Connecting Basic Psychological Needs and Assessment:
Perspectives of Postsecondary Students with Dyslexia

Lauren D. Goegan[1]
Patti C. Parker[2]
Lia M. Daniels[2]

Abstract

Students with learning disabilities (LD), such as dyslexia, are at a greater risk of not completing their post-secondary education compared to their peers. Completion broadly and success more generally rest on how students navigate assessment experiences during postsecondary education. Generally, assessment is viewed as a controlling practice. From a self-determination theory (SDT) lens, highly controlling elements of schoolwork frustrate rather than satisfy students' basic psychological needs. Importantly, satisfaction, rather than frustration, supports intrinsic motivation and wellbeing. The current study examines the experiences of classroom assessment as satisfying or frustrating for students with dyslexia through an online methodology involving both Likert questions and written responses to structured open-ended questions. Overall, when students reported basic psychological need satisfaction, they likewise indicated that they received higher grades and felt more successful. From the open-ended data, we extracted three main themes and 12 sub-themes from the interviews: (a) student characteristics (including dyslexia, effort, prior knowledge, and emotions), (b) the role of others (including help, demeanor, structure, and choice), and (c) outcomes (including grades, knowledge and skills, reactions, and future impact). Taken together, when students experience classroom assessment in a way that supports their basic psychological needs, they experience better outcomes (e.g., high grades and perceived success) than when their basic psychological needs are frustrated. We discuss these results in terms of suggestions for instruction and assessment.

Keywords: learning disabilities, dyslexia, assessment, self-determination theory, postsecondary education,

Introduction

Students with learning disabilities (LD) are growing in number at postsecondary institutions (Richardson, 2021). Nevertheless, it is well documented that students with LD are significantly less likely than the general student population to complete their postsecondary degrees (Cortiella & Horowitz, 2014), a reality that is at least partially linked to academic challenges related to their performance on classroom assessments. For example, students with dyslexia, a common LD, read more slowly than their peers (Hatcher & Colleagues, 2002), and thus timed assessments on which their performance has meaningful implications for their progress through school may not adequately capture their learning. The most common approach to remedying this disadvantage during classroom assessment is to ensure that students with dyslexia are appropriately accommodated so that their performance is not adversely affected (McGregor, et al, 2016). Accommodations can begin early in schooling, and some students report being better accommodated in college than they were in high school (Bolt et al., 2011). However, these accommodations also come with the need for self-disclosure and self-advocacy, stressors that can compound the already stressful process of classroom assessment. As such, although accommodations are important for helping students with dyslexia perform better on assessments, they may do little to address some of the underlying functions of assessment. Thus, the purpose of the present study is to explore the experiences of classroom assessment practices for students with dyslexia from a motivational perspective.

[1] University of Manitoba; [2] University of Alberta

Dyslexia

We focus here on dyslexia as individuals with dyslexia comprise the largest subgroup of individuals with LD (Richardson, 2021). Dyslexia has neurobiological roots and affects the region of the brain that processes language (Mayo Clinic, n.d.). Dyslexia is not a developmental lag that can resolve, but is a diagnosis that is enduring (Shaywitz et al., 2020). As such, postsecondary students with dyslexia continue to struggle with a variety of cognitive abilities such as phonological awareness, working memory and processing speed, all of which require more effort in their postsecondary pursuits (Hatcher & Colleagues, 2002). Indeed, students with dyslexia report various academic barriers such as high levels of stress and anxiety, time requirements, managing academic demands, and a lack of resources and support (Lambert & Dryer, 2018; Richardson, 2021). Another challenge in postsecondary settings is that LDs, such as dyslexia, are often "hidden" and unknown to educators unless disclosed by the individual. Thus, students with LD are often misunderstood (Janiga & Costenbader, 2002) and indicate more challenges with university-related assessment such as tests, assignments, essays, and labs, and less satisfaction in their university experience (McGregor et al., 2016; Richardson, 2021). As such, we draw on Self-Determination Theory (SDT) as a perspective to understand the psychological perspectives on the experiences of students with dyslexia during classroom assessment.

Self-Determination Theory

SDT (Ryan & Deci, 2017) is a well-known and empirically supported theoretical framework on human motivation. According to SDT, people function best when they experience intrinsic motivation, which originates from the self and is rooted in volition and choice (Deci & Ryan, 2000). For students, the benefits of intrinsic motivation are well documented and associated with pleasant emotions, creativity, and persistence (Ryan & Deci, 2017). However, intrinsic motivation is not always possible and SDT explains that there are a variety of forms of externally regulated motivation, the most external of which is extrinsic motivation. Extrinsic motivation is typically experienced when individuals feel pressured by someone or something to act, feel, behave, or think in specific ways or to avoid certain outcomes (Ryan & Deci, 2000). Following from these two definitions, assessment can be typically classified as a form of extrinsic motivation that is used to compel students to attend class, do work, and study (Deci & Ryan, 2016).

