Teachers' Perceptions of Academic Intrinsic Motivation for Students with Disabilities

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Abstract

Students who report high levels of intrinsic motivation (IM) perform better on academic tasks compared with students who report low levels of IM. However, there is a paucity of data on IM for several student disability categories (e.g., intellectual disability). The primary focus of this study was to use a nationally representative sample of students with disabilities to understand if teachers' perceptions of students' academic IM varied by disability categories. Additionally, correlation and regression models were used to determine factors that influenced teachers' perceptions of academic IM for students with disabilities. Controlling for external factors, such as parental expectation of their child's academic career and teachers' pedagogical competence, attenuated gaps in teacher perception of student IM between students with intellectual disability and learning disability. Additionally, including student classroom collaboration variables such as frequency of participation in peer work and classroom discussion to the model reduced disparities in teacher perceived academic IM between students with autism and learning disabilities.

Keywords: Intrinsic motivation, students with disabilities, classroom discussion, peer work, parent expectation, autism, learning disabilities, teacher perception

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An individual's innate desire to engage in an activity has been referred to as their intrinsic motivation (IM). The term IM describes an individual's disposition to complete a task for the sake of internal rewards such as satisfaction or pleasure (Ryan & Deci, 2000). Several positive effects of IM on the academic outcomes of students in grades K-12 have been reported. Students with higher IM have better academic achievement (Lepper, Corpus, & Iyengar, 2005; Taboada et al., 2009), take a more favorable outlook toward challenges (Wigfield, Guthrie, Tonks, & Perencevich, 2004), spend more time with academic tasks, and gain a deeper understanding of the content (Baker, Dreher, & Guthrie, 2000; Schiefele, 1999).

Studies have also documented the importance of IM on academic outcomes for students with learning disabilities (LD) (Fulk, Brigham, & Lohman, 1998; Sideridis, Morgan, Botsas, Padeliadu, & Fuchs, 2006; Wiest, Wong, Cervantes, Craik, & Kreil, 2001). For instance, Logan, Medford, and Hughes (2011) found that IM explained a larger amount of variance in low ability readers' comprehension of text than it did for high ability readers. While students with LD self-report a more positive outlook towards school compared to peers without disabilities (Wilson & David, 1994), their overall academic IM is much lower compared to typically developing peers (Lee & Zentall, 2012; Zisimopoulos & Galanaki, 2009).

Although researchers have studied the effects of IM on typically developing children and students with LD, there is less information on IM for students with low-incidence disabilities, such as intellectual disability or autism spectrum disorder (ASD). Given the positive impact IM can have on students' academic outcomes, it is imperative to further our understanding of IM for students with other disabilities. More specifically, identifying potential disparities in students

with disabilities can help researchers and practitioners make informed decisions about classroom practices and interventions to improve current student motivation levels.

Theoretical Background

Self-Determination Theory

Self-determination theory posits that individuals are innately motivated to self-improve. However, one's social environment can positively or negatively impact the improvement process (Deci & Ryan, 1985). Within the framework of self-determination theory, the two most important types of motivation are extrinsic and intrinsic motivation (Deci & Ryan, 2000). Extrinsic motivation refers to the willingness to complete a task for the sake of an external incentive such as recognition, reward, or avoidance of punishment (Ryan & Deci, 2000). On the other hand, Deci (1975) theorized that IM denotes engagement in a task purely out of curiosity to enhance feelings of competence and self-determination. He further states that, to feel competent and self-determined, a person seeks challenging tasks and upon completion feels pleasure and satisfaction. It is important to note that neither intrinsic nor extrinsic motivation is a permanent or constantly sustained trait and an individual's motivation towards a task can change from intrinsic to extrinsic motivation and vice versa (Deci, 1975). Finally, both types of motivation can coexist in an individual simultaneously (Brophy, 2010).

Niemiec and Ryan (2009) propose that for individuals to be intrinsically motivated two basic psychological needs-- autonomy and competence--need to be satisfied. In educational settings, autonomy refers to students engaging in activities of their own free will without external coercion (Deci & Ryan, 1985; 2000). Skinner and Pitzer (2012, p.27) describe autonomous behavior as "the need to express one's authentic self and to experience that self as the source of action." For example, when students join group activities without being told to do so, or when

they keep working at a task even if it takes a long time, it indicates autonomous behavior in academic settings. Similarly, in educational settings, competence can be conceptualized as students need to be effective at an academic task (Elliot & Dweck, 2013). For instance, students who share their thoughts and ideas about academic tasks with peers and teachers or students who do things even if they are difficult, do so through an innate desire to interact competently with their social and physical environment (Skinner & Pitzer, 2012).

