they did not fall into any of the three bullying-involvement categories.

**Peer perception of bullying.** The Protective Peer Ecology Scale-Middle School is a three-part scale developed by Song (2005) that measures peer protection, peer encouragement, and peer protection of bullying. Students’ responses were measured on a five-point Likert-type
scale ranging from never to always. The Peer Protector subscale has five items that assess the student’s inclination to protect others from bullying (e.g., “I would stick up for them” and “I would try to make the others stop bullying”). The Peer Protection subscale has 8 items that measure the extent to which students feel that peers would intervene if they themselves were being bullied (e.g., “My peers would tell others to stop the bullying,” and “My peers would talk to me to make me feel better”). The Peer Encouragement subscale has 5 items that measure the extent to which students feel that their peers would encourage the bully (e.g., “My peers would laugh”). Additionally, students responded to two additional questions on their experience with bullying; “How often have you been bullied since school started?” and “Did you stop the bullying from happening?” (Appendix C includes the complete measure).

**School Belonging.** The *Psychological Sense of School Membership-Brief* (PSSM-B) created by Hagborg (1998) was used to measure sense of school belonging. Students rated 11 items on a five-point Likert-type scale, in which 1 = completely false and 5 = completely true. Example of these items are “Other students like the way I am” and “I feel like a real part of my school.” To gain a composite score for each student, all the items were aggregated; high scores indicated a positive sense of school belonging. Cronbach’s alpha for this scale was .85. (Appendix D includes the complete measure.)

**Final Sample**

Of the 2231 students that consented to participate in the study, data were analyzed for classrooms that met the 50% participation criteria for the social cognitive mapping measures. Thus, the final sample consisted of 1863 (52.4% female, n = 976) students, distributed over 126 classrooms. The majority of the participants were White (61.5%, n = 1147), followed by 24.2%
Black ($n = 451$), 4.5% Hispanic, 4.3% American Indian, .3% Asian, or other and 5.4% unknown.
The sample included 5.25% ($n = 98$) students with disabilities.

**Analytical Plan**

Can inclusive general education classrooms in the late elementary school years be classified in terms of norm salience? The first step was to compute norm salience scores for each classroom, as the correlation between three peer-nominated behaviors (the aggression factor, prosocial factor, and academic variables) and peer-nominated popularity as used by Dijkstra and Gest (2015).

Using Mplus Version 7.3 (Muthén & Muthén, 1998–2012), latent profile analysis (LPA) was used to model the norm salience scores as indicators of latent classes of baseline risk (McCutcheon, 1987). For the purpose of this study, we needed to identify classroom types; thus, the teacher ID variable was used to identify latent classes. LPA uses person-centered latent variables to classify individuals into groups based on observed data (McCutcheon, 1987). The basic assumption of LPA is that underlying categorical variables can be used to characterize individuals into classes based on the observed data (Nylund, Asparouhov, & Muthén, 2007). LPA uses probability testing to estimate the possibility of class membership to group individuals, and employs multiple indices to access different aspect of model fit (Loehlin, 1998; Muthén & Muthén, 1998–2012). LPA is used to classify types of classrooms with distinct patterns of baseline risk that may be moderated by norm salience (e.g., popular-academic; popular-aggressive; popular-prosocial). To identify the best fitting model, the Akaike information criterion, Bayesian information criterion (BIC), and sample-size adjusted BIC values were used to identify a meaningful model. The Lo–Mendell–Rubin test result was taken into account to determine the significant improvement in fit before determining the number of class types.
**Hypothesis One.** Dijkstra and Gest (2015) identified two distinct clusters of classrooms based on norm salience. The first cluster had positive norm salience for academic and prosocial behavior and neutral norm salience for bullying; the second cluster of classrooms were characterized as negative for academic norm salience, neutral for prosocial norm salience, and positive for bullying norm salience. Based on past findings, this study hypothesized two distinct clusters of classrooms: one based on aggressive norm salience and the other based on academic norm salience.

Do the social roles, reputations, and social network placement of students with disabilities differ in classrooms as a function of distinct types of norm salience (i.e., high aggressive; high prosocial and academic)? To investigate the relation among variables, a correlation analysis was used. To test the ripple effect of classroom social dynamics, this study employed Hierarchical Linear Modeling (HLM) to test hypotheses using a two-level hierarchical structure, with students nested within classrooms. HLM allows analysis at both the individual and the classroom level with unbiased errors (Raudenbush & Bryk, 2002). The study explored persons within classrooms with a random intercept and fixed slopes. I predicted that disability status would influence social roles, reputations, and social network placement, after controlling for minority and gender. The social roles and reputations were peer-nominated behaviors and social network centrality. Individual HLM analysis was conducted from each of the peer-nominated behaviors. As social network centrality was a categorical variable, it was converted into binominals and the Hierarchical Generalized Linear Model (HGLM) was used to run analysis. The same dependent variables were entered at level 1, and at level 2 the intercept of level 1 was entered as the dependent variable ($\beta_0$) and the norm salience class type was entered as the independent variable.
Hypothesis Two. To test how the social roles of students with disabilities differ across classrooms as a function of the classrooms’ distinct types of norm salience, a two-level HLM model was tested, to account for the nested nature of the data (with students nested within classrooms). The model tested the interaction between disability status and norm salience class type on students’ peer roles and reputations.

At level 1, the peer-nominated roles/reputations (aggression, popularity, leader, etc.) were entered as dependent variables and gender (girls = 0, boys = 1), and minority ethnic status (0 = majority, 1 = minority) as control variables. Disability status was entered at as the independent variable (0 = non-disabled, 1 = disability). At level 2 the intercept of level 1 was entered as the dependent variable ($\beta_0$) and the norm salience class type was entered as the independent variable. Also at level 2, disability status from the level 1 model was entered as the dependent variable in the level 2 model ($\beta_3$), with class type as the independent variable. A significant coefficient for the level 2 independent variable (class type) was provided as a test for the cross-level interaction effect of class type and disability status on students’ peer roles/reputations, controlling for gender and minority status. To test the difference in social network placement of students with disabilities by classroom type, HGLM analysis was used. However, at level 1, the peer-nominated variables *nuclear, secondary, peripheral and isolate* were entered as binominal variables (where 1= nuclear and 0 = not a nuclear) for the dependent variables, and four separate analyses were run to cover each of them. The equation for Hypothesis Two was:

**Level 1:** (Peer-Nom Roles/Reputation/ Social Network Placement) = $\beta_0 + \beta_1$

(Gender$_{ij}$) + $\beta_2$ (Minority$_{ij}$) + $\beta_3$ (Disability Status$_{ij}$) + $e_{ij}$

**Level 2:** $\beta_0 = \gamma_{00} + \gamma_{01}$ (Class Type) + $\mu_0$

$\beta_3 = \gamma_{30} + \gamma_{31}$ (Class Type)
Does the peer victimization involvement of students with disabilities differ by classroom norm salience type?

**Hypothesis Three.** To test the difference in peer victimization involvement of students with disabilities by classroom type, HGLM analysis was used. However, at level 1, the peer-nominated variables *bully, victim, bully-victim,* and *not involved* were entered as binominal variables (where 1= bully and 0 = not a bully) were entered as the dependent variables, and four separate analyses were run to cover each of them. The equation for Hypothesis Three was:

Level 1: \((\text{Bully/Victim/Bully-Victim/Not Involved}) = \beta_0 + \beta_1 (\text{Gender}_{ij}) + \beta_2 \text{(Minority}_{ij}) + \beta_3 \text{(Disability Status}_{ij}) + e_{ij}\)

Level 2: \(\beta_0 = y_{00} + y_{01} \text{(Class Type)} + \mu_0 \)
\(\beta_3 = y_{30} + y_{31} \text{(Class Type)}\)

Do students with disabilities have different perceptions of the classroom ecology by classroom norm salience type?

**Hypothesis Four.** HLM analysis was used to test how perceptions of the classroom ecology among students with disabilities differed across classrooms as a function of distinct types of norm salience. In this case, the dependent variable at level 1 was the perception of classroom ecology, with the same three control variables (gender, minority).

The equation for Hypothesis Four was:

Level 1: \((\text{Perception of Classroom Ecology}) = \beta_0 + \beta_1 (\text{Gender}_{ij}) + \beta_2 \text{(Minority}_{ij}) + \beta_3 \text{(Disability Status}_{ij}) + e_{ij}\)

Level 2: \(\beta_0 = y_{00} + y_{01} \text{(Class Type)} + \mu_0 \)
\(\beta_3 = y_{30} + y_{31} \text{(Class Type)}\)
Chapter 4

Results

The overarching goal of this study was to examine possible linkages between the collective culture of the classroom and the school adjustment of students with disabilities. More specifically, the primary aims were to explore potential differences in the social roles and reputations of students with disabilities, their involvement in peer victimization, and their perceptions of the classroom ecology in classrooms with different types of norm salience (i.e., aggressive, academic, and prosocial).

To do this, this study followed a systematic process moving from the identification of different classroom types to the examination of students’ experiences in these different classrooms. First, Latent Profile Analysis (LPA) was used to identify classroom types based on the norm salience of (i.e., the extent to which popular youth engage in) aggressive behavior, academic competence, and prosocial behavior. LPA allows for the identification of mutually exclusive latent classes (McCutcheon, 1987). Next, Hierarchical Linear Modeling (HLM) and Hierarchical Generalized Linear Modeling (HGLM) were used to assess whether the social roles and reputations, social network centrality, involvement in peer victimization, perceptions of the classroom ecology, and feelings of school belonging of students with disabilities differed by
classroom type. Analyses performed in HLM account for the nested nature of the data (i.e., students in classrooms; Raudenbush & Bryk, 2002).

Research Question 1: Can Inclusive General Education Classrooms in The Late Elementary School Years Be Classified in Terms of Norm Salience?

To address this question, Latent Profile Analysis (LPA) using Mplus Version 6.1 (Muthén & Muthén, 1998–2012) was employed to identify classroom types depending on the popularity norm salience for different behaviors. Popularity norm saliences for aggressive behavior, academic behavior, and prosocial behavior were used as latent indicators to identify classroom types (McCutcheon, 1987). Distinct from Latent Class Analysis (LCA), which identifies latent classes from categorical variables, LPA identifies latent classes from continuous observed variables (McCutcheon, 1987). Using LPA’s probabilistic, model-based method, classrooms were categorized into latent classes based on their highest posterior probability (Dijkstra and Gest, 2015). Based on prior research differentiating classrooms by norm salience, I expected to find two types of classrooms. To test this hypothesis, I ran a series of models testing between two and six classes to identify the model with the best fit.