There are several environmental variables that can impact the extent to which students are intrinsically or extrinsically motivated. In particular, three basic psychological needs (BPNs) are posited in SDT, that when satisfied or frustrated, can either promote or hinder performance, perseverance, and well-being via intrinsic motivation (Deci & Ryan, 2014). The need for *autonomy* is satisfied when a person's behaviour is congruent with their personal interests and volition and frustrated when they are not given the choice to behave in some way (Vansteenkiste et al., 2020). The need for *competence* is satisfied when a person feels capable or effective in their behaviour engagement and frustrated when they feel ineffective (Niemiec & Ryan, 2009). Finally, the need for *relatedness* is satisfied when a person feels they are connected to others or belong to a social group and frustrated when they feel excluded or that they do not belong (Vansteenkiste et al., 2020). In the classroom, students thrive when they feel competent and autonomous in their learning environments, and feel connected, valued and a sense of belonging (Niemiec & Ryan, 2009; Vansteenkiste et al., 2020). This sense of need satisfaction, however, seems to be particularly compromised during classroom assessment when university students report at best moderate levels of satisfaction (Daniels et al., 2021). Given the benefits of need satisfaction and intrinsic motivation, understanding how students with dyslexia experience need satisfaction and frustration in relation to classroom assessment could open new avenues for support.

SDT, Assessment and Student Success

Although it is rarely stated explicitly, instructors tend to use assessment practices as a way to extrinsically motivate students to work and learn (Deci & Ryan, 2016). When instructors use classroom assessments to compel students to learn specific content, behave a certain way, or receive a particular reward such as an "A", they tap into students' extrinsic motivation. Students who are extrinsically motivated often get good grades, perhaps suggesting that using assessment this way indeed helps students' performance (Ratelle et al., 2007). However, researchers have also shown that extrinsic motivation is associated with reduced valuing of certain activities (Deci & Ryan, 2008), lower interest and enjoyment in the task (Ryan & Deci, 2000), and less persistence (Vansteenkiste et al., 2020). As much as students with dyslexia already struggle with enjoyment, persistence, and interest (Goegan et al., 2019), assessments that serve extrinsic functions may be particularly damaging to the efforts they rely on daily to be successful in postsecondary education.

Although teachers perceive students as more extrinsically than intrinsically motivated by assessment,

they also acknowledge that it is possible to make assessment more intrinsic (Daniels et al., 2021). Daniels and colleagues (2021) suggest that assessment decisions can be made "to support students' basic psychological needs with the intention of cultivating intrinsic and minimizing extrinsic motivation" (p. 118). Their data currently show that students in general do not feel their BPNs are supported by various assessment practices, and in particular the need for relatedness is in short supply during assessment. Basic psychological need satisfaction may be even rarer for students with dyslexia who report a wide range of support and resistance from instructors in terms of providing appropriate accommodations for assessments (McGregor, et al., 2016; Richardson, 2021).

When BPNs are satisfied, students tend to perform better in terms of grades (e.g., Mohamedhoesein & Crul, 2018). This may also be true for students with dyslexia, although the literature is silent on it. However, grades are not the only indicator of academic success (e.g., Goegan et al., 2020). Indeed, students offer various objective (e.g., grades, retention) and subjective (e.g., perceived success, perceived engagement) indicators when asked about success at postsecondary (Zepke & Leach, 2010). This is also likely true for students with dyslexia, particularly if objective test scores appear to not align with their subjective sense of learning or success. Since we are interested in the classroom assessment experiences of students with dyslexia and how they feel supported or frustrated in those experiences, we consider two indicators of academic success as outcomes in our study: (a) self-reported GPAs and (b) perceptions of academic success.

Basic psychological needs and students with LD. Little research has explicitly asked students with dyslexia about the satisfaction or frustration of their BPNs in postsecondary settings generally, never mind in regard to assessment. However, the concepts of relatedness, autonomy, and competence can be inferred within the existing literature on students with dyslexia in postsecondary (MacCullagh, 2014). For example, Madriaga (2007) conducted interviews with students with dyslexia in the UK and found that students reported having limited resources available to help them make decisions about their higher education choices. Likewise, in another interview study, Griffin and Pollak (2009) found students with various learning differences, including dyslexia, reported feeling frustrated when trying to navigate the right services and resources in postsecondary education. Although not examined from a SDT lens, these results may point to instances when students' needs for *autonomy* are not met. Likewise, when students advocate for the types of accommodations they need,

research suggests instructors can respond supportively or uncooperatively (Ryan, 2007), and as such, support or frustrate autonomy.

Several studies identify assessment experiences where students with LD including dyslexia do not feel their need for *relatedness* was met. For example, they report feeling negative attitudes from lecturers or other staff (Griffin & Pollak, 2009) and misunderstood and discriminated against compared to their peers (Kurth & Mellard, 2006; McGregor et al., 2016). Moreover, Doikou-Avlidou (2015) found that not only did students with dyslexia perceive negative attitudes from their teachers, but also admitted being teased by their peers in secondary and postsecondary education. These experiences contributed to the students' anxiety and feelings of inferiority (Doikou-Avlidou, 2015) and from a SDT lens would certainly frustrate relatedness.

Research on students with dyslexia also reveals instances that can be interpreted as satisfying or frustrating their need for *competence*. For example, compared to their peers, students with dyslexia report having greater trouble with assessment-related tasks such as note-taking, organizing essays, and expressing their ideas when writing (Fuller et al., 2004; Mortimore & Crozier, 2006). They expressed other challenges such as not adequately preparing for higher education and lacking confidence in the staff and students to understand what they require (Madriaga, 2007). Madriaga (2007) suggests some of these challenges may be contributing to the low engagement rates of students with dyslexia in higher education. More generally, compared to those without a history of reading difficulties, students with such a history indicated lower academic-related self-efficacy and greater anxiety at the beginning of university (Elgendi et al., 2021). Additionally, students with LD at an Australian university felt they had to put in a lot more effort compared to their peers to attain equivalent achievement results (Ryan, 2007). More directly, Costello and Stone (2012) advocate that accommodative strategies such as instructors providing comments in their syllabi, inviting students to notify them about accommodations they require, creating syllabi with clear course objectives and deadlines, providing helpful study outlines for testing materials, and giving guided modeling of learning strategies, practice of strategies, and instructional technology (Allsopp et al., 2005; Parker & Boutelle, 2009) will foster a sense of competence and self-efficacy.