The importance of autonomy and competence to IM in academic settings is consistent with past and current research studies. For example, Deci, Schwartz, Sheinman, and Ryan (1981) found that students assigned to teachers with an autonomy orientation reported increased IM and perceived competence compared to students assigned to controlling teachers. More recently, Tsai, Kunter, Ludtke, Trautwein, and Ryan (2008) demonstrated that typically developing seventh graders in a German public school reported enhanced interest in lessons taught by teachers who were autonomy supportive, as opposed to those who were reported as controlling. By offering students choices in academic activities, chosen to be optimally challenging and backed by explanations of relevance, teachers can positively impact students' autonomy and competence needs, thus increasing their IM (Niemiec & Ryan, 2009).

Contextual Factors Influencing Academic Intrinsic Motivation in Students

The two most common contextual factors that influence students' academic IM are parents' expectations and teachers' competence (Weist et al., 2001). Parental expectation has been defined as the degree to which parents expect their child to succeed in school and their long-term expectations of their child's educational career (Glick & White, 2004; Jeynes, 2005, 2007). In their review of studies on parental expectations and student academic achievement, Yamamoto and Holloway (2010) report that parental expectations not only influence their child's

motivation and self-efficacy but also have a positive impact on parents' own involvement, leading to improved academic achievement for their child. However, they caution that high parental expectations can also negatively impact their child's academic motivation.

While parental expectations are theorized to play an important role in motivating children in earlier grades, teachers are thought to play a greater role in motivating students in later grades (Maehr, 1991). Teachers who implement effective teaching and classroom management practices promote autonomy and competence in their students (Brophy, 2010; Flink, Boggiano, & Barrett, 1990). Brophy (2010) states that teachers who are able to monitor student progress, create structured lessons with optimal challenge, and adapt instruction to increase active student involvement can help students develop competence at academic tasks. Furthermore, teachers' skills in managing students' behavior through an emphasis on choice making rather than control provides students opportunities needed to be autonomous learners (Deci et al., 1981). In classrooms with diverse student backgrounds, creating a welcoming classroom environment for students from different cultural or socio-economic backgrounds can play an important role in how students perceive their classroom environment (Brophy, 2010). For example, students' self-report on learning experiences has shown that those who perceived teachers to support autonomous behavior and competence needs had high academic achievement, classroom engagement, and IM, thus, self-reporting low negative classroom learning experiences (Jang, Reeve, Ryan, & Kim, 2009). In short, the ability of teachers to create autonomous and competence-supporting environments plays an important role in how intrinsically motivated their students feel.

In addition to the above two factors,, we explored if frequency of student participation in classroom collaborative work (i.e., participation in peer work and group discussion) influenced

teachers' perceptions of academic IM. In general, students who participate regularly in collaborative classroom activities demonstrate higher academic IM (Brophy, 2010; Dweck, 1989; Finn, 1993; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). However, for students with disabilities, studies generally report low level of participation in classroom group activities (Bradley, Doolittle, & Bartolotta, 2008; Chung, Carter, & Sisco, 2012; Kluth & Darmody-Latham, 2003). Students' lack of participation in collaborative tasks could be due to low motivation towards academic tasks or could be associated with reasons other than motivation. For instance, low frequency of participation in collaborative work can be a result of the severity of impairment that hinders participation in activities (Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001), impairment in social interaction (Weiss & Harris, 2001), or lack of availability of assistive technology needed to enable participation (Lee & Templeton, 2008).

Differences in Academic Intrinsic Motivation Among Students with Disabilities

Intrinsic Motivation in Students with High Incidence Disabilities

Researchers have extensively explored the effects of IM on academic outcomes for students with LD. Studies have shown that IM has a positive association with students' academic performance (Proctor, Daley, Louick, Leider, & Gardner, 2014; Wiest et al., 2001). However, Dev (1997) posited that students with LD have lower academic IM because they are less likely to be intrinsically motivated towards academic tasks than typically developing peers due to their low competence in academics. Dev's hypothesis was evinced in two studies where investigators administered the Children's Academic Intrinsic Motivation Inventory (CAIMI, Gottfried, 1986), a self-report measure of IM, to students with LD and peers without disabilities (Wilson & David, 1994; Zisimopoulos & Galanski, 2009). Both studies reported that students with LD self-reported notably lower IM compared to typically developing peers.