Several indices were used to assess model fit (Muthén & Muthén, 1998–2012). The Akaike information criterion (AIC), Bayesian information criterion (BIC), and adjusted BIC were each used. Lower AIC, BIC, and adjusted BIC values represent a better-fitting model. Comparing fit indices across classes, the BIC value for model two (104.600) was less than that for model three (106.575), suggesting that the two class model fit the data better than the three class model. However, the AIC value for model three (66.867) was less than the AIC model for value two (76.23), indicating a difference in fit model. The Lo–Mendell–Rubin likelihood test was also used to identify the best model fit by comparing models $k$ versus $k-1$, where a
significant \( p \)-value would indicate that model \( k \) had improved fit over model \( k-1 \) (Nylund et al., 2007). The Lo–Mendell–Rubin test on the two class model indicated a significant improvement in fit over the one class model \( (p < .001) \), but the results for the three class model \( (p = 0.309) \) were not significant and did not show an improvement over the two class model. Thus, after considering all the related indices for a fit model, I concluded that a two class model fit the data best, yielding two types of classrooms. One classroom type had high popularity norm salience for aggressive behavior but low popularity norm salience for academic and prosocial behavior \((n = 45; \text{henceforth referred to as High Aggression Norm Salience})\); the second classroom type had low popularity norm salience for aggression and high norm salience for academic behavior and prosocial behaviors \((n = 81; \text{henceforth referred to as High Academic/Prosocial Norm Salience})\). The results of fit indices for each model test between one and six classes are listed in Table 1.

Table 1

| Model Fit Indices for Latent Profile Analyses Specifying One to Six Latent Classes |
|---------------------------------|---------|---------|---------|---------|---------|
|                                | LLR     | AIC     | BIC     | Adjusted BIC | ALMR    |
| 1 Class                        | -83.344 | 178.688 | 195.706 | 176.732 | -----   |
| 2 Classes                      | **-28.119** | **76.23** | **104.600** | **72.977** | 105.022*** |
| 3 Classes                      | -19.433 | 66.867  | 106.575 | 62.302  | 16.517   |
| 4 Classes                      | -13.271 | 62.541  | 113.594 | 56.673  | 11.720   |
| 5 Classes                      | -8.390  | 60.780  | 123.178 | 53.607  | 9.282    |
| 6 Classes                      | -2.340  | 56.680  | 130.423 | 48.203  | 11.505***|

*Note. \( N = 126. \) LLR = Log likelihood ratio, AIC = Akaike information criterion; BIC = Bayesian information criterion; and ALMR = adjusted Lo–Mendell–Rubin likelihood ratio test. For each of the indices, the bold values indicate the most parsimonious solution. *** \( p < .001. \)
Research Question 2: Do the Social Roles, Reputations, and Social Network Placement of Students with Disabilities Differ in Classrooms as a Function of Distinct Types of Classrooms based on Norm Salience (i.e., High Aggression Norm Salience classroom, High Academic/Prosocial Norm Salience classroom)?

Hierarchical Linear Modeling (HLM) software was used to conduct a two-level model with students nested within fifth-grade classrooms. Analyses were conducted to compare differences in peer-nominated roles and reputations depending on disability status (level 1) and class type (level 2). I expected a significant interaction between disability status and class type on the following 16 continuous dependent variables: peer nominations for friendly, cooperative, disruptive, shy, starts fights, seeks help, leader, athletic, gets in trouble, good student, cool, sad, starts rumors, popular, trendsetter, and gets their way. Interclass correlation coefficients (ICCs) were calculated for each dependent variable to separate the total variance between level 1 (individual) and level 2 (classroom). The unconditional model yielded an ICC of .00, indicating no variance between classrooms for any of the above-mentioned sixteen dependent variables. Given that peer nominations were standardized by classroom following standard peer-nomination procedures to allow for comparisons across different classrooms of different sizes, the lack of significant variance across classrooms for peer nominations was expected (e.g., Estell et al., 2009; Farmer, Van Acker et al., 1999). Despite the lack of significance, I continued to conduct analyses in HLM given the nested structure of the data.

I conducted two separate models for each dependent variable, using a two-level hierarchical linear model. For both models, I controlled for gender (0 = girls, 1 = boys) and ethnic minority status (0 = majority, 1 = minority) at the individual level (level 1). In the first
model, I tested for the main effect of disability status and class type: the independent variable at level 1 was disability status (0 = student without disability, 1= student with a disability) and the independent variable at level 2 was Class Type (0 = High Academic/Prosocial Norm Salience classroom, 1 = High Aggression Norm Salience classroom). Each peer-nominated variable was entered as a dependent variable. To test my hypotheses, in the second model I tested for the cross-level interaction between class type at level 2 and disability status at level 1.

**Roles and reputations.** Students with disabilities were more likely to be nominated as being shy, seeking help, and being sad compared to students without disabilities ($\beta$s > 0.541, $SE$s < 0.11, $p$s < .001). Further, students with disabilities were less likely to be nominated as leaders, popular, athletic, good student, or cooperative compared to students without disabilities ($\beta$s > -0.419, $SE$s < 0.06, $p$s < .01). There was also a trend for students with disabilities to be nominated less as trendsetters and cool ($\beta$s > -0.178, $SE$s < 0.091, $p$s < .081) compared to students without disabilities. Students with disabilities did not differ from students without disabilities on nominations for gets in trouble, starting rumors, disruptive, fighting, gets their way, and friendly ($\beta$s > 0.0163, $SE$s < 0.088, $p$s > .05).

The results of the second set of HLM analyses, testing the cross-level interaction of disability status and class type for each of the roles and reputations (dependent variables), are listed in Table 2. They reveal a significant cross-level interaction between disability status and class type for peer nominations for gets their way ($\beta$ = .384, $SE$ = .18, $p$ = .03). A plot was created to compare peer nominations of gets their way for students with and without disabilities in both classroom types (Figure 1). According to a simple slope test, students with disabilities are more likely to be nominated by peers as getting their way when they are in classrooms with high aggressive norm salience ($t = 0.36, p = .014$). There was no difference by class type in
nominations for *gets their way* for students without disabilities (*t* = -0.03, *p* = 0.523). The cross-level interaction between disability status and class type was also significant for peer nominations of *leader* (*β* = .271, *SE* = .13, *p* = .032). According to a simple slope test, there was a trend for students with disabilities to be more likely to be nominated by peers as *leaders* when they were in classrooms with high aggressive norm salience (*t* = 0.26, *p* = .067; see Figure 2).

There was no difference in nominations for *leader* for students without disabilities by class type (*t* = -0.006, *p* = .888). All other cross-level interactions between disability status and class type for any other peer nominations on roles and reputations were nonsignificant (*β*s <.27, *SE*s >.15, *p*s > .144). This indicated that these other roles and reputations of students with disabilities did not differ as a function of class type whether popularity norm salience was high in aggressive or in academic and prosocial behavior.

Effect sizes for each of the significant variables were computed using the formula recommended by McCoach (2010) which can be considered an equivalent to Cohen’s *d*.

$$\delta = \frac{\gamma_{01}}{\sqrt{\sigma^2 + \tau_{00}}}$$

This formula uses the values from the unconditional model that divides the total variance in the dependent variable into two parts: \(\sigma^2\) represents the between-cluster variance and \(\gamma_{01}\) the within-cluster variance. I calculated the difference between the two groups for the variables that were significant at level 1 (disability status), as well as those significant at level 2 (interaction: class type by disability status). At level 1, there was a significant main effect of disability status for nine dependent variables, each indicating a significant difference between students with and without disabilities. The effect sizes for *cooperative* (\(\delta = 0.29\)), *shy* (\(\delta = 0.27\)), *cool* (\(\delta = 0.18\)) and *popular* (\(\delta = 0.26\)) were lower than .30 indicating a small difference between groups. There were medium effect sizes for differences in students with and without disabilities on *seeks help*.
(δ = 0.56), leader (δ = 0.34) good student (δ = 0.40), and sad (δ = 0.32), as they all ranged from .30 to .70. Athletic (δ = 0.78) was the only peer-nominated variable that had a large effect size.

Testing the effect sizes of the significant cross-level interactions, there was a medium effect size for differences among students with disabilities’ nominations for gets their way (δ = 0.38) depending on classroom type and a low effect size for differences among students with disabilities’ nominations for leader (δ = 0.27) (see Figure 1).
## Table 2

Hierarchical Linear Modeling Parameter Estimates for Peer-Nominated Roles and Reputations