Rationale for the Current Study

Because assessment practices are in many ways at the core of successfully completing postsecondary

education, it is important to understand the experience of classroom assessment for students with dyslexia. Although this experience is most commonly studied through the provision and effectiveness of accommodations (e.g., McGregor et al., 2016), we expand this conceptualization recognizing that the experience of assessment may be very different when it satisfies or frustrates BPNs. As such, we wanted to give students with dyslexia a voice in how they experience assessment practices at their postsecondary institutions. Moreover, we recognize that success can take many forms, and explore it from multiple measures, such as grades and perceptions of success.

We address three research questions to bring a multi-method approach to this research problem. Our quantitative questions were: (1) Are students' BPNs of competence, autonomy and relatedness generally supported or frustrated through assessment in their programs of study? and (2) Do students' perceptions of their success and final grades statistically differ when assessment satisfies or frustrates their BPN? Our qualitative question is: How do students with dyslexia describe assessment experiences that satisfy or frustrate their basic psychological needs?

Method

We used a multi-method approach in this study with quantitative and qualitative data collected simultaneously but anchored to different research questions. The main study design consisted of six conditions that crossed the two levels of satisfaction (satisfaction x frustration) by the three BPNs (competence x relatedness x autonomy). Likert scale and open-ended data were collected concurrently with all participants responding to all questions attached to six matched conditions.

Procedures

Some of the challenges associated with recruiting students with learning disabilities to participate in research may be overcome by turning to online recruitment forums like Prolific. However, we had to balance gains in terms of recruitment ease with the logistics of creating an online research experience that could gain in-depth written responses. Therefore, to enhance the conversational nature of the design, the survey welcome page included typical information about the study and consent as well as a picture of the researcher, a disclosure statement that she too has dyslexia, and direct statements about desiring to build rapport and "mimic" an in-person interview for the open-ended written responses. Interested and eligible participants clicked the link in Prolific to be taken to the study where consent was implied by participation.

After the welcome, participants moved back and forth between Likert scale questions and open-ended written responses linked to competence, relatedness, and autonomy separately (see Figure 1). First, participants answered a baseline BPN Likert question representing the condition. Second, participants provided open-ended responses to the condition prompt such as "I want you to tell me about a time when [you felt really competent by assessment]." Third, for

Figure 1

Overview of Multi-Method Procedure and Analyses
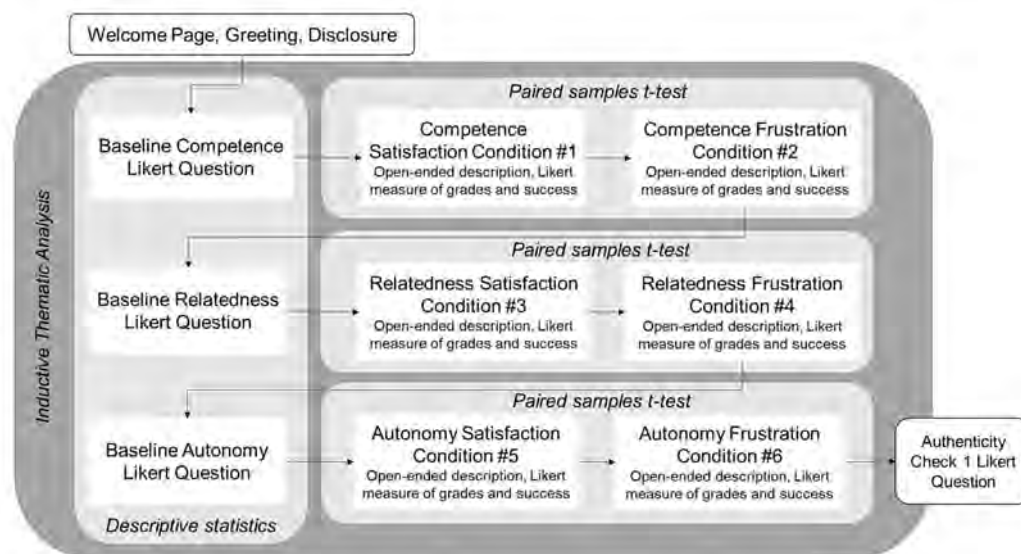
the same condition they responded to two additional Likert-scale questions measuring grades and perceived success. This process was repeated six times, once for each condition. Participants responded to all conditions in the same order. After all the conditions, participants indicated how authentic they felt the experience was via one Likert question. In total, participation required approximately 45 minutes. At the end of the survey, participants were paid based on the Prolific guidelines for participant compensation (Prolific, 2021). In total 126 people clicked the Prolific link of which 26 stopped the survey within the first few questions. In total, we were able to recruit 100 participants with dyslexia in less than 12 hours with essentially full data.