In another study, Fulk et al. (1998) compared students with LD to students with emotional or behavior disorders (EBD) and their peers without disabilities. Students with EBD self-reported the lowest IM, whereas students with LD were more likely to avoid academic tasks. These studies confirm that student with high incidence disabilities tend to report lower IM compared to their typically developing peers. However, it is unclear what role student competence, autonomy, and environmental factors, such as activities used in the classroom, are associated with IM in this student population.

Intrinsic Motivation in Students with Low Incidence Disabilities

In the field of ASD, researchers have hypothesized that students with ASD have social impairments due to low social motivation (Chevallier, Kohls, Troiani, Brodkin, & Schultz, 2012; Van Etten & Carver, 2015). They further posit that students with ASD have low IM towards social activities compared to peers without disabilities . However, studies have shown that interventions targeting students with ASD's academic motivation have had positive effects on their task engagement and reduced disruptive behavior (Dearden, Emerson, Lewis, & Papp, 2016; Koegel, Singh, & Koegel, 2010).

Research on the effects of IM on students with low incidence disabilities is less common (Cuskelly & Gilmore, 2014). In their review of literature pertaining to IM in people with intellectual disabilities, Haywood and Switzky's (1986) study suggested that those who were intrinsically motivated tended to display higher self-regulating behaviors and were more capable of living independently compared to peers with similar diagnoses who were solely extrinsically motivated. More recently, a proxy report of self-determination in adults with intellectual disability, as described by healthcare professionals and social workers who interacted with these individuals reported lowest levels of self-determination in individuals with the most severe

intellectual disability (Nota, Ferrari, Soresi, & Wehmeyer, 2007). However, we could not find studies with self-reported or proxy data on IM or self-determination for students with intellectual disability highlighting the paucity of research on academic IM in this student population. Additionally, unlike students with high incidence disabilities, data on effects of autonomy, competence, and classroom factors on students with low incidence disabilities' academic IM is not available.

Teachers' Rating of Students' Academic Intrinsic Motivation

Past investigations that have studied teacher perceptions of student IM have used observable student engagement behavior items. For example, *student communicates feeling related to a book* (Sweet, Guthrie, & Ng, 1998) or *student continues to work on problems until they are solved or understood* (Stinnett, Oehler-Stinnett, & Stout, 1991). However, studies that have compared teacher report and student self-report of academic IM have found positive but not strong correlations (Gottfried, 1985; Grolnick & Ryan, 1990). The lack of strong correlation between teacher and student report of IM may be attributed to some survey items that teachers rate students' academic motivation on pertain to statements of behaviors that can be difficult to physically observe. For instance, Stinnett et al. (1991) asked teachers to rate student academic motivation on the following unobservable behavior, '*shows pride in work*' (p. 279). It is unclear how a teacher would differentiate 'pride' from 'happiness' or other similar constructs. Hence, we take Reeve's (2012) recommendation to include items of observable student classroom behaviors to measure teacher report of student academic motivation. This study uses teacher reported survey data questions of the Special Education Elementary Longitudinal Study (SEELS, Holden-Pitt, 2005) that are similar to teacher reported survey items of student academic motivation used in past studies (Ginsburg & Bronstein, 1993; Stinnett et al., 1991; Sweet et al., 1998).

Purpose of this Study

Student motivation towards school related tasks plays a vital role in their academic success. However, very little is known about academic IM for students with disabilities. The purpose of this study was to measure if academic IM varied in different student disability categories. We chose to use a proxy measure of student academic IM because research to date has not explored how teachers perceive IM in students with disabilities. It is important to know how teachers perceive their students because teachers play an influential role in enhancing and promoting students' academic IM (Furrer & Skinner, 2003; Grolnick & Ryan, 1990; Sutton & Wheatley, 2003). An additional reason for choosing to study a proxy measure of academic IM in students with disabilities was the availability of teacher report on observable classroom behaviors that attribute academic IM through the SEELS survey dataset. Also, for certain students, such as those with severe intellectual disability or students with ASD requiring substantial support, it may not have been possible for participants to respond to cognitively complex questions about their academic IM. Hence, a proxy measure may be the best way to collect student motivation data.

Thus, for this study, teacher ratings were used to measure if students identified with different disabilities varied in their teacher perceived academic IM. In past studies, researchers have administered Likert-scale survey items that measure teacher perceptions of typically developing students' academic IM. For this study, we used teacher survey items that ask teachers to rate the frequency of observable student classroom behaviors that represent student IM toward academic tasks. Furthermore, given that the direction of parental expectations and teacher competence can have positive or negative impacts on students' IM, we assessed whether these contextual factors explain disparities in IM among students with disabilities. The impact of

frequency with which students participated in classroom collaboration work was also studied. We hypothesized that including frequency in classroom participation in the model would explain additional variance in teacher perceptions of IM in different student disability categories.