<table>
<thead>
<tr>
<th></th>
<th>Friendly</th>
<th>Cooperative</th>
<th>Disruptive</th>
<th>Shy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.47 (.03)***</td>
<td>0.47 (.03)***</td>
<td>-0.16 (.03)***</td>
<td>0.27 (.12)*</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.49 (.04)***</td>
<td>-0.49 (.04)***</td>
<td>0.22 (.05)***</td>
<td>0.18 (.03)***</td>
</tr>
<tr>
<td>Minority</td>
<td>-0.10 (.04)**</td>
<td>-0.10 (.04)**</td>
<td>0.19 (.04)***</td>
<td>-0.33 (.05)***</td>
</tr>
<tr>
<td>Disability</td>
<td>-0.16 (.10)</td>
<td>-0.17 (.10)</td>
<td>-0.07 (.10)</td>
<td>-0.12 (.12)</td>
</tr>
<tr>
<td>Class Type</td>
<td>-0.00 (.03)</td>
<td>-0.01 (.03)</td>
<td>-0.00 (.03)</td>
<td>-0.01 (.03)</td>
</tr>
<tr>
<td>Minority*Disability</td>
<td>0.03 (.21)</td>
<td>0.03 (.18)</td>
<td>0.03 (.18)</td>
<td>-0.11 (.23)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Starts Fights</th>
<th>Seeks Help</th>
<th>Leader</th>
<th>Athletic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.34 (.03)***</td>
<td>0.19 (.03)***</td>
<td>-0.16 (.03)***</td>
<td>-0.15 (.03)***</td>
</tr>
<tr>
<td>Gender</td>
<td>0.50 (.04)***</td>
<td>0.20 (.05)***</td>
<td>-0.16 (.05)**</td>
<td>0.46 (.05)***</td>
</tr>
<tr>
<td>Minority</td>
<td>0.21 (.40)***</td>
<td>0.07 (.04)†</td>
<td>0.06 (.04)</td>
<td>0.13 (.04)***</td>
</tr>
<tr>
<td>Disability</td>
<td>0.00 (.09)</td>
<td>0.54 (.13)***</td>
<td>-0.35 (.07)***</td>
<td>-0.44 (.08)***</td>
</tr>
<tr>
<td>Class Type</td>
<td>-0.02 (.03)</td>
<td>-0.06 (.03)*</td>
<td>0.01 (0.03)</td>
<td>-0.04 (.03)</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>0.16 (.21)</td>
<td>-0.24 (.27)†</td>
<td>0.23 (.13)†</td>
<td>0.05 (.16)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Gets in Trouble</th>
<th>Good Student</th>
<th>Cool</th>
<th>Sad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.36 (.02)***</td>
<td>0.33 (.03)***</td>
<td>0.03 (0.03)</td>
<td>0.18 (.03)***</td>
</tr>
<tr>
<td>Gender</td>
<td>0.61 (.04)***</td>
<td>-0.30 (.05)***</td>
<td>0.10 (.04)*</td>
<td>-0.25 (.05)**</td>
</tr>
<tr>
<td>Minority</td>
<td>0.18 (.04)***</td>
<td>-0.07 (.04)*</td>
<td>0.16 (.04)***</td>
<td>-0.11 (.04)*</td>
</tr>
<tr>
<td>Disability</td>
<td>0.10 (.10)</td>
<td>-0.42 (.07)***</td>
<td>-0.18 (.10)†</td>
<td>-0.21 (.11)</td>
</tr>
<tr>
<td>Class Type</td>
<td>-0.02 (.03)</td>
<td>0.02 (.03)</td>
<td>-0.06 (.03)*</td>
<td>-0.07 (.03)*</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>0.19 (.21)</td>
<td>0.08 (.15)</td>
<td>0.03 (.03)</td>
<td>0.09 (.19)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Starts Rumors</th>
<th>Popular</th>
<th>Trend Setter</th>
<th>Gets Their Way</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.02 (.03)***</td>
<td>0.15 (.03)***</td>
<td>0.24 (.03)***</td>
<td>0.23 (.03)***</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.20 (.04)***</td>
<td>-0.07 (.05)</td>
<td>-0.33 (.05)***</td>
<td>-0.36 (.04)***</td>
</tr>
<tr>
<td>Minority</td>
<td>0.23 (.04)***</td>
<td>0.12 (.04)***</td>
<td>0.12 (.04)***</td>
<td>0.10 (.04)*</td>
</tr>
<tr>
<td>Disability</td>
<td>-0.06 (.09)</td>
<td>-0.27 (.09)***</td>
<td>-0.16 (.09)†</td>
<td>-0.07 (.14)</td>
</tr>
<tr>
<td>Class Type</td>
<td>0.014 (.03)</td>
<td>-0.07 (.03)*</td>
<td>-0.03 (.03)</td>
<td>-0.02 (.03)</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>0.05 (.19)</td>
<td>-0.07 (.17)</td>
<td>-0.24 (.16)</td>
<td>0.36 (.18)*</td>
</tr>
</tbody>
</table>

Note. Gender reference group 0 = girls. Minority reference group = majority/White ethnic status. Level 1 variables = gender, minority, disability. Level 2 variable = class type.  
*p < .05. **p < .01. ***p < .001.
Social network centrality. Next, I tested whether there were differences in students’ social network centrality (derived from the Social Cognitive Mapping measure) by disability status and class type. Using established procedures to identify students’ social network centrality, students were categorized into four distinct groups: nuclear centrality, secondary centrality, peripheral centrality, and isolates. Membership at each level was converted into a binary
dependent variable to test the likelihood that students with disabilities in different classroom types would have a given centrality status. For example, to test for nuclear centrality, I created a binary outcome variable where “1” equaled nuclear centrality and “0” equaled any of the other centrality groups. Given the dichotomous outcome variables, I conducted a series of four HGLM analyses. ICC calculations for each of the four binary outcome variables were calculated in order to separate the total variable between level 1 and level 2. HGLM analyses do not estimate the level 1 variance; hence, per the recommendation of Snijders and Bosker (2012), level 1 variance is assigned a value of $\pi^{2/3}$ in order to calculate ICCs. The ICCs for nuclear, secondary, and peripheral centrality indicated significant variance between classrooms: the unconditional model for nuclear centrality yielded an ICC of .19, indicating a 19% variance between classrooms, variance component $= .077, \chi^2 (118) = 375.72, p < .001$. The ICC for secondary centrality was .11, indicating 11% variance between classrooms, variance component $= .404, \chi^2 (118) = 271.63, p < .001$. The ICC for peripheral centrality was .14, indicating 14% variance between classrooms, variance component $= .557, \chi^2 (118) = 200.62, p < .001$. Finally, the ICC for isolate status indicated 9% variance between classrooms; however, the variance component was not significant, indicating no significant difference between classrooms in students’ isolate status (variance component $= .307, \chi^2 (118) = 136.66, p = .115$).

As with the analyses of differences in students’ social roles and reputations, I conducted two separate models for each binary dependent variable, using a two-level hierarchical generalized linear model. All models controlled for gender and ethnic status at the individual level (level 1). The first model tested for the main effect of disability status (level 1) and class type (level 2), and the second model tested the cross-level interaction between disability status
and class type in order to test my hypothesis that students with disabilities would have different social network centrality depending on their classroom norm salience type.

Table 3 summarizes the results of the HGLM for social network centrality. Students with disabilities were more likely to have isolate status ($\beta s > 1.080, SEs < 0.33, p = .001$) and less likely to have nuclear centrality ($\beta s > -0.58, SEs < 0.23, p = .016$) than students without disabilities. There was no difference between students with disabilities and students without disabilities on secondary and peripheral social network centrality ($\beta s > .162, SEs < 0.23, p > .05$), and no significant cross-level interactions between disability status and class type ($\beta s > .75, SEs < 0.48, p > .05$).

The results of the HGLM outputs were defined in terms of the probability of the outcome variable (i.e., they indicated the likelihood of students with disabilities being nominated as isolate or nuclear as compared to their non-disabled peers). The results of the HGLM model do not support direct interpretation of the coefficient values, as the results are reported in terms of log-odds transformations of the outcome variable. Thus, in order to interpret the coefficients, the predicted outcome score must be reverse-transformed (see Brown, Herman, Hamm, & Heck, 2008; Dawes et al., 2016). To interpret the magnitude of the effects for significant differences in nuclear and isolate centrality status, I calculated two predicted outcome scores: first, a predicted outcome score based on the intercept, which signifies the likelihood of having nuclear centrality or isolate status for a student without disabilities; and two, the predicted outcome score for the sum of the intercept and the disability coefficient, which denotes the likelihood of a student with disabilities having nuclear centrality or isolate status. The final step was to undo the effects of the log-odds by converting the predicted outcomes scores to probabilities. The resulting probabilities represent the difference between the likelihood a student without a disability would
have nuclear centrality or isolate status and the likelihood that a student with a disability would have nuclear centrality or isolate status. The predicted outcome for nuclear centrality for students without disabilities was the student-level intercept, \( y = 0.08 \). The log-odds probability is represented by the equation \( y = \log (p/ (1-p)) \). Using \( p = 1 / (1+e^{-y}) \), I converted the log-odds into the predicted probability for \( y = 0.08 \); the result indicated that, holding all predictors constant, the predicted probability that a student without disabilities would be nominated as a nuclear member of a group was .52. The corresponding coefficient for disability status was -0.57.

The sum of the intercept and the disability coefficient as \( y = 0.08 + -0.57 = -0.49 \). Using the same formula to convert the log-odds probability value, \( p = 1 / (1+e^{-y}) \), yielded a predicted probability value of .38. The results indicate that holding all other predictors constant, the odds that a student with a disability would have nuclear status was .38. Thus, the probability of having nuclear status decreases from .52 to .38 for students with disabilities.

There was also a significant association between disability status and isolate status. Using the same steps that were used to calculate the predicted probability for nuclear centrality status, I computed the predicted probability that a student with disabilities would have isolate status. The predicted outcome for isolate centrality for students without disabilities was the student-level intercept of \( y = -2.97 \), which I converted to a predicted probability using the above-mentioned equation. Holding all predictors constant, the predicted probability that a student without a disability would be nominated as an isolate was .05. There was a significant difference between students with disabilities and their non-disabled peers, with a coefficient value of -1.08. The sum of the student-level intercept and the coefficient for the disability predictor variable was \( y = -2.97 + 1.08 = -1.89 \). Using the same formula, \( p = 1 / (1+e^{-y}) \), to convert the log-odds probability
value, I got a predicted probability value of .13. Thus, the probability that a student with a disability would be socially isolated increased significantly, from .05 to .13.

Using the same approach, I calculated effect sizes for nuclear and isolate variables. The effect size for nuclear centrality ($\delta = 0.28$) indicated only a small effect of disability status. The isolate variable had an effect size of $\delta = 0.56$, indicating a medium effect of disability status.
Table 3

Hierarchical Generalized Linear Modeling Parameter Estimates for Social Network Centrality

<table>
<thead>
<tr>
<th></th>
<th>Nuclear</th>
<th>Secondary</th>
<th>Peripheral</th>
<th>Isolate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$ ($SE$)</td>
<td>$\beta$ ($SE$)</td>
<td>$\beta$ ($SE$)</td>
<td>$\beta$ ($SE$)</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.08 (.12)</td>
<td>0.07 (.12)</td>
<td>-0.50 (.11)**</td>
<td>-0.51 (.11)**</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.22 (.11)</td>
<td>-0.22 (.11)*</td>
<td>-0.09 (.11)</td>
<td>-0.09 (.12)</td>
</tr>
<tr>
<td>Minority</td>
<td>-0.02 (.15)</td>
<td>-0.013 (.15)</td>
<td>0.06 (.14)</td>
<td>0.06 (.15)</td>
</tr>
<tr>
<td>Disability</td>
<td>-0.57 (.23)*</td>
<td>-0.44 (.31)</td>
<td>0.16 (.23)</td>
<td>0.29 (.29)</td>
</tr>
<tr>
<td>Class Type</td>
<td>-0.09 (.17)</td>
<td>-0.07 (.17)</td>
<td>-0.04 (.15)*</td>
<td>-0.02 (.15)</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>-0.35 (.49)</td>
<td>-0.32 (.48)</td>
<td>0.57 (.60)</td>
<td>0.74 (.65)</td>
</tr>
</tbody>
</table>

Note. Gender reference group 0 = girls. Minority reference group = majority/White ethnic status. Level 1 variables = gender, minority, disability. Level 2 variable = class type.

