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Adapting Instruction in Response to Academic and Social Situational Tendencies: Supporting a Student With a Learning Disability

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Students with learning disabilities identify teachers' understanding of them as learners as crucial for their empowerment and success in school. This study provides insight into how the analysis of students' academic and social situational tendencies can provide teachers with better understanding of their students' educational experiences and lead to strategic adaptation of instruction. For this qualitative case study, the researchers analyzed the mathematical and social tendencies of an eighth-grade student with a learning disability as well as the support tendencies of a tutor during various tutoring situations. Findings indicated that recognition of patterns of student tendencies between learning situations helped the tutor adapt instruction accordingly to promote an environment conducive to success.

Keywords: **Learning Disability, Social Factors, Academic Tendencies, Middle School, Mathematics**

Introduction

Education legislation in the United States requires that all students have access to and succeed with grade level content (e.g., Every Student Succeeds, 2015; Individuals with Disabilities Education Improvement Act, 2004); yet, students with learning disabilities (LD) often perform significantly below their peers without disabilities in mathematics (National Center for Education Statistics, 2013). To close this gap, students with LD need to develop strong foundational understanding of mathematics in elementary school and grow as learners to adapt to the increasingly complex concepts they encounter in middle school; eventually, these students will need to build a necessary understanding of mathematics for success in high school courses (National Council of Teachers of Mathematics, 2000). Success with high school mathematics courses can lead to better post-secondary outcomes (Hartwig & Sitlington, 2008). Therefore, general and special education researchers and practitioners need to better understand how students with LD can access mathematics in secondary settings and the key supports they will need to be successful (Marita & Hord, 2017). To provide the supports students with LD need, teachers must develop understanding of their needs and experiences to best adapt instruction.

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Supporting Students with LD

In the United States, students with LD are identified in schools through one of two ways; students can be labeled with LD if they are evaluated to have average intelligence through an IQ test, yet score significantly lower in one or more areas on a standardized assessment or if they fail to make academic progress in a tiered system of increasingly individualized interventions (Gresham & Vellutino, 2010). Students with LD in mathematics tend to struggle with a variety of skills, yet are quite capable of succeeding with the use of research-supported interventions (Gersten, Chard, Jayanthi, Baker, & Morphy, 2009; Marita & Hord, 2017). In addition to the academic challenges that influence the learning of students with LD, these students are also affected by factors such as anxiety, difficulties with memory and processing, and social concerns (Ashcraft & Krause, 2007; Rodis, Garrod, & Boscardin, 2001; Swanson & Beebe-Frankenberger, 2004). It can be difficult to isolate these individual factors for study in research due to their nature; some factors are compounding in influence and others overlap in how they can affect student learning and academic experience. Recent researchers have acknowledged the abundance of factors that impact student learning and challenged others to develop better understanding of how these students learn and engage with mathematics (e.g., Lambert, 2015; Lewis, 2014). With this mindset, a holistic approach to studying how students with LD engage in the mathematics classroom is necessary to explore how instruction can be adapted to meet the multi-faceted, academic, emotional, and social needs of students with LD.

Academic challenges and supports for students with LD. Students with LD in mathematics tend to have difficulties with basic skills as well as more contextualized tasks, such as word problems, especially when these students also have LD in reading (Fuchs, & Fuchs, 2002; Gersten et al., 2009). Students with LD often struggle in mathematics courses due to difficulties with memory and processing (Swanson & Beebe-Frankenberger, 2004). These struggles may be worsened by deficiencies in foundational knowledge; instead of easily recalling information from long-term memory, their thinking processes may be impeded when they have difficulties with connecting foundational knowledge to complex problem solving processes (Ericsson & Kintsch, 1995; Gersten et al., 2009).

Despite the challenges facing students with LD, some of these students have demonstrated the ability to succeed when intervention support is provided (for summary, see Gersten et al., 2009). In recent studies, students with LD have succeeded in middle school mathematics with the use of visual supports and thinking strategies for problem solving (for review, see Marita & Hord, 2017). Often, students with LD are also able to develop skills that help them to utilize their strengths to work around many academic deficits that cause them to struggle with traditional instructional methods (Rodis et al., 2001). While there are studies that describe academic interventions that are effective for students with LD, there is a gap in the literature in regard to a more holistic approach to what educators can do to support students with LD emotionally and socially, in addition to providing scaffolding for their academic needs. This holistic approach that explores the interaction between social, emotional, and academic tendencies is needed to determine how these topics can be further studied in causal and intervention-specific research.