Using a nationally representative sample of students with disabilities from the SEELS database, we answered the following research questions: 1) Do teachers' ratings of academic IM for students with disabilities vary by student disability category? 2) Do predictor variables such as parental expectations, teacher competence, and student classroom collaboration help explain factors that influence and predict teachers' ratings of academic IM for students with disabilities?

Method

Data Source

We analyzed data from SEELS, a longitudinal study funded by the Office of Special Education Programs to obtain a nationally representative sample of students with disabilities aged six through 12 in 1999. SEELS contains data on over 13,000 students with disabilities who were randomly selected from 245 local education agencies and 35 special schools from all over the country.

Several data collection instruments were used to collect the data. Parent interviews were conducted over the phone to collect data on family and student characteristics, out of school activities, and parents' perspectives of school programs. Alternately, teachers were surveyed about students with disabilities' classroom experiences in terms of accommodations, assessments, and academic progress. Similar student data were collected from a survey designed for school staff and administrators who were aware of the students' progress. Additionally, students were also surveyed about their outlook towards school. Furthermore, data was collected on school characteristics, students' assessment results, and their secondary school transcripts.

Analytic Sample

The analytic sample for this study was taken from Wave 1 of the SEELS dataset. The sample included 13,035 students with disabilities aged 8 to 14 years at the time of data collection. Sample size varied based on the number of student data points available for each variable/composite included in the analysis. Survey and replicate weights were used to generate population estimates in Tables 1, 2, and 3.

Measures

Teacher Perception of Academic IM for Students with Disabilities. Five teacher student-rating variables were used from the SEELS teacher survey to create an IM composite variable that represented teachers' perception of academic IM for students with disabilities. The SEELS questionnaire surveyed teachers on student practices in the classroom. Although not a validated instrument for measuring teacher perceptions of student IM, the items selected from the teacher survey were similar to questions included in past surveys of teacher perceived student motivation. The following five variables asked teachers to rate student actions on a scale of 1 to 3 (Never, Sometimes, Very Often): (i) keep on task until he/she is finished, even if it takes a long time (TRAAM; Stinnett et al., 1991); (ii) join group activities without being told to do so (Ginsburg & Bronstein, 1993; Sweet et al., 1998); (iii) do things on his/her own even if they are hard (TRAAM; Stinnett et al., 1991; Sweet et al., 1998); (iv) ask for what he/she needs to do his/her best in class (Sweet et al., 1998); (v) communicate his/her thoughts and ideas (Sweet et al., 1998). The composite variable of all five teacher rating variables had a Cronbach's alpha reliability estimate of 0.79. Additionally, we also conducted a principal component analysis where results showed only one component with an eigenvalue greater than 1.

Teacher Competence. The SEELS teacher survey asked teachers to rate their pedagogical competences on various aspects of teaching and classroom management. A subset of questions that aligned with Brophy's (2010) recommendation of classroom practices that teachers can use to enhance student motivation were chosen to create an overall teacher competence composite. The questions asked teachers to rate their level of competence on a scale of 1 to 5 (1=Needs improvement, 5=Fully competent) in: (i) motivating students to participate in academic tasks; (ii) adapting instruction or materials to student's individual needs and achievements; (iii) teaching reading skills; (iv) monitoring students' progress; (v) managing students' behavior; and (vi) considering and building on the cultural diversity of students. The composite variable of all seven teacher competence ratings had a Cronbach's alpha reliability estimate of 0.82. Principal component analysis results indicated only one component with an eigenvalue greater than 1.

Parent Expectations. The parental expectations composite measure comprised of variables from the SEELS parent survey. Survey items selected described the parents' expectations of their child's current and future academic success (Jeynes, 2005, 2007; Yamamoto et al., 2010). Parent expectations were measured based on the following questions: (i) respondent expects child will graduate from high school and get a regular high school diploma; (ii) respondent expects child will attend school after high school; (iii) respondent expects child will graduate from a 4-year college; and (iv) respondent's overall college expectations from child. Parents were required to rate their expectation on a Likert-scale of 1 to 4 (1= 'Definitely will not' to 4= 'Definitely will') for the first three questions. The fourth question's responses presented the following options: 1 = 'Definitely graduate from 4-yr college' to 4 = 'Definitely will not graduate from 2-yr college.' The overall parent expectation composite variable had a

Cronbach's alpha reliability estimate of 0.93. Principal component analysis results indicated only one component with an eigenvalue greater than 1.