*p < .05. **p < .01. ***p < .001.
Research Question 3: Does the Peer Victimization Involvement of Students with Disabilities Differ by Classroom Norm Salience Type?

The third objective of the study was to identify differences in bullying involvement among students with disabilities by classroom type. The bully and picked on variables were converted into four categories using the 0.5 SD cutoff (see Chapter 3). Using both variables, four groups of students were identified: bully, bully-victim, victim, and not involved. To test whether students with disabilities in different classroom types differed in their bullying involvement, I created four binary outcome variables using the same method I used to create social network centrality. For example, to test for bullying involvement, I created a binary outcome variable where “1” equaled “bully” and “0” equaled “other” (victim, bully-victim, or not involved). Given the dichotomous outcome variables, I conducted a series of four Hierarchical Generalized Linear Modeling (HGLM) analyses. I expected a significant interaction between disability status and class type on bullying involvement. I conducted two separate analyses for each dependent variable using two-level hierarchical generalized linear models, employing the same method used for social network centrality. Prior to computing the HGLM analysis, the ICCs were less than .00 for the bully, bully-victim, and victim variables, indicating no variance between classrooms on each of these. The not involved variable yielded an ICC of .01, indicating a 1% variance between classrooms, but the variance component was not significant: variance component = .049 \chi^2(125) = 147.12, p = .086.

The results are reported in Table 4. Students with disabilities were more likely to be nominated as victims as compared to students without disabilities (\beta > .767, SEs < 0.24, ps < .002) and were less likely to be non-involved compared to students without disabilities (\beta = -.58,
$SE = .24, p = .013$). Students with disabilities did not differ from students without disabilities on bully and bully-victim status ($\beta$s $> 0.310$, $SE$s $< .291$, $ps < .543$).

As this was an HGLM analysis, I used the same method to calculate the predicted probabilities to understand the likelihood that a student with a disability would be a victim or not involved in peer victimization. First, I computed the probability odds for the victim-involvement subtype by using the student-level intercept of $y = -1.84$. The result indicated that, holding all predictors constant, the predicted probability that a student without a disability would be a victim was .14. There was a significant difference between students with disabilities and their non-disabled peers, with a coefficient value of 0.77. The sum of the student-level intercept and the disability-level intercept was $y = -1.84 + 0.77 = -1.07$. Using the same formula, $p = 1 / (1+e^{-y})$, to convert the log-odds probability value, I got a predicted probability value of .25. These results indicate that the probability that a student with disability status would be a victim increased from .14 (for students without disabilities) to .25.

I proceeded with the same method to compute the predicted probability that a student with a disability would be not involved. The student-level intercept for the not involved variable was $y = 1.50$. Holding all predictors constant, the predicted probability of students without disabilities being uninvolved in bullying was .82. The sum of the student-level intercept and the disability-level intercept was $y = 1.50 + -0.58 = .92$. Using the same formula, $p = 1 / (1+e^{-y})$, to convert the log-odds probability value, I got a predicted probability value of .71. This indicates that the odds that a student with a disability would be uninvolved in bullying decreased from .82 (for students without disabilities) to .71. In other words, it means that students with disabilities are more likely than other students to be involved in bullying relations.
The results for the second set of HLM analyses, testing the cross-level interaction of disability status and class type for each of the dependent variables are also listed in Table 4. Results indicated no significant cross-level interaction between disability status and classroom type for any of the four peer victimization involvement variables (βs > .29, SEs < .45, ps > .535).
### Table 4

Hierarchical Generalized Linear Modeling Parameter Estimates for Bullying Involvement Subtypes

<table>
<thead>
<tr>
<th></th>
<th>Bully</th>
<th>Bully-Victim</th>
<th>Victim</th>
<th>Not Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-3.21 (.17)***</td>
<td>-3.21 (.17)***</td>
<td>-4.15 (.30)***</td>
<td>-1.84 (.12)***</td>
</tr>
<tr>
<td>Gender</td>
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<td>1.52 (.18)***</td>
<td>1.23 (.31)***</td>
<td>0.24 (.14)</td>
</tr>
<tr>
<td>Minority</td>
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<td>0.54 (.17)**</td>
<td>0.23 (.27)</td>
<td>0.04 (.14)</td>
</tr>
<tr>
<td>Disability</td>
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<td>-0.09 (.36)</td>
<td>0.31 (.51)</td>
<td>0.77 (.25)***</td>
</tr>
<tr>
<td>Class Type</td>
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<td>0.20 (.14)</td>
<td>-0.64 (.28)*</td>
<td>0.02 (.12)</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>-0.07 (.58)</td>
<td>-0.31 (1.2)</td>
<td>0.29 (.47)</td>
<td>-0.20 (.45)</td>
</tr>
</tbody>
</table>

**Note.** Gender reference group 0 = girls. Minority reference group = majority/White ethnic status. Level 1 variables = gender, minority, disability. Level 2 variable = class type.

* *p < .05. ** *p < .01. *** *p < .001.
Research Question 4: Do Students with Disabilities Have Different Perceptions of the Classroom Ecology by Classroom Norm Salience Type?

The fourth aim of the study was to identify differences in perceptions of classroom ecology among students with disabilities by classroom type. The three measures of perceptions of peer ecology (peer protector, peer protection, and peer encouragement) and the school belonging variable were used as dependent variables. HLM analysis was conducted, given the nested nature of the data and the continuous outcome variables. I expected a significant interaction between disability status and class type on the perception of classroom ecology. ICCs were calculated for all four variables: peer protector, peer protection, peer encouragement, and school belonging. There was significant variance at the classroom level (level 2) in three of the four variables. Peer protector yielded an ICC of .08, indicating 8% of variance between classrooms, variance component = .079, $\chi^2 (105) = 231.02$, $p = .000$. The ICC for peer protection was .02, indicating 2% variance between classrooms, variance component = .0271, $\chi^2 (105) = 141.91$, $p = .010$. The school belonging variable yielded an ICC of .05, indicating a 5% variance between classrooms, variance component = .0308, $\chi^2 (125) = 222.50$, $p = .000$. These ICCs indicated significant differences by classroom in students’ willingness to protect peers being bullied, their expectations for peer protection from bullying, and their sense of school belonging.

The results of the main effects and cross-level interactions between class type at level 2 and disability status at level 1 on the dependent variables are presented in Table 5. Main effect analyses revealed that students with disabilities were more likely to perceive greater peer encouragement for bullying against them compared to students without disabilities ($\beta = .251$, $SE = .111$, $p = 0.025$). There was no difference between students with disabilities and their non-
disabled peers on peer protector, peer protection, and school belonging variables (βs > 0.0287, SEs < .080, ps < .510).

In line with my expectations, there was a significant cross-level interaction between disability status and class type for school belonging (β = -.39, SE = .15, p = .01). A plot was created to compare school belonging of students with and without disabilities in both classroom types (Figure 3). According to a simple slope test, students with disabilities had lower levels of school belonging when they were in classrooms with High Aggression Norm Salience as compared to students with disabilities in classrooms with High Academic/Prosocial Norm Salience (t = -0.387, p = .008); there was no difference in school belonging for students without disabilities by class type (t = .002, p = .970). As there was a significant interaction for the school belonging variable, I calculated the effect size using the same formula that I had used in previous analyses. The results indicated a medium effect size for differences in school belonging depending on disability status and class type (δ = 0.50).
Table 5

Hierarchical Linear Modeling Parameter Estimates for School Belonging and Perception of Peer Ecology

<table>
<thead>
<tr>
<th></th>
<th>Peer Protector</th>
<th>Peer Protection</th>
<th>PeerEncourage</th>
<th>School Belonging</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>β (SE)</td>
<td>β (SE)</td>
<td>β (SE)</td>
</tr>
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<td>-0.44 (.06)***</td>
</tr>
<tr>
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<td>-0.35 (.05)***</td>
<td>-0.04 (.06)</td>
<td>-0.04 (.06)</td>
</tr>
<tr>
<td>Disability</td>
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<td>0.02 (.12)</td>
<td>-0.02 (.12)</td>
<td>0.02 (.14)</td>
</tr>
<tr>
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<td>-0.03 (.07)</td>
<td>0.01 (.07)</td>
<td>0.02 (.07)</td>
</tr>
<tr>
<td>Class Type*Disability</td>
<td>-0.27 (.20)</td>
<td>-0.12 (.23)</td>
<td>-0.56 (.22)</td>
<td>-0.39 (.15)**</td>
</tr>
</tbody>
</table>

Note. Gender reference group 0 = girls. Minority reference group = majority/White ethnic status. Level 1 variables = gender, minority, disability. Level 2 variable = class type. *p < .05. **p < .01. ***p < .001.
Figure 3. Comparing students with disabilities to their non-disabled peers on *school belonging* by classroom norm salience type.
Chapter 5

Discussion

This study has been a step towards understanding the classroom as a society (Ahn & Rodkin, 2014). In this view, students’ characteristics contribute to the collective peer ecology, which in turn contributes to individual students’ characteristics and relationships. Thus, through the lens of social dynamics, students are both product and process of the peer ecology (Bronfrenbrenner, 1943; Farmer, 2007). There is substantial evidence that students with disabilities experience social difficulties within the classroom (Evans & Eder, 1993; Meadan & Monda-Amaya, 2008; Nowicki, 2003; Siperstein et al., 2007). The current study aims to explore the relationship between classroom social dynamics and the social relations of students with disabilities.

Although the classroom society is multifaceted and can be conceptualized in diverse ways, the present study focuses on a specific indicator of the classroom peer ecology: norm salience. I used popularity norms as a yardstick to understand the social adjustment of students with disabilities in general education classrooms. In more detail, I explored social roles and
reputation, network centrality, bullying involvement, and school belonging of students with disabilities within classrooms with distinct types of norm salience.

As previously reviewed, norm salience can be distinguished from two other forms of norms: descriptive and injunctive. Descriptive norms reflect the mean level of a characteristic of interest in the classroom and are operationalized by calculating the class average for a measure of that characteristic. Injunctive norms reflect perceived social values, which if not adhered to may result in social repercussions, and which are operationalized by asking students how their close associates would respond if they were to behave in a certain way (Dijkstra & Gest, 2015; Hamm, Schmid et al., 2011). In contrast to the above, norm salience reflects social characteristics associated with status in the classroom, and is operationalized by determining the correlation between popularity and behavior characteristics of interest (Dijkstra & Gest, 2015). Popular students may serve as role models and guide classroom trends (Bandura, 1977). Accordingly, norm salience may serve as an index of important social characteristics in the classroom culture. Therefore, classrooms with different types of norm salience may provide a classroom context that is less or more accommodating to the social adjustment of students with disabilities. My aim is to examine whether social relations of students with disabilities differ in relation to classrooms with distinct types of norm salience.