Participants

Of the 100 postsecondary students who self-identified as having dyslexia and chose to participate, 71 identified as men, 27 as women, and 2 as non-binary. Participants ranged in age from 18 to 46 ($M = 21.67$, $SD = 4.11$) and represented both undergraduate ($n = 64$) and graduate ($n = 32$) students ($n = 4$ did not indicate). Twenty-six students were in their first year, 22 in their second, 26 in their third, 14 in their fourth, and 12 in their fifth year or higher of their postsecondary program. Students were registered in a variety of faculties including Arts, Business, Education, Engineering, Graduate Studies, Law, Science, and Social Sciences.

Measures
Quantitative Measures: Course Descriptive Information

When a BPN was introduced, participants completed a single likert-scale item that asked them the extent to which the assessment practices in their academic program overall made them feel (a) competent (b) supported or (c) in charge, on a 1 (not at all) to 10 (completely) scale (three questions in total). Then, participants completed a set for structured interview questions (described below), for the associated satisfaction and frustration version of that BPN. After completing each set of questions, participants provided self-report data on their perceived success and grades for the course they described for those questions. Students indicated how successful they felt in the need-satisfied and need-frustrated course on a scale from 1 (Not at all successful) to 10 (Completely successful). Students then self-reported what their final grade was in the course, again separately for need satisfaction vs. frustration for each BPN, by selecting one of the following: A/A+, A-, B+, B, B-, C+, C, C-, D, F. We converted these letter grades into a 4.0 scale. This information was collected separately for all six conditions, resulting in an additional 12 quantitative, likert-scale items.

Qualitative Measures: Structured Interview Questions

Participants responded in writing to structured interview questions for the six conditions asking about their experiences of classroom assessment as satisfying and frustrating (2 levels) and their BPNs of competence, relatedness, and autonomy (3 levels; see Figure 1). The instructions urged participants to "take some time before you start writing to remember this experience in detail" and then six separate questions for each of the conditions with their own textbox were written as interview questions to guide participants in providing a full description of the situation. To encourage in-depth responses, participants were instructed to spend 7-8 minutes answering the questions. The six conditions were presented in the same order to all participants.

Authenticity Check

After completing the qualitative and quantitative items for six conditions, students were asked "As you made your way through this, how much did you feel you were able to share your story with me?" and rated the item on a scale from 1 (not at all) to 6 (completely).

Rationale for Analysis

Qualitative and quantitative data were analyzed at the same time; however, we describe the quantitative results by condition before turning our attention to the qualitative results which were examined across all conditions. For each condition, we calculated the mean of the baseline BPN question in order to describe students' general levels of need satisfaction in relation to assessment (quantitative research question #1). Then, we used paired samples t-tests to compare students' self-reported grades and perceptions of success under the satisfied and frustrated conditions (quantitative research question #2).

Before beginning the qualitative data analysis, we checked participants' scores on the authenticity question to determine how fully participants engaged with the structured interview process. Following this, we undertook an inductive thematic analysis for the open-ended written responses (qualitative research question; Thomas, 2006). We began with the responses in which students described their need for competence being satisfied which resulted in 10 discrete codes. We then used those codes to guide the inductive analysis of the matched condition in which competence was frustrated and found that no new codes were needed. We repeated this process for the condition of relatedness satisfaction resulting in one

code being removed and three codes being added that better described all three sources of data thus far. We used the 12 codes to analyze the conditions of relatedness frustration, autonomy satisfaction, and autonomy frustration and they adequately described responses without any further code modifications. The 12 codes mapped onto three themes.

Results

Quantitative Results
Competence Condition

Seventy-five percent of students indicated a score between 5 and 8 on a scale from 1 (not at all) to 10 (completely) that overall, assessment practices made them feel competent ($M = 6.27$, $SD = 1.79$; range = 1-10, skewness = -.52). Students reported statistically significantly higher grades and more success attached to assessments that satisfied rather than frustrated their need for competence. See Table 1 for descriptive statistics and *t*-test results.

Relatedness Condition

Sixty percent of students indicated a score between 1 and 6 in terms of feeling supported in their learning as an indication of relatedness ($M = 5.69$, $SD = 2.13$, range = 2-10, skewness = -.05). Students reported statistically significantly higher grades and more success attached to assessments that satisfied rather than frustrated their need for relatedness.

Autonomy Condition

Sixty percent of students indicated a score between 5 and 8 regarding how in charge they felt of their learning as a measure of autonomy ($M = 5.69$, $SD = 2.28$, range = 1-10; skewness = -.16). Students reported statistically significantly higher grades and more success attached to assessments that satisfied rather than frustrated their need for autonomy.

Qualitative Results
Authenticity Check for Qualitative Interview Questions

The mean for participants' responses to the authenticity question was 4.60 out of 6 ($SD = 1.31$, range = 1-6, skewness = -.91). Moreover, over 80% of participants reported a 4 or higher indicating they felt quite comfortable sharing their assessment stories with the researcher through this online structure.

Thematic Analysis of Students' Experiences

Twelve discrete codes were identified as belonging to three overarching themes describing students' experiences of assessment in terms of their BPNs:

student characteristics, the role of others, and outcomes (Figure 2).

Student Characteristics. While reflecting on their experiences with assessment, several students mentioned ways in which their diagnosis of ***dyslexia*** itself impacted how their needs were satisfied or frustrated. Participants described how the provision of accommodations helped their basic psychological needs be satisfied stating things like "when studying I use google speech, auto correct and text to voice as I struggle to read and spell..." and how lack of accommodations worked against their needs with statements such as "she [the instructor] would often not give me extra time even though I was allowed to take that..." Students also reflected on how teachers' and students' responses to them being a student with dyslexia fit with their BPNs. For some students this was damaging with comments like "because of my dyslexia they think that I am stupid," or "a specific instructor told me that he does not believe dyslexia exists it is only for the dumb students to get beneficial treatment," and "she [the instructor] would always treat me different than other kids, which made me feel even more incompetent and dumb." But some students reported instances of support such as: "once there was a teacher who saw I was struggling [with an assessment] and just told me it's okay and that he knows it's hard because I have dyslexia."