Student Classroom Collaboration. Two classroom collaboration questions from the SEELS teacher survey were used for this measure. Teachers were asked to provide feedback on the frequency (1=Never, 4=Often) with which a particular student a) worked with a peer, partner, or group, and b) participated in class discussion during Language Arts instruction.

Gender and Income. Past investigations have indicated that students' gender and SES can influence their levels of academic IM. For instance, in typically developing children, Wigfield and Guthrie (1997) found that girls were more motivated to read compared to boys. Additionally, Ginsburg and Bronstein (1993) noticed that teachers reported a negative relationship between academic IM and students' SES. Hence, both variables were included in regression models as covariates. Students' SES was categorized based on their annual household income as low income (< $25000), middle income ($25001-$50000), and high income (> $50000).

Data Analysis

The primary purpose of the study was to assess the extent to which teachers' report of academic IM varied between different student disability categories. All analyses incorporated the sample and replica weights to make national population inferences and account for the SEELS complex survey design. Weighted summary statistics were used to determine mean teacher ratings of academic IM among students with disabilities. The second research question explored factors that influence teachers' perceptions of academic IM for students with disabilities. A preliminary analysis was conducted using weighted correlation between teacher perception of academic IM and factors that influence IM. Finally, regression models were estimated to

measure the simultaneous effects of disability categories, gender, SES, teacher characteristics, parent expectation, and classroom collaboration on teacher perceptions of students' IM in the classroom. All analysis was conducted using STATA (StataCorp, 2013).

Results

Research Question 1: Intrinsic Motivation by Disability Categories

Teachers' perceptions of academic IM for students with disabilities varied by student disability categories. The levels of perceived academic IM are presented in Table 1. Teachers perceived students diagnosed with ASD to have the lowest academic IM (M=1.84, SE=0.02). Students identified with EBD, multiple disabilities, other health impairments, traumatic brain injury, and intellectual disability were perceived to have lower academic IM compared to students identified with visual impairments, LD, orthopedic impairments, hearing, and speech language impairment. Teacher perception of IM in students with EBD, multiple disabilities, other health impairments, traumatic brain injury, and intellectual disability ranged from a mean of 2.00 to 2.10 while teacher perception of IM in students with visual impairments, LD, orthopedic impairments, hearing, and speech language impairment ranged from a mean of 2.12 to 2.34. The largest magnitude of difference in teacher perceived student academic IM was between students with speech language impairment and ASD (Cohen's d = 0.99).

Research Question 2: Explaining differences in Intrinsic Motivation

Correlation Analysis. A preliminary examination of the relation between teachers' perceptions of academic IM for students with disabilities and factors that influence teachers' perceptions of academic IM such as teachers' own competence, parent expectations, and classroom collaboration was conducted using weighted correlation analysis (see Table 2). There were positive and significant ($p<0.01$) correlations found between teacher perception of

academic IM and all other variables. Notably, teacher perception of academic IM had a moderately strong positive relation with student participation in class discussion (r=0.47).

Regression Models. In Table 3, we present regression model predicting teachers' perceptions of academic IM for students, controlling for disability category, SES, gender, and external factors that influence IM in students (teacher competence, parental expectations, and classroom collaboration). The results in Model 1 support the initial results. When compared to academic IM for students with LD, teachers perceived students with ASD as having the lowest levels of academic IM followed by students with EBD. Similarly, teachers perceived students with speech language impairment and hearing impairment to have the highest academic IM compared to students with LD. However, with an adjusted-R^2 of 0.05, controlling for disability categories does not explain much of the variance in teachers' perceptions of academic IM.

Model 2 included SES and gender in addition to student disability. Students from high and middle-income households were perceived to have higher academic IM compared to students from low SES when controlling for gender and disability status. Furthermore, controlling for SES and disability category, teachers perceived male students to have lower academic IM compared to their female peers. The addition of SES and gender increased the estimated variance accounted for in teacher perceived IM in students with disabilities from 5% in Model 1 to 9% in Model 2, while the gaps in teacher perceived academic IM by disability categories remained similar.

Model 3 controlled for contextual factors that influence academic IM in students with disabilities (i.e. teacher competence and parental expectations) in addition to student disability categories, gender, and income. Controlling for teacher competence and parental expectations had a positive effect on teacher perceived academic IM. For instance, controlling for contextual

factors positively reduced the gaps in perceived academic IM across disability categories with intellectual disability no long statistically different from LD. Teacher competence and parental expectations explained an additional 5% of the variation in academic IM.

