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Pre-Service Teachers' Causal Attributions about FASD and Their Teaching Self-Efficacy

by

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Abstract

Children with Fetal Alcohol Spectrum Disorders (FASD) often display complex problem behaviours in the classroom. The purpose of this study was to examine how pre-service teachers' attributions about the problems associated with FASD relate to their self-efficacy for working with affected children. Data were collected in the fall of 2009 and 2011 from 157 pre-service teachers studying at a Western Canadian University. Data were analyzed using multiple regression analyses to determine the extent to which four predictor variables (locus of causality, stability, personal control, and external control) predicted self-efficacy. Results revealed that stability and external controllability were significant predictors of teachers' self-efficacy in working with children with FASDs. The extent to which a teacher expects to implement interventions for these children in the classroom also predicted self-efficacy. Results are discussed in relation to the development of an attributional retraining program to correct misattributions about FASD and foster teacher self-efficacy.

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Introduction

Fetal Alcohol Spectrum Disorder (FASD) is an umbrella term used to describe a number of disorders and syndromes that result from maternal alcohol consumption during pregnancy (Mukherjee, Hollins, & Turk, 2006). Approximately 1/100 children born in Canada are affected by an FASD, making it the leading national cause of developmental and cognitive disability (Canadian Pediatric Society, 2002; Stade et al., 2009). Prenatal exposure to alcohol has life-long implications for affected children, their families and caregivers, and the community due to the effects that this teratogen has on the developing brain (Chudley et al., 2005; Streissguth et al., 1994).

As the term "spectrum disorder" implies, children with prenatal exposure to alcohol can exhibit a range of symptoms and various degrees of impairment (Mukherjee, Hollins, & Turk, 2006). Although specific deficits in functioning can vary depending on the areas of the brain affected, researchers have found that children with FASD often experience deficits in multiple areas of cognitive functioning (e.g. cognitive flexibility, memory, processing speed, and executive functioning), as well as inattentive and hyperactive behaviours, learning disabilities, and poor social and adaptive skills (Burd et al., 2003; Jacobson & Jacobson, 2002; Kelly, Day, & Streissguth, 2000; Rasmussen, 2005). These neuropsychological deficits create a multitude of daily challenges for children with FASDs.

As a result of these deficits, children with FASD often experience a number of academic difficulties, and exhibit behaviour problems in the classroom

that can be challenging for even the most experienced teachers. Similar to their neuropsychological profiles, the learning and behavioural profiles of children with FASD can vary depending on the areas of the brain affected (Blackburn, Carpenter, & Egerton, 2010). Although not all children with an FASD have significant learning difficulties (Streissguth, Randels, & Smith, 1991), studies have shown that they are more likely to demonstrate lower overall academic achievement than their peers, and to struggle in specific academic areas such as reading, phonological processing, and arithmetic (Goldschmidt, Richardson, Cornelius, & Day, 2004; Olson et al., 1997; Streissguth, Barr, Bookstein, Sampson, & Olson, 1999). In addition, difficulties with inattention and hyperactivity, which are commonly associated with FASD, are likely to affect their ability to learn in the classroom setting. Further compounding these learning difficulties is the fact that due to their neuropsychological deficits, these children require special consideration as they may not readily respond to conventional interventions that are often implemented in the classroom (Green, 2007). Instead, they often require individualized program planning and ongoing teacher support.

In addition to learning difficulties, children with FASD can also exhibit a number of behavioural challenges in the classroom. Hyperactive and impulsive behaviours can lead to disruptions in the classroom, while difficulties understanding abstract concepts and receptive language delays can cause frustration due to misunderstanding of rules and directions (Mukherjee, Hollins, & Turk, 2006). Deficits in executive functioning (EF) make understanding cause and effect relationships and learning from consequences difficult for these

children (Rasmussen, 2005). They may therefore engage in the same disruptive behaviours repeatedly, appearing as though they are purposefully defying rules and choosing not to listen to a teacher's requests, when in reality this is not the case. Individuals with FASD also experience difficulties with their socio-emotional development (Jacobson et al., 1993), as they often lack social maturity and have difficulties understanding non-verbal language cues and perspective-taking (Benton Gibbard, Wass, & Clarke, 2003; Kodituwakku, 2006). These difficulties interfere with their ability to build social relationships with same-aged peers, which can cause them significant frustration and emotional distress in the classroom.