Student emotional and social needs. Middle school is a time when students often have to cope with a variety of changes that can lead to anxiety, discontent, and a decline in academic performance (Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Feelings of anxiety can also be associated with negative feelings of self and stress around perceived peer acceptance (Grills-Taquechel, Norton, & Ollendick, 2010). This time has the potential to be especially difficult for students with LD as these students often experience higher levels of anxiety than their peers (Nelson & Harwood, 2011). However, positive dispositions towards mathematics and emotionally supportive instructional environments can help facilitate continued advancement in mathematics (Hord, Marita, Walsh, Tomaro, & Gordon, 2016).

In addition to anxiety and emotional challenges, adolescence is often a time for social changes that can impact learning. Group membership in middle school is often associated with academic achievement (Wentzel & Caldwell, 1997) as students are likely to be influenced by their social groups and adopt similar characteristics. Perceived peer support plays a unique role in the academic success of middle school students; as adolescents begin to grow independent of their parents, they rely more on peers for validation and motivation (Wentzel, 1998). How students fit themselves into the hierarchy of status in mathematics class can have an effect on their performance; students who are lower achieving may identify as being at a lower status and students who are higher achieving may fear making errors will cause them to lose their status (Lambert, 2015). Students who are focused on attaining social status may not have a priority focus on academics and may instead demonstrate social tendencies to achieve certain appearances, such as the "class clown" or as a student who is "too cool" to try (Hicks, 1997).

Making Adjustments Based on Understanding of Student Experiences

Middle school mathematics classrooms are a place where students with LD are likely to be especially vulnerable due to increasingly complex content and social pressures (Hicks, 1997; Wentzel, 1998). In the face of increasing anxiety for these students, which may exacerbate the tendency to struggle with memory and processing (Ashcraft & Krause, 2007), teachers need to be especially informed. When students are engaged in an environment that promotes a positive disposition toward mathematics, they are more likely to feel a sense of belonging in the mathematics classroom community (Hackenberg, 2010). In addition, through caring relationships with their teachers, students have the opportunity to feel "they are being listened to, that their ideas are valued, and, perhaps, that they are understood" (p. 47) and as a result, students become empowered to engage with mathematics (Hackenberg, 2005). As teachers observe their students' tendencies, they are in a better position to make adjustments that consider the students' academic challenges, anxiety and emotional states, and social pressures.

To better understand the factors that affect the learning and success of students with LD, we explored the situational tendencies of a middle school student with LD during mathematics tutoring. We argue that, when educators understand the situational experiences of their students, instruction can be adapted to best support students to be successful. This study was guided by two specific research questions: 1) What are the situation-dependent tendencies of a student with LD within a middle

school mathematics tutoring context? and 2) How does a tutor adjust his instructional methods in response to the situational tendencies of a student with LD?

Method

The researchers utilized an exploratory qualitative case study design (Creswell, 2013) to analyze and describe the attitude, motivation, and behavior of an eighth-grade student with LD as he engaged with Algebra I content through six tutoring sessions. For this article, we present an analysis of a subset of data collected for a larger study about the impact of tutoring for supporting students with LD. We utilized a single instrumental case study, a case utilized to provide insight into a particular phenomenon, to allow us analyze the participant's experience at the micro-level through detailed, in-depth data (Creswell, 2013; Stake, 2010).

We conducted the study in an urban secondary school (grades 7 through 12) in the Midwestern United States. During the previous school year, the second author established a tutoring program in collaboration with the eighth-grade mathematics teacher and the special education teacher. Throughout the school year, pre-service teachers tutored struggling students on their current classwork on a weekly basis. The tutors were trained on research-based strategies for supporting struggling learners in mathematics and frequently met with the second author to discuss their tutoring successes and challenges. The tutors were given no prior notice of what topics would be covered during the session and were consistently on a time schedule to support their students to solve as many correct classwork problems as possible. The tutoring context was chosen for two reasons. First, it allowed for the participant to receive additional instruction and intervention in a one-on-one or small group setting. Second, it provided an opportunity for the tutor to develop a relationship with the participant. By becoming a consistent figure in the classroom as a tutor, the field researcher was able to build a relationship with the participant and gain an understanding of the participant's experiences within the class.