Lastly, Model 4 controlled for the frequency with which students participated in classroom collaboration strategies such as peer work and class discussions in addition to all model 3 predictors. Adding classroom collaboration variables to the model had a positive effect on teacher perceived academic IM. Controlling for the frequency with which students participated in classroom collaboration tasks further reduced the disparities in academic IM by disability type. The gap between ASD and LD is reduced from -0.29 in Model 3 to -0.09 in Model 4 (all $p<0.01$). Frequency of participation in peer work and class discussion explained a larger proportion of the variance (an additional 20%) than the previous three models.

Discussion

The purpose of this study was to add to the current body of literature on academic IM for students with disabilities. First, a nationally representative sample of students with disabilities was used to understand if teachers perceived academic IM to be different in students depending on their disability category. Second, previous IM research literature was used to develop predictor variables to help explain factors that influence and predict teachers' ratings of academic IM for students with disabilities.

Teachers' Perceptions of Academic Intrinsic Motivation for Students with Disabilities

The results indicate that teachers perceived students with ASD to have the lowest academic IM compared to students with other disabilities. Considering that classroom collaboration had a positive effect on teacher perceptions of academic IM, it could be that social challenges experienced by students diagnosed with ASD (Weiss & Harris, 2001) contribute to

teachers' perceptions of low academic IM in this population. This study's finding is congruent with recent studies that reported social deficiencies accounted for low social motivation, and were associated with low IM in social engagement among students with ASD (Chevallier et al., 2012; Van Etten & Carver, 2015).

Furthermore, the unadjusted results showed that teachers in general perceived students with EBD, intellectual disability, multiple disabilities, and other health impairments to have lower academic IM compared to students with LD. It could be that teacher perceptions of students' academic IM is negatively associated with the severity of their disability as evinced by caregivers' reports in Nola et al.'s (2017) findings. Past teacher self-report data has shown that teachers report lower level of competence in dealing with students with severe disabilities such as intellectual disability and report working with students with EBD to be more stressful than other disability categories (Avramidis, Bayliss, & Burden, 2000). Thus, it could be that teachers who have low levels of competence in addressing the academic needs of students with severe cognitive or behavior diagnosis, perceive these students to have lower academic IM.

Effects of Contextual Factors on Teacher Perceived Academic Intrinsic Motivation

Parental expectations and teacher competence overall had a positive effect on teacher perception of academic IM for students with disabilities. The gap in teacher perception of academic IM is reduced between students with LD and intellectual disability when accounting for these two contextual factors. This finding suggests that the gap may exist due to differences in parent expectations and the competence levels of teachers assigned to students of both disability categories. However, contextual factors did not impact perceived academic IM for students with EBD, multiple disabilities, and other health impairments; as the teacher perceived academic IM gap with LD remained about the same.

The positive relation between parents' academic expectations and IM is consistent with research showing parental educational aspirations to be a strong positive predictor for students' IM in learning English and math (Fan & Williams, 2010). Thus, not only are parental expectations an important indicator of academic IM in typically developing students, but it appears to apply to students with disabilities as well. However, this study's results indicate that parental expectations explain only a small proportion of the variance in teachers perception of student academic IM. Also, differences in parental expectations do not appear to explain disparities in teacher perception of academic IM across disability categories.

The frequency with which students participated in classroom discussions had the strongest effect on teachers perceptions of students academic IM. This finding suggests that student participation in classroom collaboration tasks plays an influential role in teacher perceptions of student academic motivational levels. Thus, when students with disabilities engage in collaborative classroom strategies, it not only enhances their academic achievement (Fuchs, Fuchs, & Burish, 2010; Klingner, Vaughn, Arguelles, Hughes, & Leftwich, 2004), but appears to also influence their academic motivation as perceived by their teachers.

The Effects of Gender and SES on Academic Intrinsic Motivation

According to the regression results, students from low SES backgrounds were perceived to have lower academic IM compared to their middle-income and high-income disabled peers after controlling for disability category. This finding is similar to teacher reports of academic motivation in typically developing students (Ginsburg & Bronstein, 1993). Furthermore, longitudinal data on typically developing students' SES and self-report of academic IM also shows a significant positive correlation between the two variables (Froiland & Oros, 2014). Additionally, teachers perceived male students to have lower academic IM compared to females

after controlling for SES and disability category. Results of past studies are congruent with the findings of this study: Males have self-reported lower IM compared to females in typically developing children (Wigfield & Guthrie, 1997), English language learners (Lee & Kim, 2014), and students with LD and EBD (Fulk et al., 1998).