In the United States, the Individuals with Disabilities Education Act (IDEA) includes an emphasis on promoting the social inclusion of students with disabilities. As these students are increasingly included in general education classrooms, it is important to better understand factors that impact their academic and social adjustment (Farmer et al., 2017). Not all students with disabilities exhibit social difficulties; however, research indicates that students with disabilities are more vulnerable to social difficulties than their nondisabled peers. Students with disabilities
are less likely to be accepted by peers (Frederickson & Furnham, 2004), more likely to be isolated (Chen et al., 2015), at increased risk of affiliating with marginalized peers who increase their social difficulties (Estell et al., 2007; Farmer & Farmer, 1996), and at a greater risk of being involved in bullying, as bullies or victims (Chen et al., 2015; Estell et al., 2009; Pearl et al., 1998). The focus of this study was on understanding how students with disabilities are situated within the peer ecology of different classrooms, in terms of norm salience. This study was driven by four specific research questions.

1. Can inclusive general education classrooms in the late elementary school years be classified in terms of norm salience?
2. Do the social roles, reputations, and social network placement of students with disabilities differ in classrooms as a function of distinct types of norm salience (high aggressive vs. high prosocial and academic)?
3. Does the peer victimization involvement of students with disabilities differ in relation to classroom norm salience type?
4. Do students with disabilities have different perceptions of the classroom ecology in relation to classroom norm salience type?

**Class Type Based on Norm Salience.** My first aim was to classify classrooms based on norm salience. This involved clarifying students’ level of popularity in the classroom and their corresponding social characteristics. To do this I operationalized popularity and the social characteristics of interest. First, to identify popular students, participants were asked to name up to three classmates who fit the following descriptor: “Some kids are very popular with their peers. That is, many classmates like to play with them or do things with them.” Based on the norm salience literature I hypothesized that academic, prosocial, and aggressive behaviors would
differentiate classrooms. For the purpose of this study the academic variable was originally set as *good student*, which was operationally defined as “This person makes good grades, usually knows the right answer, and works hard in class.” The other two variables were not single items, but were instead determined by combining multiple items to create a factor for each of these constructs. The aggression factor consisted of four items—*disruptive, starts fights, gets in trouble, and starts rumors*—and the prosocial factor consisted of three items—*cooperative, good student, and friendly* (refer to Appendix A for complete definitions).

Next, a norm salience index was generated by correlating popularity and each of the three behavior indicators within classrooms. This yielded a norm salience value for each of the three behavior constructs. These indicator variables were used to identify similar classroom clusters using LPA. Two classroom types were derived using LPA analysis that identifies patterns of shared similarities within the three variables across classrooms. One class type had a strong association between popularity and aggressive behavior and a weaker association between popularity and academic/prosocial behavior; this type was labeled *High Aggression Norm Salience*. In the other class type, there was a stronger association of popularity with academic and prosocial behavior and a weaker association between popularity and aggressive behavior; this type was labeled *High Academic/Prosocial Norm Salience*.

To interpret these findings, it is vital to contextualize these class types in relation to how constructs were measured, analyzed, and interpreted within the study, in order to consider how the operationalization of the key constructs influences our understanding of the class types. The construct of popularity in particular is critical to norm salience. For this study, popularity was operationalized using the Coie et al. (1982) definition. As previously discussed, this definition has two parts: the first part refers to popularity only ambiguously, while the second part
elaborates on the aspect of likeability by focusing on who respondents perceive classmates would prefer to play or do things with. This measure is thus reflective of students’ perceptions of what they believe their peers like, as opposed to their own preferences or their perception of who is popular. This measure does not assess salience directly, but salience may be inferred from it. For the academic measure, I used a single item, *good student*, that was also contained within the prosocial factor. This item may reflect both academic ability and teacher-preferred behavior. The prosocial factor appears to be reflective of characteristics that respondents are likely to perceive as making a peer easy to get along with; in contrast, the aggression factor seems to identify peers whose classmates view them as difficult to get along with and prone to causing trouble and hurting others. In all cases, it is essential to note that student responses may reflect students’ own characteristics and biases as well as the actual constructs of interest.

In addition to how constructs are measured, the way data are processed after measurement can also impact interpretation and meaning. In this study, several steps were taken to reduce the data to analyzable units: converting the raw data into standardized scores, creating factors to establish norm salience variables, and using LPA to identify classroom types. The data reduction process facilitates analysis, but it also transforms the data from their original form and may change their inherent meaning. LPA classification made it possible to identify two broad types of classroom, as gone over above; however, this binary distinction comes with its own set of limitation: it may be possible that classrooms within the same identified type may be dissimilar in important ways that are not represented in the current analysis; likewise, there may be classrooms that are similar in important ways across types that are related to the social experiences of students with disabilities but are not explored in the current data and analysis.
Post hoc analysis was used to determine if the two class types differed in terms of mean scores on popularity, academic, aggression, and prosocial behavior variables. Using a t-test analysis, I compared the means of these variables between the two class types. As I discussed in the beginning of the chapter, mean scores are also reflective of descriptive norms. A comparison of means indicated that there was no significant difference between the two groups on any of the four indicator variables (refer to Appendix F for table A6). This means that even though the two class types were considered different in norm salience, there was no significant difference in terms of descriptive norms. These findings indicate that norm salience is a distinct indicator of classroom social dynamics and paints a different picture of the classroom than descriptive norms do. Dijkstra and Gest (2015) had similar findings, in that they did not find any correlation between norm salience scores and descriptive scores; however, it is important to note that descriptive norms were not the focus of my study—these post hoc analyses were conducted only to help contextualize the findings. Previous research indicates that students aim to climb the social ladder by replicating popular students’ behavior (Dijkstra et al., 2008); thus, norm salience is reflective of popular student behavior, which is more likely to be replicated by students.

Dijkstra and Gest (2015) also used norm salience to categorize classrooms. Even though that study and the present study used distinct differences in measures and analytic processes used to arrive at the end product—distinct class types based on norm salience—both these studies had similar findings, indicating the existence of two class types. Dijkstra and Gest (2015), like the present study, used a combination of norm salience variables to classify classrooms. In addition, the current study used a norm salience variable for aggression, which is an aggregate of peer-nominated variables—disruptive, starts fights, gets in trouble, and starts rumors—while Dijkstra and Gest (2015) used norm salience variables for bullying; even though peer-nominated
aggression and bullying are different measures, they are both dimensions of aggression. The current study applied LPA using Mplus software, while Dijkstra and Gest (2015) study used K-means cluster analyses to classify classrooms; however, both studies identified a two-cluster solution as the best-fit model. In addition, the profiles of classrooms in Dijkstra and Gest (2015) were similar to those in this study. One of their class types was characterized as having positive norms for academic and prosocial behavior and neutral norms for bullying; this is similar to the class type labeled High Academic/Prosocial Norm Salience in this study. The other class type in Dijkstra and Gest (2015) was characterized as having negative norms for academic, neutral norms for prosocial, and positive norms for bullying; this class type is similar to the class type labeled as High Aggressive Norm Salience. Thus, we see that these classroom categories are more similar than different in terms of popular student behavior.

For the purposes of this study, it is clear that the two class types represent behaviors that are dominant among popular students within the respective classrooms. In one type, popular students are viewed as aggressive and not academically oriented, while in the other they are viewed as academically oriented and were prosocial. It is clear that norm salience is not only a nuanced way of understanding classroom social dynamics, but also provides this study with a unique vantage point, as it is a distinct aspect of classroom social dynamics. The next step in the present study was to look at the social placement and relations of students with disabilities in terms of these two class types.

**Social Roles and Reputations.** My second aim was to identify differences in social roles and reputations of students with disabilities that emerged as a result of their different class types. This involved looking at the data in two ways. First, the class types identified above were used to represent classroom peer ecology. Second, students’ individual social roles and reputations were
measured using 16 different peer-nominated variables: friendly, cooperative, disruptive, acts shy, starts fights, seeks help, leader, athletic, gets in trouble, good student, cool, sad, starts rumors, popular, trendsetter, and gets their way (refer to Appendix A for complete definitions). It should be noted that the same items were used for both the individual and the classroom levels. It should also be noted that the students were nested in the classrooms. Therefore, in the next step, I used hierarchical linear modeling (HLM) to examine the relationship between individual students’ social roles and reputations (the peer behavior assessment items) at the classroom level for students with disabilities specifically. I found that students with disabilities in High Academic/Prosocial Norm Salience classrooms are less likely to be nominated as leaders or to get their way than students with disabilities in High Aggression Norm Salience classrooms. Additionally, I also conducted an independent-samples t-test to identify differences descriptive norms on the variables leader and gets their way. Similar to the findings for the previous question, there was no significant difference between the two class types on these two variables (refer to Appendix F for table A6).

To interpret these findings, it is helpful to return to the operational definitions of these constructs. This study defined leader as “This person gets chosen by others as the leader. Other people like to have this person in charge.” Gets their way was defined as “Other kids do what this person wants. This person always gets their way.” These two items are associated in terms of the power they give students over their peers: a leader is someone who is in charge, and a person in charge is more likely to get their way, as peers aim to keep them happy and do things that are viewed positively by them.

It may also be helpful to consider the social experiences of these students within the two distinct classroom types. We know that students tend to organize themselves into groups based
on shared characteristics (including aggression, popularity, and bullying involvement) that reinforce and sometimes also compound their social difficulties (Cairns & Cairns, 1994; Logis, Rodkin, Gest, & Ahn, 2013); thus, interpreting the current findings in relation to our understanding of the social situation of students with disabilities, one possible interpretation is that students with disabilities may struggle to find their place within the social milieu in *High Academic/Prosocial Norm Salience* classrooms, and thus be less likely to be nominated as *leader* or to *get their way* than students without disabilities.