The third author, Zach, was the typical tutor for the participant and served as the primary field researcher. Zach was a pre-service middle childhood education student specializing in mathematics instruction. Zach tutored the participant during his general education mathematics class or intervention time to work on additional problems that corresponded with the concepts taught in class. He provided direct support when needed, engaged in conversations with the participant around the mathematics concepts, and built rapport through a mentoring relationship.

Participant

The researchers chose one participant, using purposive intensity sampling (Patton, 2002), who would benefit from additional support and also had noticeably different mathematical and social tendencies depending on setting, implying the importance of context for his mathematics engagement. Lester was an eighth-grade, African American student with LD who received intervention services for both mathematics and reading. According to Lester's records, he had a history of difficulty with reading comprehension and vocabulary, but had frequently put effort into his mathematics coursework and had a strong desire to perform independently. According to Lester's psychoeducational report, he often asked for sample problems so

he could learn by duplicating procedures and tended to excel quickly when concepts were explained or demonstrated. Lester also had a history of anxiety related to academics. His report included that Lester tended to "feel inadequate about his work and does not want to lose face in front of his peers" and "needs to feel successful in his endeavors." He had a history of using distracting behaviors to disguise frustration and anxiety and had a note in his report about a "severe emotional breakdown" due to anxiety. During an evaluation, the school psychologist also included that Lester had "feelings of inferiority and insecurity" that caused anxiety for him.

According to Zach, Lester was a well-liked and outgoing student. When working with another student in the school, the researchers were asked, "Do you know Lester yet? *Everybody* knows Lester." Zach described that Lester enjoyed working with friends during math, especially when he was solving problems faster and more accurately than others. Lester tended to talk often during tutoring and made jokes with friends frequently. Lester displayed a variety of situation-dependent behaviors, making him an appropriate participant for this study.

Data Collection

For this study, Zach tutored the participant weekly for an academic year. We included the six tutoring sessions for which we had approval from the Institutional Review Board and consent from the participant. Each session lasted 50 to 80 minutes and occurred in a variety of situations including: Zach tutoring Lester one-on-one, Zach tutoring Lester with a university faculty member present, and Zach tutoring Lester in a small group (see Table 1). We collected data in the form of audio recorded tutoring sessions, photographs of work samples, field notes by Zach and researcher-observers, and critical documents such as the participant's psychoeducational report and education program. The critical documents allowed us to gain background information on the participant to better support him mathematically and to compare our observations of Lester with patterns of behavior that had been noticed by his educational team. We also conducted interviews with Zach throughout the year to gather information related to the participant's progress and general trends as well as to gain insight into the themes that began to emerge from the data (Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005). The multiple data sources were necessary for planning how to best support Lester and to triangulate between findings (Brantlinger et al., 2005; Maxwell, 2013).

Data Analysis

For phase 1 of data analysis, our goal was to gain a holistic sense of the data (Miles, Huberman, & Saldaña, 2013). The first and third authors listened to the audio recording for each session while independently memoing about anything that appeared to be a mathematical or behavioral pattern. Then, we transcribed all sessions. For phase 2 of data analysis, our goal was to highlight examples in the data where the participant displayed consistent or inconsistent behavior while engaging in mathematics within and between situations. The first author read through the transcripts and highlighted all significant segments where the participant demonstrated the tendencies noticed during memoing. We then coded all highlighted segments. Phase 3 of data analysis was comprised of coding and development of

themes. We first completed open coding (Strauss & Corbin, 1998) of all significant segments to capture our initial perceptions about the participant's and tutor's behaviors and then used process coding to describe the observable and conceptual action displayed by the participant in the data (Miles et al., 2013). For example, the line of dialogue, "Lester: Oh yeah so fresh," was initially coded as "silly singing" during open coding and then "making others laugh" during process coding. We then combined instances where Lester's actions seemed to be similar and categorized them into overall categories. For the previous example, the segment was then coded as a pattern of being "seen as a comedian" as a social tendency. While combining similar codes into overall categories, we also made note of instances when codes contradicted one another or could have provided evidence against the emerging patterns.