Limitations

Data used to analyze teacher perceptions correspond to participants from the first wave (i.e. 1999) of SEELS. Several factors related to teachers' perceptions of students' IM may have changed over the course of the last 18 years and the current data analysis arguably reflects schooling within that temporal context. However, there are trends that continue to be pertinent and lend insights into IM in current students with disabilities. For instance, students with disabilities consistently have lower academic achievement compared to their typically developing peers (Sideridis et al., 2006), and students with lower academic achievement usually have lower academic IM (Lepper et al., 2005). Thus, the disparities in perceived student academic IM identified in this study are a concern and can inform policy intervention.

Another limitation of the study is that the items used to create the composites for teacher perception of student IM, teacher competence, and parental expectations were not elements from validated scales. Parents and teachers only responded to general survey questions and not questions about specific constructs (e.g., teacher perception of student academic IM). Furthermore, the most significant predictor of teachers' perceptions of academic IM for students with disabilities – classroom collaboration – was restricted to two items: peer work and class discussion. The classroom discussion variable provided information of students engaging in discussions solely during English Language Arts classes, thus failing to generalize discussions to other content area classes. Classroom collaboration encompasses several more variables

indicative of collaboration, such as peers sharing thoughts about a text, engaging in group projects, and exchanging feedback (Guthrie & Klauda, 2014). Also, it was unclear if these classroom collaboration strategies were evidence-based practices (EBPs) such as Peer Assisted Learning Strategies (PALS; see Fuchs, Fuchs, Mathes, & Martinez, 2002) or Collaborative Strategic Reading (CSR; see Klingner & Vaughn, 1998).

Despite the broad coverage of content in the SEELS survey, several factors pertinent to academic IM were absent and thus could not be measured. For example, the importance of providing students with choice making opportunities, optimal challenge, and tasks/topics that align with their interests (Brophy, 2010). Finally, no causality can be claimed based on correlational data used.

Implications for Practice and Future Research

Various analyses of SEELS data consistently showed that teachers perceived students with ASD to have the lowest academic IM compared to students with other disabilities. Considering that studies (Dearden et al., 2016; Koegel et al., 2010) have reported positive effects of motivation related interventions on academic outcomes for students with ASD, it is imperative that teachers, along with school and district level administrators, invest more time and resources in implementing interventions that improve autonomy and competence levels in students with ASD.

Furthermore, controlling for the frequency with which students participated in classroom collaborative work, such as peer work and classroom discussion, attenuated the disparity in teacher perceived academic IM between students with ASD, multiple disabilities, and intellectual disability when compared to students with LD. However, it is noteworthy that students with disabilities may not engage in classroom collaborative work for a variety of reasons, such as low

motivation, deficits in social communication, the unavailability of accommodations such as assistive technology, or the severity of their disability (Chevallier et al, 2012; Lee & Templeton, 2008; Simeonsson et al. 2001; Van Etten & Carver, 2015; Weiss & Harris, 2001). Thus, it is a cause for concern if teachers in general perceive students lack of participation in class collaborative work as an indicator of low academic IM. Given the challenges students with disabilities face in the classroom, teachers may need to reevaluate how they perceive IM in students with disabilities.

This study provides information on how teachers' perceptions of academic IM varies across disability categories. Future studies should expand the scope of this research using self-reported data from students identified with different disabilities. However, for certain students with severe intellectual disability or students with ASD requiring substantial support, proxy measures such as parent or teacher report may be the best way to evaluate individuals' IM. Future studies could also be designed to compare self-reported IM data from students with disabilities with data of proxy report (i.e. teacher, caregiver) of IM among student populations to determine the strength of correlation between the two variables.

It would also be interesting to determine whether engagement in classroom activities, such as classroom discussion and peer work, are an accurate indicator of self-reported academic motivation among students with disabilities as it is for their typically developing peers (Brophy, 2010). Such studies are necessary because students with disabilities are sometimes unable to participate in collaborative work due to factors other than motivation. It may also provide an impetus to motivation theorists to revisit IM theory and provide a theoretical framework that accommodates variance in observable motivation behavior between typically developing students and students with disabilities.