Due to their academic, behavioural, and social concerns, children with FASD require ongoing support from teachers to ensure that they get the most out of their classroom experience. Given the number of children affected by this disorder, and the move towards inclusive education in Alberta (Alberta Education, 2010), it is very likely that regular education teachers will come into contact with and be actively involved in supporting children with FASD in their classrooms on a daily basis. Considering the increased needs of the FASD population, and the specific challenges these children experience in school, it is important that teachers feel prepared and confident in their ability to work with and support these students. However, teachers have reported that they have either not received specific training for working with children with FASD, or that the training they did receive was ineffective, leading them to feel underprepared to work with and support these students (Dybdahl & Ryan, 2009).

In preparing our teachers to work with special populations, such as those with FASD, one important factor to consider is their sense of efficacy. An efficacious teacher is one who feels that he or she is capable of bringing about positive change in his or her students (Gibson & Dembo, 1984), and teacher-self efficacy has been found to relate to many teacher behaviours, attitudes, and classroom characteristics that may be beneficial in working with students with FASD (e.g. Ashton & Webb, 1986; Gibson & Dembo, 1984). Among the many factors that are hypothesized to contribute to a teacher's sense of self-efficacy, a recent study suggests that teachers' self-efficacy may be related to the way in which they attribute the underlying causes of student difficulties (Andreou & Rapti, 2010). In addition, previous self-efficacy research has shown that the way in which an individual attributes the causes of events relates to their own self-efficacy beliefs (Coffee, Rees, & Haslam, 2009; Gernigon & Delloye, 2003). For example, one study found that undergraduate students who attributed academic failure to a lack of effort had higher self-efficacy than those who attributed failure to a lack of ability (Hsieh & Schallert, 2008). However, research examining teachers' attributions of student difficulties and how they relate to self-efficacy is scarce, and how these two constructs are related in the context of working specifically with children with FASD has yet to be examined.

The present study was an attempt to expand the current understanding of factors that contribute to teacher self-efficacy in working with special populations, in this case students with FASD. This study employed a survey method to examine pre-service teachers' understanding about the causes of

problems associated with FASD, the attributions they hold about those causes, and how those attributions predict their sense of self-efficacy.

Literature Review

Self-Efficacy

As a general construct, self-efficacy has been defined by Bandura as the "belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977, p. 3). In other words, self-efficacy involves a person's beliefs about their ability to perform the skills necessary to complete a specific task. Self-efficacy beliefs can influence an individual's thoughts, emotions, and behaviours (Bandura,1993 & Bandura, 1997). They play a role in determining the goals that people set for themselves, how much effort they put into tasks, how long they persist in difficult situations, and how resilient they are when confronted with failure (Bandura, 1993). Self-efficacy also influences behaviour in that people tend to seek out and apply themselves in situations and tasks in which they feel efficacious, while they tend to avoid situations which they perceive as exceeding their ability (Bandura, 1977).

Individuals with high self-efficacy are not necessarily highly competent. Essentially, self-efficacy involves a perception of competence rather than the actual level of competence a person has in a given area. This is an important distinction because individuals can both over and underestimate their abilities in specific areas, and these estimations have an effect on their actions and behaviours (Bandura, 1997). For example, one study found that children with the same level of math ability performed significantly differently when solving math problems depending of their self-efficacy beliefs. Students with higher self-

efficacy persisted longer and more consistently applied appropriate strategies than their same-ability peers with lower self-efficacy (Bouffard-Bouchard, Parent, & Larivee, 1991). So while someone may possess a certain set of skills or competencies, the way in which they perceive those skills will influence if and how they choose to apply them.

Self-efficacy is also context-specific, in that an individual can feel very capable and efficacious in one situation or with one task, and not in another (Gist & Mitchell, 1992). For example, someone may feel efficacious in their ability to solve a math problem but not a physics problem, or to ride a bicycle but not a motorcycle. In this way, self-efficacy is different than self-esteem or self-confidence, which are typically seen as more broad traits that carry across multiple situations and contexts (Gist & Mitchell, 1992). The specificity of self-efficacy, how it relates to competence, and its ability to affect motivation, thoughts, and behaviours are all important in conceptualizing teacher self-efficacy and its importance in the classroom.