Table 1. ***Logistics of Tutoring Sessions***

Session	Situation Type	Length
1	Tutor + Peer	20 minutes
	Tutor + Faculty	30 minutes
2	Tutor + Peer	10 minutes
	Tutor Only	40 minutes
3	Tutor Only	80 minutes
4	Tutor Only	20 minutes
	Tutor + Peer	60 minutes
5	Tutor + Peers	80 minutes
6	Tutor + Faculty	50 minutes

The research team met frequently to discuss the development of patterns by compressing codes into overall tendencies (Miles et al., 2013) until we were all in agreement (Brantlinger et al., 2005). The third author completed a validity check for these generalizations because he had spent significant time with the participant outside of the sessions included in this study (Stake, 2010). He was able to determine whether the evaluations were accurate, using his experiences with the participant throughout the academic year. We determined final descriptions after triangulation between all data and agreement between research team members (Maxwell, 2013). To ensure interpretive validity (Maxwell, 2013), an independent auditor who was not associated with the study read through all six transcripts. The auditor was another researcher from a special education background who was familiar with qualitative data collection and analysis. Based on the transcripts, the auditor validated the patterns included in Table 2 and the conclusions we made from the data. We discussed the auditor's feedback and integrated it into our final manuscript (Brantlinger et al., 2005).

Findings

In our findings, we will highlight the participant's mathematical and social situational tendencies (see Table 2) and Zach's caring, noticing, understanding, and adjusting (see Hackenberg, 2005; Rodis et al., 2001) to Lester's needs that varied between each situation. We will describe how these actions of teaching and learning impacted the participant's success with and focus on mathematics. We will break down our findings by the various social situations of the tutoring sessions and include a few selected examples from each situation to illustrate how the different situations affected both Lester and Zach's actions.

Table 2. ***Trends from Each Tutoring Social Situation***

	Tutoring Social Situation		
	Tutor Only	Tutor + Faculty	Tutor + Peer(s)
Participant mathematical tendencies	Complains about work; Asks for procedural shortcuts and demonstrations; Willing to struggle through material	Works without complaint; Follows tutor suggestions; Asks for help from tutor	Emphasizes academically superior mentality; Initiates and joins off-task conversations; Makes excuses and becomes defensive when he is unsure
Participant social tendencies	Generally appropriate, but sometimes immature behavior	Appropriate, polite behavior	Seen as comedian; Focus is on seeming "cool" to peers; Defends himself against jokes; Sometimes refocuses group to avoid getting in trouble
Tutor support tendencies	Uses targeted intervention strategies; Created caring environment; Uses praise and verbal encouragement	Uses targeted intervention strategies; Creates sense of purpose through research study	Uses targeted intervention strategies; Uses competition and challenges to encourage work

Lester's mathematical tendencies seemed to differ by situation; the amount of time he spent productively working on the assigned mathematical tasks depended on the context. When working with Lester, Zach always incorporated various research-supported strategies into his teaching to support Lester mathematically. However, in addition to supporting Lester's academic needs, Zach was also able to

incorporate other strategies in response to Lester's changing mathematical and social tendencies such as creating a caring environment, using praise and verbal encouragement, creating a sense of purpose, and using competition and challenges.

Working One-on-One with the Tutor

Frequently, Lester worked one-on-one with his tutor, Zach. The relationship established between Lester and Zach was fairly informal, yet it was clear, through their interactions with one another, that Zach was an authority figure. In an interview, Zach described their relationship and the rapport build between them:

> We ended up having a mutual respect. He ended up respecting my time and he knows I'm there to help him… but there were times when I would give him a little, I guess, behavior discipline like "Hey man, we need to start doing stuff cause this is my job and I have to report back that you did something to the boss" and he'd be like "Oh okay" and he'd buckle down.

Throughout the academic year, Zach established an environment where he and Lester could have fun, but was ultimately a space for learning mathematics. Zach described his expectations as a tutor in an interview, "If they can 'goof off' for five minutes here and there and then get serious, I think that's perfect." When working with Zach, Lester seemed to be relaxed and without concern for how he was viewed socially.

Without an audience of peers, Lester's social tendency was to be respectful toward Zach with the occasional immature attitude or remark, such as "I'm not working unless I get some candy." or "I'll just work very slow." Lester's acknowledgement of Zach's role as a mentor and role model could be seen through the way he treated Zach. Their rapport was apparent when they cheered for correct answers, talked about their common interests, and teased one another in a good-natured way. Comments such as "The juices is flip, ya know what I mean!" (see Table 3 line 3) show how they enjoyed spending time together and developed some sort of camaraderie. Though he also seemed to be comfortable complaining to Zach about working, he was usually compliant and listened when Zach told him to "get serious" or "do it."