Diagnosis aside, participants reflected on the ***effort*** they put into their assessments and how that was part of need satisfaction or frustration. For example, students said "I worked really hard to have a good grade and to understand everything," and "[effort was] very tiring and time consuming, but it was really worth all the struggle" and "trying to do the calculations on my own, with the help of books" as instances of satisfaction. At times, however, the investment of effort was just not enough and left students feeling depleted in terms of needs: "I studied 3 weeks straight for a test and didn't have a good grade" and "no matter how much I tried I couldn't figure it out." Effort was not just a solitary activity with students describing collective good such as "we all studied together" and hardship for their effort such as "I had to sacrifice a lot of my free time to catch up with my studies." Moreover, effort was often modulated based on students' ***prior knowledge***. For example, one student explained that "I happened to read a book, before I started my studies, that partially covered that subject. That allowed me to actively take part in the discussion during our lecture" as an example of need satisfaction. In contrast, a lack of previous knowledge was additionally frustrating: "I was afraid she would ask me about something I don't know and I will look like I'm stupid and I am not smart enough to learn such things."
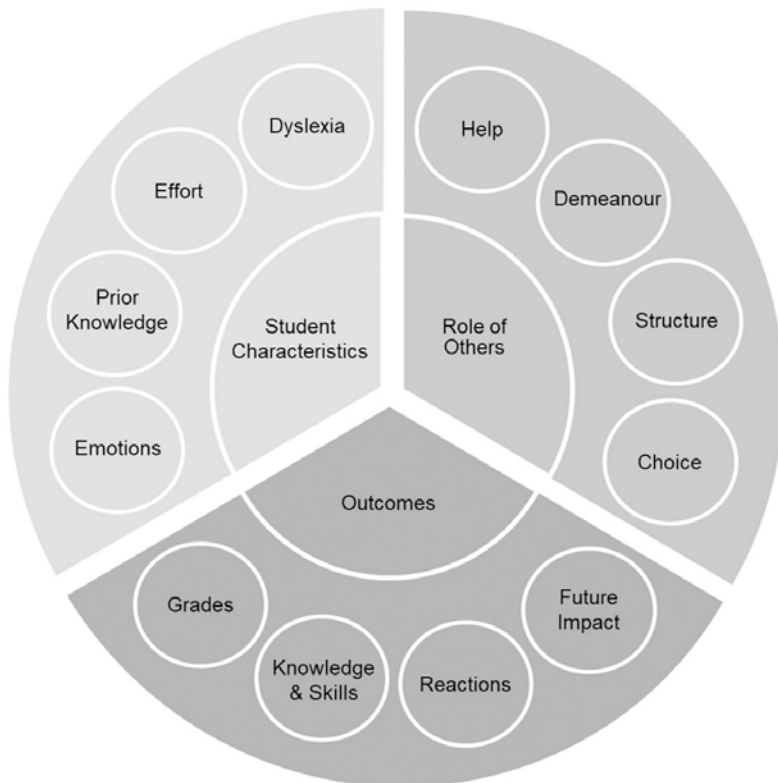
Table 1

Descriptives and Paired t*-tests*

	Satisfaction		Frustration		
	M	*SD*	*M*	*SD*	*t*-value
Autonomy					
Grade	3.48	.52	2.54	1.11	7.02***
Success	7.79	2.08	4.53	2.54	9.34***
Competence					
Grade	3.42	.56	2.28	1.02	10.03***
Success	7.73	1.77	3.98	2.44	12.48***
Relatedness					
Grade	3.22	.71	2.37	1.05	6.60***
Success	7.46	2.05	4.45	2.50	9.68***

Note. * *p* < .05, ** *p* < .01, *** *p* < .001.

Figure 2

Themes from Thematic Analysis

Finally, students identified various *emotions* connected to assessment and basic psychological needs. The ten most frequent pleasant emotions students described in regards to assessment were: happy, proud, good, excited, joy, confident, relief, calm, content, and satisfied and the ten most frequent unpleasant emotions were: sad, anger, frustrated, bad, annoyed, disappointed, stress, upset, mad, and embarrassed. Students reported their needs were easier to satisfy when they felt interested in the assessment process. For example, students commented that they felt satisfied when "I was researching something interesting" or "I really like doing group work" and "we were assigned to work on a short film, which is what I love doing." When needs were frustrated often the assessment task itself was critiqued such as seen in statements like "I don't really like writing."

The Role of Others. Students saw their assessment experiences as being influenced by other people. For example, students often spoke of ways they sought *help* regarding assessment from instructors, tutors, or peers. Although help was central to the assessment experience, it was not always forthcoming. For example, one student said "[the instructor] responded to all my emails, which were a lot, let me just say that, and always did his best to help me," whereas another student said "I asked my teacher for help but he said he didn't have time to explain it again." When help came proactively, students saw this as building a sense of relatedness through statements such as "I felt really supported while [the instructor] asked me if I need help." Sometimes participants commented directly on the *demeanour* of others and how that fit with their assessment experience. For example, one student commented that "[the instructor] just was really friendly and made me more and more excited about the assessment," whereas another student said "it wasn't just me, the teachers dismissed us and almost said we were lazy for not studying."