Teacher Self-Efficacy. Specific definitions of teacher self-efficacy have varied and evolved throughout the years, largely depending on the researchers' theoretical background and the tools being used to measure the construct. Gibson and Dembo (1984) provided perhaps the simplest explanation when they defined teacher self-efficacy as the extent to which a teacher believes he or she has the skills and abilities necessary to bring about positive change in a student. Teacher self-efficacy involves teachers' beliefs about their ability to influence student

learning, even with those students who are difficult to teach (Guskey & Passaro, 1994).

Teacher efficacy can be divided into two different constructs: personal teaching efficacy (PTE) and general teaching efficacy (GTE). While PTE involves teachers' beliefs about their own personal abilities as an educator, GTE is a belief about what teachers in general can accomplish, without taking into consideration the individual teacher's beliefs about his or her own abilities (Gibson & Dembo, 1984; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). For example, a teacher may feel as though teachers in general have the ability to bring about positive change in students and encourage student learning, but may not feel efficacious in his or her own ability to do so. While both PTE and GTE have been examined in the literature, PTE is most similar to the construct of teacher self-efficacy, and has more often been found to correlate with important teacher characteristics and student outcomes.

Like general self-efficacy, teacher self-efficacy has been found to be situation-specific (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Teachers' sense of efficacy might differ between teaching academic content and managing classroom behaviour. Alternatively, teacher self-efficacy may vary depending on the group of students they are working with (i.e. students with learning difficulties vs. students with behavioural challenges). The specificity of teacher self-efficacy is important in the context of this research. Because of the increased needs of students with FASD and teachers' lack of training and preparation to work specifically with this group (Dybdahl & Ryan, 2009), teachers may experience

different levels of self-efficacy in working with these students than in working with students in general. More specifically, teachers' self-efficacy may differ across different areas of working with students with FASD (e.g. academically, behaviourally, or socially). Even more specifically, teachers' sense of efficacy in working academically with students with FASD may vary across different subjects (e.g. language arts, science, or mathematics). Given how context-specific self-efficacy can be, the specificity of tools used to measure this construct has long been debated in the literature. While more general measures may not accurately capture a teachers' differential sense of efficacy across various situations, a measure that is too specific provides little predictive validity outside of the situation in which it was created (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Historically, several measures of teacher self-efficacy have been developed, each varying in their level of situation specificity.

History and Development of Teacher Self-Efficacy. The construct of "teacher efficacy" was examined in 1976 by the Rand Corporation, and was conceptualized as the extent to which a teacher believed that students' motivation and learning were in the hands of the teacher (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). The measure employed by the Rand researchers was based on Rotter's Locus of Control theory (1966), and examined to what extent the teacher believed that students' outcomes were due to factors under their control (i.e. internal) more so than factors not under their control (i.e. external). These two questions assessed teacher efficacy broadly, and lacked specificity.

Based on his own theory of Self-Efficacy, Bandura later created the Teacher Self-Efficacy Scale (Bandura, 1997). Since self-efficacy is not necessarily similar across different situations and contexts, Bandura's measure included 30 items which loaded onto seven self-efficacy subscales. With this measure, Bandura attempted to provide a multi-faceted approach to teacher self-efficacy across various situations, without becoming too specific (Bandura, 1997). However, reliability and validity information for this scale is not readily available (Tschannen-Moran & Woolfolk Hoy, 2001).

Gibson and Dembo (1984) created a measure of teacher self-efficacy based off of the original two Rand items, while considering some of the concepts inherent in Bandura's self-efficacy theory. Their scale measures two factors: Personal Teaching Efficacy and General Teaching Efficacy, which are correlated with the original questions from the Rand studies. Although a number of inconsistencies have been recorded in the use of this measure, and its validity has been questioned (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), it remains one of the most widely used measures of teacher self-efficacy in the research.

In light of the inconsistencies of the Gibson and Dembo (1984) measure, Tschannen-Moran and Woolfolk Hoy (2001) developed a new measure of teacher self-efficacy: the Teacher Sense of Efficacy Scale (TSES). The authors carefully considered strengths and weaknesses of previous measures in the development of the TSES, which measures teacher self-efficacy in the domains of instructional strategies, classroom management, and student engagement, and is thought to present an optimal balance of specificity and generality. The TSES measures

teacher self-efficacy as "the teacher's belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1988, p. 22).