When Lester and Zach had the opportunity to work one-on-one, he sometimes complained to avoid working on assignments, but would become determined once he engaged with the content. In an interview, Zach described Lester's mathematical tendencies, saying "Lester loves to try and get an easy way out of a problem. Even if he knows how to complete the work on his own, he would rather ask me to show him how to do it or continuously try to use a calculator until I end up taking it away from him." Lester's report indicated that he tended to be timid regarding trying challenging problems; however, when working with Zach, Lester was more adventurous in his mathematical risk-taking and persevered through problems. While he would often say "I don't know." or "It just is." in a group setting, Lester was willing to justify his reasoning one-on-one (see Table 3 line 2). Lester seemed motivated to learn, appeared to have little anxiety about answering incorrectly, and admitted when he needed help.

Table 3. ***Examples of Patterns from Work with Tutor***

General Category	Situational Pattern	Example
Participant mathematical tendencies	Complains about work	**Lester:** Oh man. This one is looking kinda rough. **Zach:** I feel like you say that about every single topic. Even if it's 2 plus 4. Like this one's looking rough today. (both laughing) **Lester:** It do.
Participant mathematical tendencies	Willing to struggle through material	**Zach:** What do you think is going to happen before you put it in? I'd like to see what you think even before you put it into the calculator. **Lester:** Um for this one I don't know, but I'm going to take a wild guess. **Zach:** A wild guess is better than no guess. **Lester:** It's going to go up? **Zach:** Like the whole thing is going to go up? **Lester:** Yeah. **Zach:** We'll see. We'll see what happens. **Lester:** It was a little different. I don't know how to explain this. **Zach:** Well let's look at the points. What happened there? **Lester:** It went down then it topped at 2 then it went back up.
Tutor support tendencies	Creates caring environment	**Lester:** Oh this is an easy one. You ain't even gotta help me.... That's x. Don't tell me! That's x.... I got it right! Yay! **Zach:** We're getting close. **Lester:** We got the juices flowing. That's too easy. That's open, that's closed. Then you gotta draw the line. The juices is flip, ya know what I mean! The juices is flip! You ain't even gotta help me with this. The flowing ain't they! **Zach:** They're going! They're chugging!

When working one-on-one with Lester, Zach utilized a variety of instructional strategies. Overall, it seemed a combination of specific interventions and a caring and supportive learning environment allowed Lester to productively work. Zach described how Lester was "Often intimidated by problems before he even attempts to work them out", but "builds confidence with multiple successful problems in succession." Because Lester did get intimidated, Zach would remind him of procedures and concepts he had previously learned. Zach described how this tended to be a successful strategy for keeping Lester moving: "I would write it out and show him some steps and you would see him light up like 'Oh yeah, I remember how to do that.' If he got stuck here and there, I would be like 'Look back at the example.'" After experiencing some success, Lester often gained confidence, which seemed to create positive energy for engaging in more problems. His enthusiasm and independence often increased as he figured out problems and he made comments such as "Oh this is an easy one. You ain't even gotta help me." (see Table 3 line 3). Zach's supports allowed for Lester to motivate himself as he experienced success as well as reduce anxiety related to answering incorrectly.

Working with the Tutor with a University Faculty Supervisor

Throughout the academic year, a university faculty member observed the tutoring sessions between Lester and Zach. Having the faculty observer present seemed to have an impact on Lester's attitude and motivation and caused changes in both Lester's mathematical and social tendencies compared to when only Zach was present. Lester seemed more focused on his work and remained productive on the assigned problems whenever the observer was present. He seemed more interested in learning the content, frequently asked for help, and willingly admitted when he did not understand how to solve a problem or made a mistake by simply saying "I don't know if I'm doin' this right." (see Table 4 line 1). Lester's tendency to complain about work was not present when the faculty member observed. Instead of making jokes with Zach, he took mathematical recommendations more seriously and assumed the role of a learner who was there to receive help rather than the mentoring "buddy" relationship seen one-on-one.

Zach strategically used the faculty member's presence as a reminder to Lester of his role in a larger research project. This reminder seemed to create a sense of purpose within Lester that motivated him to do well as a contributing member of the project. Zach described the influence of involvement in the research project on Lester, saying how knowing he would be included in a research study "got him excited to do some good math." Lester seemed to take pride in his role in the research study. Zach said Lester "has interest in going to college, and when he is told how certain topics may help him in the future he will buckle down for that problem." Participating in the study seemed to make Lester feel special, motivating him to do his best.