Students also recognized that instructors hold a role in their assessment experience through the *structure* of the course and assessments. Students differentiated parts of course lectures that supported their learning such as "writ[ing] everything on the board" from parts that inhibited their learning such as "lessons [that are] all over the place and [students] essentially had to guess what to learn for [themselves] from the internet." For assessments, participants valued instances when "the instructor uploaded a lot of things which we can study from" and when instructors undertook any number of actions to try and maximize their competence such as getting a "bonus on the final exam" when they participated in lectures, being able to "drop the lowest assignment grade from the grade-

book," and "guiding class through working examples that would make an appearance in the exam." Participants also explained how lack of structure such as "vagueness with how [material] is taught and the criteria for mark[ing] schemes" negatively impacted their sense of competence.

In a similar vein, the amount of *choice* students experienced was related to the pleasantness of their assessment experience. When instructors provided students with choice, it largely had a positive impact as seen through statements such as "I had the freedom to choose when I took the test," or "I had the freedom to do research and write on my own time, and to organize the paper however I wanted," and "the assessments were very open-ended and they allowed me to choose my own path to the necessary conclusion." In each of these examples, the assessment was seen more positively than when choice was lacking through statements such as: "I didn't have a choice in how I wanted to learn stuff."

Outcomes. Students described a range of achievement outcomes as part of their need-supportive or frustrating experiences. Many of these descriptions were related to performance as indicated by *grades*. Participants seemed to feel their needs were met more when they "got a good grade on the test," "got a high mark" or "did very well" and they were more frustrated when they "almost failed," or "my marks weren't that great." Sometimes this focus was also comparative with students experiencing additional satisfaction when they outperformed their peers through statements such as, "only 10% of those who take the exam stay and I was one of that 10%," and frustrating when they struggled more than others such as "I was the only one in the class to fail the first two tests" and "I got one of the worst scores of anyone." The actual percentages or letter grades attached to these sentiments varied widely reinforcing that no specific letter grade or percentage is sufficient to indicate success or to meet BPNs.

Participants also reflected on their overall *acquisition of knowledge and skills* throughout the course as contributing to satisfaction or frustration. Students shared statements such as "I think I learned a lot during the course" or "I understood the concepts really well" when they felt their needs were satisfied. The opposite was the case when needs were frustrated with participants reporting that "sometimes I can't understand the topics" or "I came out of it with absolutely no knowledge."

Finally, participants also saw others' *reactions to their performance* as a type of outcome from assessment. For example, students often noted praise (e.g., "received a lot of praise and many people close to

me w[ere] proud of me"), compliments, (e.g., "compliments from my peers, family and professors") and feedback (e.g., "feedback confirmed that I'd done it well") as contributing to need satisfaction. Alternatively, students reflected on how inconsiderate responses to their performance on assessments frustrated needs such as "during our presentation, the professor laughed at us" or "my classmates started laughing and making fun of me."

These outcomes were further contextualized in regard to their *future impact* on students' beliefs and actions. When assessment experiences aligned with need satisfaction, they had positive implications for the future through statements such as "it [need satisfaction] gave me a lot of confidence and hope that I could deal with future assessments," and "hopefully next year I can stay on top of my work." Such experiences also supported their sense of belonging at postsecondary through statements such as "I finally belonged somewhere" and "it gave me the validation that I was in the right place." Nonetheless, participants knew this optimism was contingent on the learning and assessment conditions they experience in the future: "a bad advisor can make an assignment much more difficult than it needs to be" and "assessments don't care about your feelings, but people/teachers can definitely help with that."

Discussion

In the discussion we weave back and forth between the quantitative and qualitative results to make sense of dyslexic students' experience of classroom assessment as need satisfying and frustrating. We highlight three main findings before discussing the limitations and directions for future research. First, the need for relatedness appears to be particularly poorly satisfied during classroom assessment. Second, although participants' open-ended descriptions of their experiences with assessment differed by directionality (i.e., negative, or positive), not by theme, the negative components within each theme are concerning not only for their success in school but for their wellbeing. Finally, students with dyslexia were more likely to report good grades, perceived success, and positive open-ended experiences of assessment when responding to the three need-satisfied conditions than the need-frustrated conditions and thus need satisfaction in assessment should be a priority for teachers.

Lack of Relatedness in Classroom Assessment

The majority of participants did not rate relatedness high in their assessment experiences. The importance of encouraging and building relatedness in the classroom in terms of instruction and motivation has been acknowledged generally (Furrer et al., 2014) and for students with dyslexia specifically (Goegan et al., 2019); however, our results suggest that there appears to be less of a priority on intentionally building relatedness into assessments. Based on the open-ended experiences of participants here, sometimes this breakdown in relatedness was directly linked to students' dyslexia diagnosis. For example, they mentioned times when their instructors acted in ways that demonstrated they were not making an effort to build connections by refusing to meet their stated accommodations or making them feel 'dumb'. In other instances, relatedness was frustrated by characteristics of assessment unrelated to students' diagnosis. For example, participants noted that during assessment some instructors were simply not helpful or supportive to anyone. Likewise, they struggled when assessment instructions were vague or the format was disorganized.