In this context, Barker’s (1968) manning theory also provides a valuable insight into the findings of this study, drawing from Moreno (1937), Bronfenbrenner (1943) and Cairns and Cairns (1994), who each provide a unique view of the individual within the context of the classroom. Adding another layer to our understanding of the classroom as a society, Barker (1968) maintains that individual behavior influences the functioning of a set of activities in a given environment. Barker and Gump (1964) studied two schools in the Midwest, one small and the other big. They contended that the big school had a large student population to pool from for activities, and that as a result if students did not excel in those activities they would lose the spot to a more capable peer. Thus, big schools would be “overmanned.” In contrast, in the small school there were more opportunities to take part, as there were fewer students to fill the spots. In this case, students who were not skilled would have access to more opportunities to learn skills and participate, as these small schools were “undermanned.” More contemporary, clearer language might term these classrooms “over-resourced” versus “under-resourced”—I will use these terms here. Kinney (1993) followed up on the middle school students from the Evans and Eder (1993) study, which discussed the social plight of middle school students who were bullied. Kinney (1993) noted that the social situation of some of those students improved in high school,
where there were had more opportunities to participate in school activates and have friends. This study thus indicates that middle schools are over resources environments where students who are struggling have less opportunity to thrive, but that these same students find positive peer relations when they are in under-resourced environments like large high schools, where they have more opportunities to participate in activities and be part of the classroom ecology.

In this study, High Academic/Prosocial Norm Salience classrooms are over-resourced classrooms, where it is more likely that students nominated as leaders, who will therefore get their way, are popular students, while in High Aggressive Norm Salience classrooms there are fewer students who have the opportunity to be identified as leader or get their way; thus, in these classrooms, students with disabilities have more opportunity to be nominated as leaders.

As a peer ecology is a unique composition of students and their interactions within their classrooms, it is quite possible that similar analyses on a different dataset will produce different findings that can build on the current research. Furthermore, as post hoc analysis here indicated that the classes were more similar in their composition, it would benefit the research community to find behaviors that differentiate classrooms and set them apart in terms of the influence of classroom characteristics on the social situation of students with disabilities. Additionally, it would be beneficial to explore behavioral characteristics of popular students and their influence on classroom social dynamics, as well as to explore the relationships between peer affiliations and the behaviors that give rise to them and connect peers.

**Social Network Centrality and Bullying Involvement.** In this section I will discuss part of my second and third research aims, which relate to social network centrality and bullying involvement; both these variables were categorical, and I used hierarchical generalized linear modeling (HGLM) to investigate them. Before I get into further detail, I will discuss how each of
these variables was measured and analyzed. The aim of these analyses was to identify differences in social network centrality and bullying involvement of students with disabilities as a result of class type.

Social network centrality is a measure of the social position of students in relation to their peers within their groups. The measure asks participants, “Are there some kids in your grade who hang around together a lot?” The data collected were entered into social cognitive mapping (SCM) software, which generates output matrices that determine group membership and a centrality index. The frequency with which a student gets nominated within a group is tallied, and based on this number, each individual student is categorized as nuclear, secondary, peripheral, or isolate. Project staff manually verified each participant’s network centrality, weeding out outliers.

Bullying involvement subtypes were created using a .50 SD cutoff on the peer-nominated variables bully and picked on; these items are part of the same peer nomination measure used in the previous analysis. Students were asked to name three peers they thought were bullies; the term was defined as “This person bullies others. This person is always hurting or picking on others.” The item indicates repeated aggressive behavior. In contrast, the picked on item was defined as “This person is picked on by others.” Students who only received peer nominations for the bully variable were identified as bullies, while those students who were only nominated for picked on were labeled as victims. Students who were nominated by peers as both bully and picked on were labeled as bully-victims, while students who were not nominated as either bully or picked on were labeled as not involved.

As both social network centrality and bullying involvement are categorical data, I used HGLM for data analysis. A limitation of analysis using HLM software is that it is not possible to
simultaneously compare four groups for each of these variables. Thus, each variable (*social network centrality: nuclear, secondary, peripheral, and isolate; bullying involvement: bully, victim, bully-victim, and not involved*) was broken into four separate binary variable categories/pairs (e.g. 0 = not bully, 1 = bully) to facilitate analysis. (This method is limited, however, in that it does not allow a comparative analysis.) I expected to find differences in social network centrality and bullying involvement for students with disabilities depending on their class type.

The results indicated no significant difference in social network centrality or bullying involvement of students with disabilities in either class type. This lack of significance may, in part, be attributed to the small number of students with disabilities within both class types compared to students without disabilities. However, if we only look at the individual level, on social network centrality variables students with disabilities were less likely to be nominated as nuclear members and more likely to be nominated as isolates compared to their peers without disabilities; similarly, for bullying involvement subtype variables at the individual level students with disabilities were more likely to be nominated as victims and less likely to be nominated as not involved compared to their peers without disabilities.

In the past literature, there is evidence to indicate that students with disabilities are more likely to be isolated or that they have lower levels of network centrality (Chen et al., 2015). Furthermore, research also suggests that students with disabilities are more likely to be involved in bullying relations than their non-disabled peers (Blake et al., 2012; Rose et al., 2009; Farmer et al., 2012). Additionally, they were more likely to be nominated as victims and more likely to be involved in bullying relations than their non-disabled peers. The findings of the current study at the individual level are reflective of this literature; however, it is important to note that there
was no statistical difference in the social network centrality and bullying involvement of students with disabilities as a result of classroom type—that is, being in either High Aggression Norm Salience classrooms or High Academic/Prosocial Norm Salience classrooms did not influence their network centrality placement or their bullying involvement.

Thus, neither the involvement of students with disabilities in bullying relations nor their placement within classroom networks was significantly related to class type within this study, whose results indicated that classroom norm salience did not influence social network centrality or bullying involvement for students with disabilities. As this dataset uses classroom averages, even one or two students who use aggressive means to maintain their power reduce the overall occurrence of bullying within classrooms. These students function as power brokers, and balance the equation of power by keeping other students in line and maintaining order within the classroom.

**School Belonging.** The final aim of this study was to identify differences among students with disabilities as a result of class type in level of school belonging and perception of bullying ecology. School belonging was measured using Hagborg’s (1998) 11-item self-report scale, which measures students’ individual sense of belonging and how they feel about their school, with items like “I feel like a real part of my school” (refer to Appendix C for all items). Students responded to each item using a five-point Likert-type scale, ranging from 1 = completely false to 5 = completely true. The total final score was derived using an aggregate of all 11 times; a high score indicated that the student had a positive sense of school belonging.

The perception of bullying was measured using Song’s (2005) Protective Peer Ecology Scale. This measure is subdivided into three different categories: peer protection, peer encouragement, and peer protection of bullying (refer to Appendix D for all items). Each of
these sub-categories was then aggregated, to get three separate scores. Like the school belonging scale, this too was a self-report measure.

The next step was HLM analysis, using the same process as before. The findings indicate that even though students with disabilities are more likely to be nominated as leader or as gets their way in High Aggressive Norm Salience classrooms, they have a greater sense of school belonging in High Academic/Prosocial Norm Salience classrooms. There was no significant difference on the Protective Peer Ecology Scale. The findings indicate that in classrooms in which popular students exhibit academic and prosocial behaviors, these behaviors are more valued by students with disabilities, who also feel they are more part of the classroom society in these classrooms. Moreover, students with disabilities feel more valued and better adjusted and have better sense of belonging in these classrooms, as there is less aggressive behavior endorsed by popular students.

In other studies, a greater sense of school belonging has been linked to positive social transition into middle school (Day, Hamm, Lambert & Farmer, 2014). Additionally, positive peer relations contribute towards positive school belonging. One study identified that positive school belonging during the fall and spring semester was significantly connected to and accounted for greater teacher attunement within these classrooms (Norwalk, Hamm, Farmer, & Barnes, 2015). These findings were corroborated by another study, which found school belonging to be related to the two semesters as well as being related to teacher attunement (Hamm, Farmer et al., 2011). Although this was not a longitudinal study, nor did it focus on teacher attunement, these studies taken together nevertheless indicate that students’ sense of belonging is related to a sense of safety and security provided by the teacher. Future studies with the same or similar datasets should thus take into account teacher attunement. As it has already
been established that there was no significant difference between descriptive norms and that norm salience does influence student behavior, it is essential to understand the role of the teacher in creating a positive classroom environment.

**Limitations**

The limitations of this study, in terms of its sample, design, measures, and analytic approaches, are discussed in this section to facilitate future studies building on these findings.

**Sample.** First, this study was conducted in rural schools, and is not representative of urban and suburban schools within the United States (or, of course, in other countries). Future studies should focus on including peer ecologies from metropolitan, urban, and suburban schools in order to gain a more comprehensive insight into classroom peer ecologies, which will differ across these locations in terms of gender, minority presence, disability presence, and socioeconomic status. Replicating this study on a range of different populations would provide a more comprehensive look at factors that influence classroom ecology. Second, as data on disability were collected from school records, this population as reflected in this study is not necessarily the same as the national population of students with disabilities. Future studies need to ensure representativeness in terms of disability identification within the sample. According to the U.S. Department of Education, about 14% of public school students in the United States received services under IDEA in the 2005–2006 school year (NCES, 2007). In contrast, in the current study, students with disabilities comprised only 5.25% of the population, a low proportion that may have biased the findings.

**Measures.** This study used peer-nominated variables that were often measured as single items. In addition, the construct of popularity was only inferred, not measured in terms of the current prevailing definition, and the operational definition focused more on preference than on
popularity. There may be a stronger salience to a measure based on popularity. With the current measure, correlations of popularity with social prominence factors (cool, good at sports, trendsetter) were high. It is known that popularity is a salient feature in organizing peer groups (Farmer et al., 2017). The use of multiple items or a more comprehensive item for popularity would likely align more closely to the construct measured.

**Design.** This study used an already extant database that had a number of measures on different aspects of classroom social dynamics. The major limitation of using an extant database is that the data are not designed to answer specific research questions raised in a given study. Thus, future studies need to focus specifically on collecting new data on classroom social dynamics. Additionally, classroom social dynamics is a fluid concept, as classroom dynamics are constantly changing. There is a need to gain multiple data points on this measure in order to trace changes in classroom dynamics. Developmentally, students in elementary, middle, and high school (respectively) have different factors that govern their classroom norms and influence their social dynamics. A research design that is sensitive to these changes or that can focus specifically on a particular developmental age will provide a more vivid picture of classroom dynamics for that context.