Correlates of Teacher Self-Efficacy. Since the Rand Corporation first examined how teacher efficacy related to student reading ability in 1976 (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), researchers have focused on how teachers' self-efficacy beliefs relate to a number of factors including both student variables (e.g. academic achievement, motivation, and self-efficacy), and teacher variables (e.g. motivation, attitudes, and behaviour).

Student Outcomes. Teacher self-efficacy has been found to be positively related to student achievement outcomes (Gibson & Dembo, 1984; Ross, 1992). The Rand Corporation originally found that teachers' efficacy beliefs were related to reading achievement in minority students, with teachers who reported higher self-efficacy having students with higher reading scores (Armor et al., 1976). More recently, Caprara and colleagues found that teachers' sense of efficacy was positively related to their students' academic achievement (Caprara, Barbaranelli, Steca, & Malone, 2006). Although causation is often difficult to establish in self-efficacy research (i.e. do teachers with higher efficacy promote academic achievement in their students, or do teachers who have higher achieving students feel more efficacious?), one longitudinal study found that students' computer literacy skills increased when they moved from a lower efficacy to a higher efficacy teacher (Ross, Hogaboa-Gray, & Hannay, 2001).

Teacher Outcomes. Teacher self-efficacy has also been shown to relate to teachers' behaviour in the classroom. For example, studies have shown that teachers with higher self-efficacy were more likely to persist longer when working with a student who was struggling (Gibson & Dembo, 1984), and were less likely to refer challenging students for placement in special education classrooms (Meijer & Foster, 1988). Teachers with higher self-efficacy have also been shown to be more open to new ideas and willing to try new methods of teaching in order to meet the needs of their students (Guskey, 1988; Stein & Wang, 1988), and were less likely to be critical of students when they made mistakes (Ashton & Webb, 1986). Contrarily, teachers with lower self-efficacy have been found to experience more job-related stress and difficulties in teaching (Betoret, 2006). Another study found that teachers with high self-efficacy tended to direct their energy at resolving problems, while those with lower self-efficacy tended to avoid dealing with academic problems (Chwalisz, Altmaier, & Russell, 1992).

Academically, Gibson and Dembo (1984) found that teachers with a high sense of efficacy devoted more class time to academic instruction in the classroom, provided more help to students who had learning difficulties, and were more likely to praise these students for their accomplishments. In contrast, teachers with lower self-efficacy were more likely to spend classroom time in non-academic tasks, to more easily give up on students who did not pick up on things quickly, and to criticize students who were unsuccessful. High efficacy

teachers were also more likely to divide the class for small group instruction as opposed to instructing the class as a whole.

Many of the outcomes associated with teacher self-efficacy mentioned above have direct implications for working with special needs students, and those with FASD in particular. Teachers with higher self-efficacy beliefs are more likely to take time to work with students who are experiencing difficulties, and less likely to believe those students require special education supports. Furthermore, a teacher who is open and willing to try new instructional strategies and techniques may be successful in finding a method for effectively teaching their student with FASD, and a teacher who is more likely to organize and plan may be more likely to develop a consistent classroom environment, which is important for these children (Green, 2007). Given the increased needs of the FASD population, and the importance of having them supported by efficacious teachers in the classroom, it is essential that we understand the factors that are related to the development of teacher self-efficacy.

Factors Influencing Teacher Self-Efficacy. A number of factors have been hypothesized to contribute to the development of self-efficacy in general. Bandura (1977) proposed four sources of self-efficacy beliefs: mastery experiences, physiological arousal, vicarious experiences, and social persuasion. While Bandura largely focuses on these four sources, he has also acknowledged that causal attributions play a role in the development of self-efficacy (Bandura, 1993). For example, if the cause of success is perceived as internal to the person and relatively stable, then self-efficacy is enhanced. Conversely, if success is

attributed to causes outside of an individual's control, then self-efficacy may not be affected (Bandura, 1993; Pintrich & Schunk, 1996). Studies have since confirmed that the way in which an individual attributes the causes of an event is related to their sense of efficacy.