Perhaps the lack of relatedness in assessment is unsurprising because testing is often viewed as an external regulator that holds both teachers and students accountable for learning through rigorous and unbiased processes (Deci & Ryan, 2016). Such a stance feels naturally contrary to meeting students' need for relatedness during assessment. By extension, the narrative that summative assessment practices can be designed to support relatedness is perhaps more challenging than the other BPNs. The most obvious way to build relatedness into assessments is by creating opportunities for instructors and classmates to provide helpful, encouraging, and constructive feedback. Indeed, there is existing evidence that receiving some form of assessment feedback can strengthen rapport building (Allen et al., 2003) conveying the importance of satisfying relatedness needs in assessments. In addition to feedback, Daniels and colleagues (2021) suggest a variety of simple strategies that teachers can implement to maintain or enhance relatedness during assessment. These include taking students' perspectives, negotiating deadlines, and making space to acknowledge the emotion-laden reality of classroom assessment.

Insights from the Negative Narratives in Students Experiences

Although the final twelve codes were able to capture students' open-ended descriptions of instances when they felt incompetent, unsupported, and not in charge of their learning through assessment, the codes were also present in the analysis of the three "satisfied" conditions. This implies that the overarching themes of student characteristics, the role of others, and outcomes were equally relevant to students

as they reflected on instances when their BPNs were satisfied through classroom assessment and instances they were not. In other words, rather than need satisfaction and frustration being associated with different discrete experiences, it was the tone or valence of the assessment experience that differed. The consequences of negative experiences attached to a constant in schooling such as classroom assessment is worrying (Lockiewicz et al., 2014). Indeed, many of the negative descriptions from our participants in regard to assessment have been reported with schooling more broadly such as being seen as incapable because of their diagnosis (Lisle & Wade, 2014) or exerting constant but insufficient effort (Goegan et al., 2021).

Negative emotions are also frequently reported in school. Jordan and colleagues (2014) showed undergraduate students with dyslexia have more mathematics anxiety, and in turn, worrying and denial than peers without dyslexia. Our results reveal that negative emotions are not just a generic experience but directly linked to classroom assessment for students with dyslexia, as has been shown to be the case for many postsecondary students (Pekrun et al., 2004). Finally, on the quantitative questions students reported lower grades and less perceived success in classes that frustrated their BPNs, meaning that both their narrative and numeric data point to the same overall concerns for wellbeing and performance when assessments frustrate BPNs.

Optimism with Need Satisfaction

Students indicated that their self-reported grade and perceived success was on average 1.5 times higher in the BPN-satisfied conditions than when assessment frustrated their BPNs. For recalled letter grades this means that students reported getting about a B+ under assessment conditions that met their BPNs and about a C+ when assessments frustrated their BPNs. Such similarities within satisfaction and frustration conditions of competence, relatedness, and autonomy may show that students with dyslexia do not distinguish between the discrete BPNs and instead may have a more global sense of whether their needs are satisfied or frustrated by classroom assessment. Indeed, some researchers create composite scores of need satisfaction (e.g., Vansteenkiste et al., 2020) rather than focusing on each discreetly. Likewise, recommendations for autonomy-supportive interventions suggest using multiple strategies to meet all BPNs rather than focusing on one need exclusively (Ryan & Deci, 2017).

The narrative from students when assessment supported their BPNs was similarly optimistic and also not particularly distinct between the three dis-

crete needs. Students described feeling supported by their instructors' words and actions – both of which have been previously noted as contributing to success in postsecondary for students with LD (Doikou-Avlidou, 2015; McGregor et al., 2016). The description of pleasant emotions, good performance, and learning aligns with studies that show that despite students with dyslexia reporting a variety of challenges in postsecondary education (Richardson, 2021), with adequate support they can achieve similarly in college and in the workplace as their non-dyslexic peers (Shaywitz et al., 2020).

Our results show that specific attention to assessment practices from the lens of SDT can be leveraged to help students with dyslexia perform well and feel supported. Daniels and colleagues (2021) suggest several ways that SDT can be applied to summative assessment specifically. Although their recommendations were made thinking about the classroom in general, the results of this study highlight the additional possible benefits for designing assessments to meet the BPNs of students with dyslexia specifically.

Implications and Directions for Future Research

The results of this study have important implications for research design, theory, and practice. In terms of research, recruitment of students with dyslexia and other LDs is challenging (Lopes et al., 2020). We were not only able to secure a large sample of students with dyslexia through Prolific but created a structured interview format that the majority of participants confirmed allowed them to feel like they were sharing their story with the researcher. This success can be used to inform future research both in terms of recruiting students with LD for research and considering a wide range of ways to ensure research designs accommodate the needs of all participants, so that all voices are heard (Goegan et al., 2018). In future research using this design, it would be important to know if participants were able to use speech-to-text options within Prolific to more comfortably present their responses.

In terms of theory, the results of this study have important implications for SDT and BPNs. Although both theories have been used to make recommendations on instructional design in compulsory (Reeve & Halusic, 2009) and postsecondary education (Stupnisky et al., 2018), the extension through to assessment practices are less clearly articulated (for exceptions see Daniels et al., 2021; Deci & Ryan, 2016). Our results suggest that it can be used to guide the design of summative assessment. We encourage researchers working from a SDT framework to be intentional about making explicit recommendations from course

design and instruction all the way through to assessment because need satisfaction in assessment specifically appears to be beneficial for students with dyslexia and likely others.