**Analytic Approaches.** Additional statistical methods need to be explored to analyze categorical data within a nested design. A chi-squared test does not allow the researcher to capture the nuances of the interaction between classroom type and disability category, while HGLM analysis does captures this nested interaction but does not allow comparative analysis of categorical data; for example, in this study, social network placement and bullying involvement types were made into binary instead of categorical variables. This is in part is a limitation of the HLM software, and future studies should explore other statistical software to support better
comparison. In addition, the measurement of bullying involvement was based on the binary variable *bully* versus *not bully*; however, of course, bullying is not that simple, and requires a more complex measure to evaluate bullying involvement subtypes that can be compared alongside categorical variables of *bully, victim, bully-victim,* and *not involved.* Similarly, the construct of social network placement was limited to the binary variable *nuclear* versus *not nuclear;* a more comprehensive categorical placement would identify students within the social network as *nuclear, secondary, peripheral,* or *isolate.* Furthermore, the small population of students with disabilities has reduced the power of the study and made comparison difficult.

**Implications for Research and Practice**

This study takes a step towards more thoroughly understanding the very complex concept of classroom social dynamics, pointing towards the need to identify patterns that emerge as a result of classroom norms and their influence on the social placement of students with disabilities within these classrooms. To help move the field forward, I will now present recommendations for future studies in terms of research and practice.

First, future studies need to focus on the use of longitudinal data to consider the influence of classroom social dynamics. It will be interesting to observe and evaluate how classroom ecology develops in relation to salient norms in terms of roles and reputations, social network placement, bullying involvement, and school belonging, and also to trace the social placement of students with disabilities over time. Secondly, identifying peer ecologies in contexts with different SES distributions and within metropolitan, urban, or suburban schools will either build on the two norm salience class type trajectories identified here or reveal multiple class types within the sample. Identifying and using other indicators to classify classrooms will also provide a different lens through which to view classroom ecologies. Moreover, an important player
within classroom social dynamics is the teacher; including teachers as part of these investigations will be an important step toward understanding classroom social dynamics.

Additionally, addressing the constructs of classroom social dynamics from different methodological aspects can be useful in defining the complex nature of these constructs. For example, qualitative analysis of these quantitate data may help to identify patterns of social placement and behavior of students with disabilities within the different types of classrooms and thereby further explain the social situation of students with disabilities in different class types. Observation of students within the two different types of classroom can also provide significant insight into the social dynamics of the classrooms. Additionally, observation of teachers within these two different class types can further research on pedagogy and provide new insight into classroom management strategies for inclusive classrooms. For the purposes of this kind of observation, appropriate measures will need to be created that accurately capture the construct of classroom social dynamics. Other research designs can also be applied to research on classroom social dynamics, such as focus groups and interviews designed specifically to discuss the formation of classroom social dynamics. This method should provide a better understanding of the factors that contribute towards the development of peer ecologies and to measures teachers can take to support the social and academic success of their students.

A deeper understanding of classroom social dynamics will help teachers understand how these constructs come together and influence the learning environment. As pointed out by Farmer et al. (2017), understanding the bi-directional exchange between the individual and the environment will help teachers identify ways to leverage the social situation in their classroom and create a classroom environment that is productive and facilitates learning. A better
understanding of these constructs will also facilitate teachers in developing adaptive, flexible expertise that responds to the changing classroom environment.

In another line of inquiry, it would be useful to explore the influence “high status peers” have on their group members. As Dijkstra, Cillessen, Lindenberg, and Veenstra (2010) indicated, peer association is more than just being friends; it is primarily about associating with “high status peers,” which, these researchers concluded increased individual students’ popularity. Dijkstra and his colleagues discussed the concept of reflected glory in relation to this affiliation with popular peers. Reflected glory captures the fact that through the process of association, students affiliating with popular students gloat on their social connection and use it as a means to increase their social standing. Thus, another line of inquiry should connect the dots regarding association with high status peers.

Thus, this study has merely looked at the tip of the iceberg, as I have aimed to bring a number of factors together to help explain the social situation of students with disabilities in school. There are a number of research avenues still to be pursued in order to make the social situation of students with disabilities more equitable within general education classrooms.

Conclusion

In conclusion, this study has taken a step towards understanding the social situation of students with disabilities and the influence of classroom social dynamics on their social adjustment in school. It has identified two prevailing class types, respectively based on aggressive and academic and prosocial norm salience. Furthermore, it has demonstrated significant differences in the situation of students with disabilities between the two class types: Students with disabilities are more likely to get their way and be nominated as leaders in High Aggressive Norm Salience classrooms than in High Academic/Prosocial Norm Salience.
classrooms, but they are also less likely to feel *school belonging* in the former classrooms. These results can help teachers understand the importance of managing classroom social dynamics in such a way as to contribute to the successful integration of students with disabilities within inclusive classrooms.
References


Appendix A

Peer-Nominated Behavior

For the following, name the three kids in your grade who best fit the description.

1) **Cooperative.** “Here is someone who is really good to have as part of your group, because this person is agreeable and cooperative – pitches in, shares, and gives everyone a turn.”

   ___________________           ___________________           ___________________

2) **Disruptive.** “This person has a way of upsetting everything when he or she gets into a group – doesn’t share and tries to get everyone to do things their way.”

   ___________________           ___________________           ___________________

3) **Acts Shy.** “This person acts very shy with other kids. It’s hard to get to know this person.”

   ___________________           ___________________           ___________________

4) **Starts Fights.** “This person starts fights. This person says mean things to other kids or pushes them, or hits them.”

   ___________________           ___________________           ___________________

5) **Seeks Help.** “This person is always looking for help, asks for help even before trying very hard.”

   ___________________           ___________________           ___________________

6) **Leader.** “This person gets chosen by others as the leader. Other people like to have this person in charge.”

   ___________________           ___________________           ___________________

7) **Athletic.** “This person is very good at many outdoor games and sports.”

   ___________________           ___________________           ___________________

8) **Gets in trouble.** “This person doesn’t follow the rules, doesn’t pay attention, and talks back to the teacher.”

   ___________________           ___________________           ___________________

9) **Good student.** “This person makes good grades, usually knows the right answer, and works hard in class.”

   ___________________           ___________________           ___________________

   _______________________________________________________________________

   Do not name more than three persons for each question.
   Remember, you do not have to fill in all the lines.

10) **Cool.** “This person is really cool. Just about everybody in school knows this person.”
11) Sad. “This person often seems sad.”

12) Starts rumors. “This person gossips and says things about others. This person is good at causing people to get mad at each other.”

13) Popular. “Some kids are very popular with their peers. That is, many classmates like to play with them or do things with them.”

14) Trendsetter. “This person sets the styles. Other people copy or imitate the way this person looks, dresses or acts.”

15) Picked on. “This person is picked on by others.”

16) Friendly. “This person is usually friendly to others.”

17) Bully. “This person bullies others. This person is always hurting or picking on others.”

18) Gets their way. “Other kids do what this person wants. This person always gets their way.”

19) Name the three classmates you like the most.

20) Name the three classmates you like the least.

21) If you could be one of your classmates who would you like to be?
Appendix B

Social Cognitive Maps

Friends and Groups

Are there any kids in your grade who hang around together a lot?  Yes / No

Please write their names on the lines below. Include each person’s last name. Name all the groups that you can think of.

Group 1: ________________________________________________________________

____________________________________________________________________

Group 2: ________________________________________________________________

____________________________________________________________________

Group 3: ________________________________________________________________

____________________________________________________________________

____________________________________________________________________

Group 4: ________________________________________________________________

____________________________________________________________________

Group 5: ________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

Are there some kids who don’t seem to have a particular group, who tend to stay by themselves a lot?

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

If you need more space, turn the paper over. Remember, you don’t have to fill in all the lines.
Appendix C
School Belonging Scale

My School

1. I feel a real part of my school.
   
2. People notice when I’m good at something.
   
3. Other students in this school take my opinions seriously.
   
4. Most teachers at my school are interested in me.
   
5. There’s at least one teacher or adult in this school I can talk to if I have a problem.
   
6. People at this school are friendly to me.
   
7. I am included in lots of activities at my school.
   
8. I am treated with as much respect as other students.
   
9. The teachers here respect me.
   
10. People know I can do good work.
    
11. Other students like the way I am.
    
** Please make sure to only mark one box per item **
Appendix D
Perception of the Peer Ecology

Below, you will be asked to respond to questions and statements about “bullies” and “bullying.”

**HOW OFTEN HAVE YOU BEEN BULLIED SINCE SCHOOL STARTED? (Circle one.)**

a) Never. I don’t get bullied.

b) One or more times a day.

c) One or more times a week.

d) One or more times a month.

**DID YOU STOP THE BULLYING FROM HAPPENING? (Circle one.)**

a) No. I am still bullied.

b) A little. Bullying stopped a little, but started again.

c) Mostly. Bullying mainly stopped, and only happened a little.

d) Yes, completely. I stopped it and it didn’t happen again.

e) I don’t get bullied.

**IF I KNOW THAT SOMEONE IN MY SCHOOL IS BEING BULLIED:**

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>A Little</th>
<th>Sometimes</th>
<th>A Lot</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I would tell the others to stop the bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I would help them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I would stick up for them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I would encourage them to tell the teacher about the bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I would try to make the others stop bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**IF I’M BEING BULLIED:**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Never</th>
<th>A Little</th>
<th>Sometimes</th>
<th>A Lot</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My peers would tell the others to stop the bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>My peers would help me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>My peers would tell me nice things to make me feel better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>My peers would stick up for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>My peers would encourage me to tell the teacher about the bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>My peers would hang out with me to make me feel better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>My peers would try to make the others stop bullying.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>My peers would talk to me to make me feel better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>My peers would come by to watch.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>My peers would laugh.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>My peers would encourage the bully by cheering.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>My peers would say things to the bully like “Show him!”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>My peers would get other kids to watch.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**Appendix E**