Although the relationship between causal attributions and teacher self-efficacy in the classroom has rarely been examined, one recent study found that the way in which a teacher attributed the cause of a students' behaviour problem related to their sense of self-efficacy. (Andreou & Rapti, 2010). Specifically, teachers who were more likely to report that students' behaviour problems were caused by school-based factors reported higher levels of teacher self-efficacy in the area of classroom management. This promising research suggests that the relationship between teachers' attributions about student difficulties and their teacher self-efficacy in specific domains (e.g. classroom management, student engagement, instructional strategies) warrants further examination.

Attribution Theory: Causal Attributions and Outcomes

Causal attributions are defined as the perceived causes of outcomes (Weiner, 1985). There are a number of different attribution theories, all centering around the premise that individuals tend to search for the causes of significant events in their lives (Schunk, 1991). Although there are a number of attribution theories and dimensions of causality that can be considered, the current study will focus on a theory developed by Weiner (1985). Weiner posits that attributions about the causes of events are made along three causal dimensions: Locus of Causality, Stability, and Controllability.

The first causal dimension, Locus of Causality, refers to the extent to which an individual believes that the cause of an event or outcome is within themselves (e.g. internal) versus external to themselves. The Stability dimension involves the extent to which an individual attributes the causes of an event to be stable versus open to change. Finally, the Controllability dimension involves the extent to which an individual perceives the causes of an event to be under the control of someone, either themselves or another person.

The controllability dimension has posed some difficulties conceptually, as causes are attributed as being either "under the control of the self or others" or "not under the control of the self or others" (McAuley, Duncan, & Russell, 1992). However, many events that may be considered personally controllable are not perceived as externally controllable and vice versa, making it difficult for individuals to accurately identify their attributions in a research context (McAuley, Duncan, & Russell, 1992). For example, it may be difficult to decide the extent to which failing a test is "under the control of self or others" if an individual believes that the test result was due to the instructor being unfair (i.e. under the control of another person), but not controllable by themselves. Therefore, McAuley, Duncan, and Russell (1992), when revising their measure of causal dimensions, split Controllability into two dimensions: Personal Control (i.e. the extent to which the causes of an event are controllable by the individual) and External Control (i.e. the extent to which the causes of an event are controllable by another person). As a result, attributions for the causes of events are commonly measured along four dimensions.

Weiner (1985) posits that the way in which an individual attributes the causes of an event affects their emotions related to that event, their reaction to it, and their subsequent behaviour. For example, he explained that internal attributions for success usually result in feelings of pride, while internal and controllable attributions for failure, such as lack of effort, are likely to result in guilt (Weiner, 2010). Stable attributions for negative events are likely to result in hopelessness, while causes attributed as unstable are more likely to elicit hope, as they create future expectations for failure or success respectively. These emotions then influence the decisions a person makes. For example, an individual who attributes failure at school to be internal, stable, and uncontrollable may expect to fail in the future, feel hopeless about their education, and drop out of school as a result (Weiner, 2010).

Weiner further explains that it is not the actual cause of an event, but how that cause is attributed that determines an individual's response to it (Weiner, 1985). For example, imagine that the student mentioned above failed a test because he or she did not study the material. If that student correctly attributed their failure to a lack of effort, which is internal, unstable, and controllable, Weiner explains that they will likely put more effort into studying next time in order to succeed. However, if they misattribute their failure to a lack of ability, which is typically seen as internal, stable, and uncontrollable, they are more likely to feel hopeless and less likely to change their studying strategy (Weiner, 1985). This difference between the actual cause of an event and the attributions about that cause is important when studying FASD because there are a number of

factors that can contribute to the difficulties and challenges these children face. For example, primary disabilities associated with brain damage due to alcohol are often further complicated by the child's home environment, social relationships, and misunderstanding from the public (Streissguth & Kanter, 1997), all of which are external to the child but may vary in the extent to which they are seen as stable or controllable.

According to attribution theory, an individual's belief about what causes the problems associated with FASD would not determine their reaction to it. Rather, how the individual attributes those causes along the four causal dimensions will have an effect on the way in which they react (Weiner, 2010). Therefore, this study investigated both teachers' beliefs about the causes of problems (i.e., the actual reason for the behaviours associated with FASD) and the underlying causal dimensions along which they attribute those causes (i.e., how stable the cause was).