Table 4. ***Examples of Patterns from Work with Tutor and Supervisor***

General Category	Situational Pattern	Example
Participant mathematical tendencies	Follows tutor recommendations; Admits when he needs help from the tutor	**Zach:** Well let's write down the theorem. You know what the theorem is? The equation? **Lester:** No. **Zach:** It's the $a^2 + b^2 = c^2$ … Yes? No? Remember that? **Lester:** I don't remember that. **Zach:** You don't remember that? Well hold on it's called the Pythagorean Theorem. $a^2 + b^2 = c^2$. **Lester:** Say that again? (writes it down)
Tutor support tendencies	Creates sense of purpose	**Zach:** This is important now. Well, it was before because you guys were getting help, but this is extra important. This is research now

Working with the Tutor and Peers

Zach would often work with a small group of students, including Lester. Lester most frequently worked with the same peers, one of whom was Harrison. While working with peers, Lester exhibited tendencies that were drastically different from both his mathematical and social tendencies in other situations. Zach described the variations in Lester's productivity with comments such as "When they're in a group, they'll sort of goof off, but when I get him separated from his friends he hammers out some serious math."

Lester often scored higher than his two peers and used his levels of achievement to create an environment where his peer viewed him being at a higher level mathematically. Lester frequently used competition and bragging to show he was better at mathematics than Harrison by saying things like, "I got this before you!" (see Table 5). Zach described Lester's mathematical tendency to emphasize his academic superiority, saying:

> Lester frequently uses his high grade average to show that he may be the smartest in the group… [Lester will] go into a spiel about what grades he has in all of his classes. If that is not the case, it is typically something similar and Lester will rant about how much work he did that day. This seems to be his go-to defense mechanism when he may not feel as if he is the dominant academic person.

This characteristic is also highlighted in his report, which included "He feels inadequate about his work and does not want to lose face in front of his peers." He also spoke confidently, even when he was unsure of an answer, likely to seem as if he knew the answers in front of his peer, and made excuses for incorrect answers. Overall, Lester seemed to demonstrate these tendencies to avoid appearing vulnerable as appearing incompetent was a source of anxiety for him.

Lester's preoccupation with portraying an image of superiority in mathematics and social status resulted in a significant amount of time not working productively on mathematics as Lester both initiated and joined in distracting conversations. These conversations included complaining about working on assignments, "making fun" of other students, talking about TV shows, etc. His social focus seemed to be targeted toward appearing "cool" and often led to conversations where Lester acted like he did not care about school or responsibilities, bragged about material possessions, or challenged Harrison in some way. However, Lester would also end off-topic discussions and refocus the group with conversation-enders such as "Alright, I don't care." to avoid trouble, indicating that he still was mindful of his underlying desire to succeed academically and be respectful of Zach.

Lester seemed to embrace the role of the comedian with his peers. In the group context, Lester constantly made jokes about his peers, which were often reinforced by the laughter of others. This behavior suggested that Lester thought jokes at the expense of others were ways to win favor among his peers. However, when Lester was the root of a joke, he became extremely defensive as to maintain his social status. Zach said "Lester seems to be a popular kid with the friends that are also tutored with him and he seems to work better when being good at math is the cool thing to do that day"; however, Lester's concern with seeming "cool" in front of his peers interfered with the time and effort spent on learning and practicing mathematics.

When tutoring in a group, Zach recognized how Lester's mathematical and social tendencies differed from other situations and adapted instruction accordingly. When describing Lester, Zach remarked that Lester was a "competitive learner and worker… he wants to make sure that he is getting better grades and working faster than the people around him." Zach used Lester's competitive nature to his advantage by utilizing competition as a way to motivate the students to work on the problems. Although this strategy usually encouraged Lester to do his best, Zach described how it was not always effective, saying "This occasionally isn't a good thing because he will work faster, but not smarter, just to say that he has done more problems." Though Lester was not always accurate in his problem solving, competition and challenges among the group seemed to be a productive strategy for encouraging him to work.