*Studies Using Peer Assessment of Social Behavior in Students with Disabilities*

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Age/Grade Range (Sample Size)</th>
<th>Disability (n)</th>
<th>Peer Assessment Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nabuzoka &amp; Smith (1993)</td>
<td>8–12 years (179)</td>
<td>LD = 36</td>
<td>cooperates, disrupts, shy, fights, seeks help, leader</td>
</tr>
<tr>
<td>Farmer &amp; Farmer (1996)</td>
<td>3rd and 4th grade (79)</td>
<td>EBD = 4</td>
<td>cooperative, starts fights, popular, athletic, disruptive, leaders, good at school work, and shy/w withdrawn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LD = 7</td>
<td>disruptive, starts fights, and gets in trouble (Though the larger research used 10 items, only these three items were analyzed for the study)</td>
</tr>
<tr>
<td>Farmer, Van Acker, Pearl &amp; Rodkin (1999)</td>
<td>4th, 5th, and 6th grade (1276)</td>
<td>LD = 142</td>
<td>cooperative, disruptive, shy, starts fights, leader, athletic, gets in trouble, good student, and cool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other = 35</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EBD &amp; ID = 21</td>
<td></td>
</tr>
<tr>
<td>Farmer, Rodkin, Pearl &amp; Van Acker (1999)</td>
<td>4th, 5th, and 6th grade (948)</td>
<td>LD = 80</td>
<td>cooperative, disruptive, shy, fights, seeks help, leader, funny, and unhappy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EBD = 8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OHI = 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ND = 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID = 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SI = 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>HI = 1</td>
<td></td>
</tr>
<tr>
<td>Frederickson &amp; Furnham (2004)</td>
<td>9–12 years (867)</td>
<td>LD = 115</td>
<td>cooperative, disruptive, shy, fights, seeks help, leader, funny, and unhappy</td>
</tr>
<tr>
<td>Rodkin et al. (2006)</td>
<td>4th, 5th, and 6th grade (790)</td>
<td>MD = 107</td>
<td>cooperative, disruptive, shy, starts fights, seeks help, leader, athletic, gets in trouble, good student, and cool</td>
</tr>
<tr>
<td>Estell et al. (2008)</td>
<td>3rd, 4th, 5th, and 6th grade (1361)</td>
<td>LD = 55</td>
<td>disruptive, starts fights, gets in trouble, starts rumors, cooperative, good student, friendly, athletic, cool, popular, shy, sad</td>
</tr>
<tr>
<td>Estell et al. (2009)</td>
<td>5th grade (484)</td>
<td>LD = 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EBD = 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID = 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SI = 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OHI = 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ND = 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>504 = 3</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* LD = Learning Disability; EBD = Emotional and Behavioral Disorder; ID = Intellectual Disability; ASD = Autism; SI = Speech Impairment; OHI = Other Health Impairment; HI = Hearing Impaired; ND = Non-Categorical; 504 = 504 Plan; MD = Mild Disability.
# Table A2

*Studies Evaluating Sociometric Status of Students with Disabilities*

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Age/Grade Range (Sample Size)</th>
<th>Disability ((n))</th>
<th>Measure of Sociometric Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabornie &amp; Kauffman (1986)</td>
<td>9th, 10th, 11th, and 12th grade (746)</td>
<td>LD = 46</td>
<td>Ohio Social Acceptance Scale 6-point rating scale *Round-robin design*</td>
</tr>
<tr>
<td>Sabornie &amp; Kauffman (1987)</td>
<td>9th, 10th, 11th, and 12th grade (579)</td>
<td>ID = 27</td>
<td>Ohio Social Acceptance Scale</td>
</tr>
<tr>
<td>Sabornie, Kauffman, Ellis, Marshall &amp; Elksnin (1987)</td>
<td>9th, 10th, and 11th grade (486)</td>
<td>LD = 28 EBD = 32</td>
<td>Ohio Social Acceptance Scale</td>
</tr>
<tr>
<td>Kistner &amp; Gatlin (1989)</td>
<td>3rd, 4th, and 5th (413)</td>
<td>LD = 44</td>
<td>Positive and Negative Peer Nominations *Three choices in each category*</td>
</tr>
<tr>
<td>Bear, Juvonen &amp; McInerney (1993)</td>
<td>3rd and 5th grade (46)</td>
<td>LD = 23</td>
<td>Positive and Negative Peer Nominations *Three choices in each category*</td>
</tr>
<tr>
<td>Nabuzoka &amp; Smith (1993)</td>
<td>8–12 years (179)</td>
<td>LD = 36</td>
<td>Liked Most and Liked Least Nominations *Three choices in each category*</td>
</tr>
<tr>
<td>Sale &amp; Carey (1995)</td>
<td>K–5th grade (524)</td>
<td>Currently Eligible = 37 Likely Eligible = 42</td>
<td>Positive and Negative Peer Nominations *Three choices in each category using individual interviews*</td>
</tr>
<tr>
<td>Haager &amp; Vaughn (1999)</td>
<td>14 years (141)</td>
<td>LD = 44 LA = 44</td>
<td>4-Point Peer Rating Scale *Round-robin design*</td>
</tr>
<tr>
<td>Estell et al. (2008)</td>
<td>3rd, 4th, 5th, and 6th (1361)</td>
<td>LD = 55</td>
<td>Positive and Negative Peer Nominations *Three choices in each category*</td>
</tr>
</tbody>
</table>

*Note.* LD = Learning Disability; EBD = Emotional and Behavioral Disorder; ID = Intellectual Disability, LA = Low Achievement.
## Table A3

**Studies on Popularity of Students with Disabilities**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Age/Grade Range (Sample Size)</th>
<th>Disability (N)</th>
<th>Peer Assessment Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer, Rodkin, Pearl, &amp; Van Acker (1999)</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;, and 6&lt;sup&gt;th&lt;/sup&gt; grade (948)</td>
<td>LD = 80, EBD = 8, OHI = 6, ND = 6, ID = 4, SI = 2, HI = 1</td>
<td>cool</td>
</tr>
<tr>
<td>Rodkin et al. (2006)</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;, and 6&lt;sup&gt;th&lt;/sup&gt; grade (790)</td>
<td>MD = 107</td>
<td>cool</td>
</tr>
<tr>
<td>Farmer &amp; Rodkin (1996)</td>
<td>4&lt;sup&gt;th&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;, and 6&lt;sup&gt;th&lt;/sup&gt; grade (406)</td>
<td>EBD = 20, LD = 26</td>
<td>popular</td>
</tr>
<tr>
<td>Estell et al. (2008)</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;, 4&lt;sup&gt;th&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;, and 6&lt;sup&gt;th&lt;/sup&gt; grade (1361)</td>
<td>LD = 55</td>
<td>popular</td>
</tr>
<tr>
<td>Estell et al. (2009)</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; grade (484)</td>
<td>LD = 15, EBD = 5, ID = 6, SI = 6, OHI = 4, ND = 1, 504 = 3</td>
<td>popular</td>
</tr>
</tbody>
</table>

*Note. LD = Learning Disability; EBD = Emotional and Behavioral Disorder; ID = Intellectual Disability; ASD = Autism; SI = Speech Impairment; OHI = Other Health Impairment; HI = Hearing Impaired; ND = Non-Categorical; 504 = 504 Plan; MD = Mild Disability.*
Table A4

*Studies on Peer Group Membership of Students with Disabilities*

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Age/Grade Range (Sample Size)</th>
<th>Disability (N)</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer &amp; Hollowell (1994)</td>
<td>3rd, 4th, 5th, and 6th grade (246)</td>
<td>EBD = 20, LD = 26</td>
<td>Teacher Report Form (TRF) Social Network Assessment Peer Behavioral Assessment</td>
</tr>
<tr>
<td>Farmer &amp; Farmer (1996)</td>
<td>3rd and 4th Grade (79)</td>
<td>EBD = 4, LD = 7</td>
<td>Social Network Assessment Peer Behavioral Assessment</td>
</tr>
<tr>
<td>Pearl et al., (1998)</td>
<td>4th, 5th, and 6th Grade (1538)</td>
<td>LD = 142, EBD = 14, OHI = 13, ND = 15, ID = 7, SI = 4, HI = 3</td>
<td>Social Cognitive Maps Peer Behavioral Assessment</td>
</tr>
<tr>
<td>Farmer, Van Acker, Pearl &amp; Rodkin (1999)</td>
<td>4th, 5th, and 6th grade (1540)</td>
<td>LD = 142, Other = 35, EBD &amp; ID = 21</td>
<td>Social Cognitive Maps</td>
</tr>
<tr>
<td>Farmer et al., (2011)</td>
<td>9th, 10th, 11th and 12th grade (1672)</td>
<td>STW = 164</td>
<td>Social Cognitive Maps</td>
</tr>
</tbody>
</table>

*Note:* LD = Learning Disability; EBD = Emotional and Behavioral Disorder; ID = Intellectual Disability; SI = Speech Impairment; OHI = Other Health Impairment; ND = Non Categorical; STW = Students with Disability.
Table A5

_Social Network Centrality of Students with Disabilities_

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample Age/Grade Range (Sample Size)</th>
<th>Disability (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer &amp; Farmer (1996)</td>
<td>3rd and 4th (79)</td>
<td>EBD = 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LD = 7</td>
</tr>
<tr>
<td>Farmer &amp; Rodkin (1996)</td>
<td>4th, 5th, and 6th (406)</td>
<td>EBD = 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LD = 26</td>
</tr>
<tr>
<td>Farmer, Van Acker, Pearl, &amp;</td>
<td>4th, 5th, and 6th (1540)</td>
<td>LD = 142</td>
</tr>
<tr>
<td>Rodkin (1999)</td>
<td></td>
<td>Other = 35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EBD &amp; ID = 21</td>
</tr>
<tr>
<td>Farmer et al. (2011)</td>
<td>9th, 10th, 11th, and 12th (1672)</td>
<td>SWD = 164</td>
</tr>
<tr>
<td>Chen et al. (2015)</td>
<td>6th (1861)</td>
<td>SWD = 102</td>
</tr>
</tbody>
</table>

*Note:* LD = Learning Disability; EBD = Emotional and Behavioral Disorder; ID = Intellectual Disability, SI = Speech Impairment; OHI = Other Health Impairment; ND = Non Categorical; STW = Students with Disability.
## Appendix F

Table A6

*Results of t-Test and Descriptive Statistics*

<table>
<thead>
<tr>
<th>Class Types</th>
<th>High Academic/Prosocial Norm Salience</th>
<th>High Aggression Norm Salience</th>
<th>95% CI for Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>n</td>
</tr>
<tr>
<td>Popularity</td>
<td>53.77</td>
<td>92.60</td>
<td>1170</td>
</tr>
<tr>
<td>Academic</td>
<td>64.18</td>
<td>118.95</td>
<td>1170</td>
</tr>
<tr>
<td>Aggression</td>
<td>34.66</td>
<td>71.94</td>
<td>1170</td>
</tr>
<tr>
<td>Prosocial</td>
<td>62.12</td>
<td>85.49</td>
<td>1170</td>
</tr>
<tr>
<td>Leader</td>
<td>44.07</td>
<td>79.70</td>
<td>1170</td>
</tr>
<tr>
<td>Gets their way</td>
<td>27.02</td>
<td>51.79</td>
<td>1170</td>
</tr>
<tr>
<td>School Belonging</td>
<td>3.68</td>
<td>.78</td>
<td>1096</td>
</tr>
</tbody>
</table>

* p < .05.