Teachers' Causal Attributions. Weiner's attribution theory has been applied to teachers' interactions with their students in various ways. For example, one study found that teachers who perceived a student's failure on a test to be due to controllable factors (e.g. lack of effort) were more likely to react punitively, while those who attributed the failure to something uncontrollable (e.g. lack of ability or aptitude) were more likely to responded with the goal of helping these students improve in the future (Reyna & Weiner, 2001). The relationship between an individual's willingness to offer help and their attributions about the controllability of a cause has been replicated across a wide range of settings,

including research on helping the less-fortunate and those who are ill (Weiner, 1995).

Another study found that the way in which a teacher attributed the difficulties experienced by a student was related to the interventions he or she suggested. For example, teachers who attributed a student's difficulties as being due to problems at home more often suggested interventions that emphasized parental involvement, while teachers who attributed a student's difficulties to school-based factors were more likely to suggest interventions related to teaching strategies (Soodak & Podell, 1994). When these results are paired with Bandura's (1977) assertion that attributions influence self-efficacy beliefs, it makes sense that a first step in understanding the way teachers interact with students with an FASD is to understand how their attributions for FASD relate to their efficacy.

To date, it appears as though only one published study has examined teacher self-efficacy in relation to causal attributions for behaviour disorders (Andreou & Rapti, 2010). The authors found that teachers who attributed student difficulties as being due to school-based factors reported greater self-efficacy in the area of classroom management. Two limitations of this study, however, were that only the subcategory of efficacy for classroom management was examined and that they focused on actual causes instead of underlying causal dimensions. Remedying these issues, Fontaine (2012) tested the causal dimensions underlying teachers' attributions as predictors of expectancies for change and overall efficacy when working with students with behaviour disorders. She found that of the four dimensions, only Stability was a significant predictor of efficacy. Like Andreou &

Rapti (2010), Fontaine's (2012) work focused on practicing rather than pre-service teachers and attributions for behaviour disorders in general. Therefore, the generalizability of these results to pre-service teachers and in relation to working specifically with students with FASD remains unknown.

In light of the limitations of previous research, the purpose of the present study was to examine pre-service teachers' beliefs about the causes of problems associated with FASD, how they attribute those causes along the four causal dimensions (i.e. locus of causality, stability, personal control, and external control), and how those attributions relate to their self-efficacy in the areas of classroom management, instructional strategies, and student engagement when working with students with FASD.

Research Questions and Hypotheses

The primary research question guiding this study was: To what extent do pre-service teachers' attributions about the causes of problems associated with FASD predict their self-efficacy? However, before pursuing this question I examined two preliminary research questions to provide some context to the attributional dimensions. These questions were (1) What do pre-service teachers believe is the primary cause of problems associated with FASD? and (2) Are those causes systematically related to causal dimensions? This preliminary section was exploratory in nature, and specific hypotheses about the causes and underlying dimensions were not made.

For the main research question it was hypothesized that:

1. Stability would negative predict teacher self-efficacy. I expected that as a cause was attributed as being more stable (i.e. unchangeable), teacher self-efficacy would decrease, given that teacher self-efficacy is defined as the degree to which teachers feel they are capable of bringing about positive change in their students (Gibson & Dembo, 1984). In this study, this means I expected to find a positive relationship between the variable measuring stability and the variable measuring efficacy because high scores on the stability dimension indicate unstable attributions.
2. Personal and External Control would positively predict teacher self-efficacy. I expected pre-service teachers who attributed the causes as being under the control of the child or under the control of others would report feeling more efficacious. In this study, this means I expected to find a negative relationship between the variables measuring control and the variable measuring efficacy because low scores on the Personal and External Control dimensions indicate controllable attributions.
3. The Locus of Causality dimension would not significantly predict teacher self-efficacy.

Method

Research Design and Variables

Data for this study were gathered via a cross sectional survey method. A survey method was chosen for this research because surveys can provide a quantitative description of attitudes, beliefs, and opinions of a sample that can be generalized to the larger population (Creswell, 2009).

The criterion variable for this study was teacher self-efficacy, both in general and in relation to three specific areas: classroom management, instructional strategies, and student engagement. The predictor variables of interest were the four causal dimensions along which a pre-service teacher attributes the causes of the problems associated with FASD. These four dimensions were: locus of causality (internal or external), stability (stable or unstable), personal control (controllable or uncontrollable by self), and external control (controllable or uncontrollable by others). Because attributions are made in reference to perceived causes, I first asked participants to disclose what they believed to be the primary cause of the problems associated with FASD. This allowed me to determine if the perceived causes were systematically related to the underlying causal dimensions. The following demographic variables were also taken into consideration during analyses: teacher gender, teacher age, previous teaching experience (i.e. whether or not students had completed their first teaching practicum), and future expectations of being involved in the implementation of interventions for students with FASD in the classroom.