Table 5. ***Examples of Patterns from Work with Tutor and a Peer***

General Category	Situational Pattern	Example
Participant mathematical tendencies	Emphasizes academically superior mentality	**Lester:** I already know. I'll bet money on it. Here you go. Here you go, paper. I bet money. **Lester:** Wait so you thought it was 200? He thought 2 x 16 was 211! **Harrison:** I had the right answer. **Lester:** Its 32, bruh. This is right my bruh! So the main thing that he did wrong is that he did 16 x 2 is 211.
Participant mathematical tendencies	Initiates and joins off-task conversations	**Zach:** What's your first instinct? What would you do? **Harrison:** Cheat. **Lester:** Yeah, Cheat. **Zach:** Cheat? (laughing) **Lester:** My first instinct on what? **Zach:** When you see this problem, what's your first instinct of what to do? **Lester:** Oh oh oh. Cheat! **Zach:** You guys aren't going to cheat. **Lester**: Oh this is easy.
Participant social tendencies	Defends himself against jokes	**Harrison:** How many girls' numbers you got in your phone? **Lester:** Mariah, Ashley… **Harrison:** They your cousin! **Lester:** They ain't my cousin! Hey where my phone at right now? I call her and I tell her you like her. She say I don't like his ugly face. Ahh! **Zach:** Don't bring that phone out. We're trying to work.
Tutor support tendencies	Uses competition and challenges to encourage work	**Lester:** (starts to snicker at Harrison working) **Zach:** I don't see you getting any better ideas, Lester. **Lester:** He's overthinking instead of looking at one over one hundred. **Zach:** Alright Lester this is on you now. You gotta teach Harrison how to do that. **Lester:** Okay, so first you gotta find out, what does this equal? **Harrison:** Uh… one over a hundred? **Lester:** Yes. So write that down. Okay, now what is the reciprocal of that? **Harrison:** Uh… **Lester:** Do you know what a reciprocal is? **Harrison:** Can you explain it? **Lester:** It's like when you flip the numbers. **Harrison:** A hundred over one.

Discussion

Interaction between Mathematical and Social Tendencies

Lester was more willing to take risks and engage with mathematics in productive ways when his peers were not present. One-on-one, Lester was more receptive to Zach's teaching and Zach was able to use diagrams, visuals, and other research-based supports to support Lester's thinking. Lester responded positively when Zach used verbal praise and encouragement to create a caring environment where Lester felt supported (Hord et al., 2016; Rodis et al., 2001). It is likely that Lester's struggles with anxiety were minimized because of the rapport he and Zach built, as evident from his willingness to work through challenging problems, even when he was unsure of his mathematical thinking. Lester thrived when he was not overwhelmed by social and academic anxieties. With the university faculty present, Lester was even more focused on being productive which provided opportunities for Zach to push Lester even further academically.

In situations where his peers were present, Lester seemed to be preoccupied with perceived peer acceptance (Grills-Taquechel et al., 2010). It is possible he experienced anxiety about making mathematical mistakes in the classroom because of the social appearance he wanted to uphold (Lambert, 2015). While he was willing to take mathematical risks and challenge himself to work hard when on-on-one with Zach, Lester became defensive and made excuses about mistakes when working with his peers. In a group tutoring situation, Lester's focus on being a comedian and seeming "cool" in front of his peers seemed to take priority over his interest in learning as both a strategy for maintaining his social status as well as coping with anxiety associated with mathematical struggles as a student with LD (Nelson & Harwood, 2011).

Due to the amount of influence peers tend to have on middle school-age students (Wentzel, 1998), it is essential for researchers and practitioners to pay close attention to how students interact with one another. Although Lester's preoccupation with peer perceptions caused him to prioritize mathematics learning beneath social concerns, Zach was able to recognize the patterns in Lester's mathematical and social tendencies and make instructional adjustments such as incorporating competition. Recognizing how students like Lester interact within groups can give insight into students' social motivations and how peer relationships connect to academic experiences (Hicks, 1997; Lambert, 2015).

Adapting Instruction Based on Student Tendencies

In many teaching situations, one of the most fundamental ways teachers can support students with LD to be academically successful is through care and understanding (Rodis et al., 2001). However, as with Zach and Lester, understanding student experiences is challenging and requires recognition of tendencies across situations. Although teachers cannot control all aspects of their students' educational experiences, it is crucial to understand that the emotional and social dynamics students bring into the classroom can influence learning (Lubienski, 2000); holistic approaches toward observation of student behavior have potential to inform classroom practice. When teachers have an understanding of student behaviors and tendencies, they may be better able to create classroom environments that support

students socially and emotionally, which can in turn lead to academic success. For example, a teacher may notice that a student seems hesitant to participate in class. After further investigation, the teacher may determine the student is concerned about how answering a question incorrectly in front of her peers may affect her social status. To create a caring environment that encourages the student, the teacher may choose to walk around the room while students are working, notice when the student has correctly solved a problem, and ask in advance if she would be okay sharing her work with the rest of the class. Simple strategies that support the social and emotional experiences of students with LD have the potential to increase academic confidence and success.