In terms of practice, a substantial body of experimental and applied research documents that teachers can learn to be more autonomy supportive and less controlling (Reeve & Cheon, 2021). Su and Reeve (2011) showed that on average autonomy-supportive interventions are effective with a weighted effect size = .63. Moreover, they articulate a clear set of characteristics associated with effective interventions including focusing on multiple elements of need support, being relatively short, and targeting pre-service rather than practicing teachers. Administrators and teachers could seek out autonomy-supportive interventions as a form of professional development not only as it pertains to instruction but assessment as well. Given the demands of teachers at all levels of schooling, one benefit of using SDT to guide this work is that research shows small and relatively easy changes can have a large impact on students and teachers (Reeve & Cheon, 2016). Future research could not only help teachers design assessment practices that support students' BPNs, but focus on how such practices impact the wellbeing of all students as well as students with LD like dyslexia that have often struggled with assessment practices such as test-taking.

Additionally, the results of our study could inform the procedures for disability service providers in two ways. First, service providers could provide information to instructors about dyslexia, and by extension, other learning challenges students may have. This could reduce some of the negative experiences the students here report having with instructors who think they are "stupid." By providing this information, it could also help inform instructors of potential adaptations they could make to their assessment practices to support learner diversity. This is particularly important as students with LD are growing on postsecondary campuses (Learning Disabilities Association of Ontario, 2018). Second, in working with students with dyslexia specifically, service providers can look for ways to satisfy students' BPNs similar to what instructors can do. For example, in terms of the role of others, service providers can be mindful of their demeanour. Indeed, research by Paulmann and Weinstein (2022) found that when teachers speak in a controlling voice, compared to autonomy-supportive or neutral, students identify lower satisfaction of their BPNs. Moreover, evaluating the structure of services provided to students and offering choices in how they access them (e.g., in-person, or online) could also support students' BPNs. Overall, it is important for disability service providers to not only provide appropriate accommodations and supports for students, but also recognize the psychological elements attached to their experiences.

Limitations and Conclusion

As much as we consider recruitment through Prolific as a success, the platform introduced three important limitations. First, it did not allow for a dynamic conversation between the researcher and participants. On the one hand, this structure may have made it easier for participants to respond to questions easily and minimized power differentials. On the other hand, it would have reduced the ability to engage in a fulsome discussion and probe for understanding and rich narrative. For example, some students made comments beyond assessment practices as they reflected on their experiences and may have needed more explicit instruction around considering assessment practices they experienced. Future research should involve both sorts of interview methodologies and ask participants which produces better engagement in the research process.

Second, Prolific is an international platform and thus participants came from anywhere in the world and self-identified their status as dyslexic. In some ways this approach is an improvement on existing studies that include a range of LDs from small geographical regions (e.g., Fuller et al., 2004; Griffin & Pollak, 2009); however, it also poses challenges to know for certain all participants' diagnosis of dyslexia are rooted in similar deficits and diagnostic criteria (Caravolas, 2005). Even so, the use of self-report for individuals with LD more broadly, has been recognized as an effective way for identifying individuals (McGonnell et al., 2007), and the use of an online format, could have also reduced concerns with self-disclosure, as these students often do not want to self-identify due to potential stigma (Goegan et al., 2018). Overall, these students identify as dyslexic, and it is imperative to give them a voice for their experiences. Nonetheless, the survey was only presented in English and all responses were provided in English suggesting a working level of the English language was required.

Third, we know little about the specific course that participants focused on in responding to each condition. Future research should collect additional contextual information on the course content, instructional approaches, and the actual assessment practices employed.

In addition to these methodological limitations, it is important to note that we did not direct students' attention to a specific form of classroom assessment. It

is possible that their descriptions of assessment experiences that satisfied versus frustrated their BPN may have differed by the characteristics of assessments. For example, it is possible that high-stakes examinations were more often thought of in terms of needs frustration, and formative assessments were more likely the context of need satisfaction. Because we neither intentionally focused students nor asked them to explicitly describe the nature of the assessment, we are unable to comment on this particular dynamic and recognize its importance for future research.

Notwithstanding these limitations, the results of this study show that students with dyslexia have instances in which their BPNs of competence, relatedness, and autonomy are both satisfied and frustrated during classroom assessment. The underlying elements of the experience in terms of student characteristics, roles of others, and outcomes were the same when students described satisfaction and frustration, but the valence differed. In addition, students' self-reported grades and perceived success differed substantially based on need satisfaction and frustration overall suggesting that supporting teachers in designing need supportive assessment practices may have beneficial outcomes in terms of performance and wellbeing.

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About the Authors

Dr. Lauren D. Goegan received her Ph.D. from the University of Alberta. She is currently an Assistant Professor in the Department of Educational Administration, Foundations, and Psychology at the University of Manitoba. Her research interests include the transition to and successful completion of postsecondary education, often incorporating various motivational theories in her work. She can be reached by email at: Lauren.Goegan@umanitoba.ca.

Dr. Patti C. Parker received her Ph.D. from the University of Manitoba. She is currently an Assistant Professor in the Department of Psychology at Thompson Rivers University. Her research interests include motivation and psychosocial factors in a variety of populations and settings (e.g., education, sport, health). She can be reached by email at: pparker@tru.ca.

Dr. Lia M. Daniels received her Ph.D. from the University of Manitoba. She is currently a Professor of Educational Psychology at the University of Alberta

and the Director of the Centre for Research in Applied Measurement and Evaluation. Her research interests focus on student and teacher motivation and emotions across all levels of schooling with the intention of creating supporting learning environments. She can be reached by email at: lia.daniels@ualberta.ca.