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Table 1

Teacher Perceived Intrinsic Motivation in Students by Disability Category

Student's Primary Disability Category	M	SE	95% CI
Autism Spectrum Disorder	1.84	0.02	1.79, 1.89
Emotional Disturbance	2.00	0.02	1.96, 2.05
Hearing Impairment	2.28	0.02	2.24, 2.33
Learning Disability	2.21	0.02	2.17, 2.25
Intellectual Disability	2.10	0.02	2.06, 2.15
Multiple Disabilities	2.02	0.03	1.96, 2.09
Other Health Impairment	2.05	0.02	2.00, 2.10
Orthopedic Impairment	2.21	0.02	2.17, 2.26
Speech Language Impairment	2.34	0.02	2.29, 2.38
Traumatic Brain Injury	2.12	0.04	2.03, 2.20
Visual Impairment	2.22	0.03	2.16, 2.28

Note: Weighted Sample (Balanced Repeated Replication Estimations)

Table 2

Intercorrelations among variables

Variable	1	2	3	4	5
1. Teacher Perceived Intrinsic Motivation	1.00	-	-	-	-
2. Teacher Competence	0.13**	1.00	-	-	-
3. Parent Expectations	0.27**	0.008	1.00	-	-
4. Student Works with Peers	0.20**	0.08**	0.13**	1.00	-
5. Student Participates in Class Discussion	0.47**	0.11**	0.15**	0.25**	1.00

Note: Weighted Sample (Balanced Repeated Replication Estimations). **p<0.01

Table 3

Weighted Sample Variables that Explain Teacher Perceptions of Intrinsic Motivation in Students with Disabilities

Variable	Model 1		Model 2		Model 3		Model 4	
	b (CI)	SE	b (CI)	SE	b (CI)	SE	b (CI)	SE
Autism Spectrum	-0.36**	.03	-0.39**	.03	-0.29**	.03	-0.09**	.03
Disorder	(-.42, -.30)		(-.43, -.29)		(-.36, -.22)		(-.16, -.03)	
Emotional	-0.20**	.02	-0.17**	.03	-0.17**	.03	-0.15**	.03
Disability	(-.26, -.14)		(-.23, -.09)		(-.24, -.10)		(-.22, -.09)	
Hearing	0.07*	.03	0.05	.03	0.04	.03	0.08**	.03
Impairment	(.01, .13)		(.01, .15)		(-.02, .11)		(.02, .14)	
Intellectual	-0.10**	.02	-0.8*	.03	0.007	.03	0.03	.03
Disability	(-.16, -.04)		(-.13, .001)		(-.08, .06)		(-.03, .10)	
Multiple	-0.18**	.03	-0.19**	.04	-0.11**	.04	-0.04	.03
Disabilities	(-.26, -.10)		(-.25, -.09)		(-.19, -.02)		(-.12, .02)	
Other Health	-0.15**	.03	-0.17**	.03	-0.15**	.03	-0.14**	.03
Impairments	(-.22, -.09)		(-.23, -.09)		(-.21, -.08)		(-.20, -.08)	
Orthopedic	0.002	.03	-0.01	.03	-0.008	.03	-0.01	.03
Impairment	(-.05, .06)		(-.05, .07)		(-.07, .05)		(-.07, .04)	
Speech Language	0.12**	.03	0.11**	.03	0.08*	.03	0.09**	.03
Impairment	(.06, .19)		(.06, .20)		(.01, .15)		(.02, .15)	
Trauma Brain	-0.08†	.04	-0.08	.05	-0.03	.05	-0.05	.05
Injury	(-.18, .004)		(-.18, .03)		(-.14, .07)		(-.15, .03)	

Visual Impairment	0.01 (-.05, .08)	.03	-0.002 (-.06, .08)	.03	-0.005 (-.08, .06)	.03	0.02 (-.04, .09)	.03
Middle Income			0.09** (.01, .14)	.03	0.06* (.002, .13)	.03	0.06* (.001, .12)	.03
High Income			0.19** (.12, .24)	.03	0.14** (.08, .20)	.03	0.13** (.08, .19)	.02
Male			-0.11** (-.17, -.06)	.02	-0.10** (-.15, -.04)	.02	-0.11** (-.16, -.06)	.02
Teacher Competence					0.09** (.04, .14)	.02	0.05* (.01, .09)	.02
Parent Expectation					0.13** (.10, .17)	.01	0.09** (.06, .13)	.01
Class Collaboration								
a. Works with peers							0.02 (-.01, .05)	.01
b. Participates in Discussion							0.28** (.25, .31)	.01
adjusted- R^2	0.05		0.09		0.14		0.34	
Population Size	3,106,183		2,167,288		2,197,724		2,128,463	
N	13035		11545		11460		11304	

Note[1]: Student's household income defined as: Low income when < $25000; Middle income when $25001 to $50000; High Income when >$50000.

Note[2]: b = Unstandardized coefficients, CI = 95% Confidence Interval, SE = Standard error
**p<0.01, *p < .05, †p<.10.