When working with Lester, Zach's ability to recognize both Lester's mathematical and social tendencies enabled him to gain a deeper understanding of Lester's learning experience. Zach was able to use strategic teacher moves, such as creating a caring environment, instilling a sense of purpose behind the work, and using competition, to motivate Lester to be productive in each situation. These techniques allowed Lester to more fully engage in the mathematics tutoring, which likely increased his sense of belonging within the mathematics classroom (Hackenberg, 2010), despite his challenges with having LD in mathematics. Combined with using research-supported interventions to support Lester as a student with LD in mathematics (for review, see Marita & Hord, 2017), Zach used his rapport with Lester to establish an environment where he felt listened to, understood, and empowered to be successful with mathematics. Though many teachers have 25-30 students in each class, making connections with individual students can be critical. By expressing interest in the trends, priorities, and cultures their students experience, teachers can show their students that they are not only invested in their academic successes, but their personal growth and well-being as well.

While not all students will demonstrate situational behavior changes as drastic as Lester, student behavior will often vary between contexts as social motivations and other factors fluctuate. Similarly, other students will not necessarily have the same tendencies as Lester. However, the ways in which individual students' behavior changes can be valuable for teachers to notice and make corresponding instructional adjustments that promote positive academic behaviors and encourage academic success. Communication between general education teachers of different subjects and between general education teachers and intervention specialists can give insight into the tendencies of students in various situations. For example, if the science teacher notices that a student is disrupting class by starting side conversations with peers during class, they may choose to discuss with other teachers to see if the issue persists across settings. If the other teachers do not observe similar behaviors, the science teacher may choose to look into the antecedent, or what may be happening before the disruption occurs, to determine what may be the cause of the behavior and if something can be done to prevent the disruption. Likewise, if teachers are observing a behavior across settings, they may choose to implement an intervention throughout the school day, and consistency between educators would be essential.

Limitations and Implications for Further Research

We focused on a microanalysis of six sessions with one participant with the intention of gaining insight into the how his tendencies were influenced by situational changes. While our findings have provided insight into some aspects of the participant's learning experience, there are limitations. While this level of analysis provided rich data about the participant, we could only provide snap shots of our time with Lester; we were unable to truly share the abundance of qualities that make this participant unique. While this article adds to the field by taking a holistic perspective of the participant's learning, generalizability is limited. Larger studies that include more participants over longer periods of time as well as single-case design studies that evaluate how effectively interventions support students socially, emotionally, and academically are needed to confirm and extend our findings.

While we were able to work with Lester during weekly tutoring sessions, there were a variety of other situations and environments within his school day that influenced him to which we simply did not have access. This project only allowed us to gain data during mathematics tutoring and limited our findings to his tendencies within these situations. We were able to observe the differences in Lester's tendencies between the tutoring situations, but were unable to determine a baseline of what his behavior would have looked like without Zach's support strategies to more objectively evaluate the impact of the strategies on Lester. We also acknowledge there are other components, such as race and culture, which contribute to a learner's experiences; however, these factors were beyond the scope of this study. Though research suggests factors such as anxiety, classroom climate, and peer influences impact the learning of middle school students (Ashcraft & Krause, 2007; Hackenberg, 2010; Hicks, 1997; Wentzel & Caldwell, 1997), we can only infer about the participant's feelings and motivations. This study reflects our most complete interpretation of the participant's experiences within the tutoring context; however, data can always be interpreted differently from various lenses. Future researchers should include more directed interviews with participants and more generalized observations.

The fields of special education and mathematics education research have identified and successfully targeted the specific academic difficulties where students with LD tend to struggle (for review, see Marita & Hord, 2017). To expand upon this existing research, we encourage researchers to conduct studies that focus on how students with disabilities' tendencies and experiences are shaped by the situational contexts of the classroom. In addition, there is a need for behavioral studies that explore how interventions that target the interaction between the social, emotional, and academic needs of students with LD can impact learning and classroom experience. Our study adds to the larger body of literature by recognizing the subtle influence of factors such as anxiety and peer relationships on the learning of all students, but especially students with LD. More research aimed at deepening our understanding of the experiences of students with LD and the role context plays is needed to better serve these individuals. As teachers develop deeper understanding of their students' experiences, instruction can be adapted to better meet their needs.

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