Participants and Procedures

Participants for this study were students registered in the Bachelor of Education program at a Western Canadian University, and completed the survey through participation in the Educational Psychology Participant Pool. In exchange for participating students received one credit toward their overall course grade in an undergraduate educational psychology course. The survey took approximately one hour to complete and was administered online via surveymonkey.com©, a

secure internet-based website for creating questionnaires and collecting data online. Students interested in receiving credit toward their course grade were invited to contact the researcher via e-mail in order to receive a link to the online survey. To ensure participants' anonymity, student numbers were collected independently of the survey results and were used for the sole purpose of awarding class credit. Students sent their identification numbers in an email to the researcher. A list of participating students' numbers was then forwarded to the participant pool research assistant, who awarded credit for participation.

The survey began with a statement of informed consent (see Appendix A), which outlined the rights of the participant. Students could then select "I consent to participate" to continue onto the survey, or "I do not want to participate", to exit the survey without penalty. In total, 203 online surveys were completed.

The data were downloaded from Surveymonkey.com© into an excel file. From the data file of 203 participants, data from participants who did not complete the items of interest for this analysis (i.e. TSES and CDSII) were deleted. This resulted in the deletion of 33 participants. Data were then screened for multiple responses from the same individual. Survey responses with the same IP address and who provided identical responses to the demographic questions were assumed to be duplicates and were deleted, resulting in the deletion of another 13 participants. The final number of participants used for the analysis was 157. All data were entered electronically by the SurveyMonkey.com© software, eliminating the need to screen items for manual entry errors. The excel file was

then transferred into Statistical Program for the Social Sciences Version 19 (SPSS-19) for analysis.

Measures

Demographic Measures. All demographic variables were gathered via self-report on the online survey. Participants indicated their gender (21% males, 78% females, 1% undisclosed) and their age (M = 22, range = 18 to 51). As a measure of their previous teaching experience, participants indicated whether they had completed their Introductory Professional Term (IPT) and their Advanced Professional Term (APT). Approximately 27% of participants had completed their IPT and none had completed their APT at the time of the survey. Finally, participants were asked to answer the question "to what extent do you think you will be involved in interventions for students affected by FASD?" on a 4-point scale, with responses ranging from "very little" to "very much". In terms of their expectations, 6% expected to have "very little" involvement, 12% expected to be involved "a bit", 36% expected to be "somewhat" involved, and 44% expected to be "very much" involved in the implementation of interventions for children with FASD. Each participant's response was used as a measure of their expectations to work with children affected by FASD in the future.

Teacher Self-Efficacy. A modified version of the short form of the Teacher Sense of Efficacy Scale (TSES), developed by Tschannen-Moran and Woolfolk Hoy (2001), was used to measure teacher self-efficacy, the criterion variable for this study. The TSES (Short Form) uses 12 questions to measure teachers' self-efficacy in teaching situations, with responses ranging from 1

(nothing) to 9 (a great deal). For the purposes of this study, 11 of the 12 questions were modified to focus specifically on teachers' sense of self-efficacy in working with children affected by FASD in their classrooms. Changes to the survey were minimal and in most cases involved adding or substituting the words "these students" (i.e., students with FASD) into the question. For example, Question 1, which read "How much can you do to control disruptive behavior in the classroom?" was changed to "How much can you do to control the disruptive behaviour of these students in the classroom?" A complete list of the modified TSES items is available in Appendix B.

The TSES was developed to measure teacher self-efficacy with both in-service and pre-service teachers. Within this scale, three factors have been identified for in-service teachers, including efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement. Reliabilities for the 3 subscales range from .81 for Instructional Strategies to .86 for both Student Engagement and Classroom Management (Tschannen-Moran & Woolfolk-Hoy, 2001). However, the developers of the TSES found that these three factors were not as distinct for pre-service teachers, and suggest instead that only a total Self-Efficacy score, created by summing responses to all 12 items, be used with this population. They found that the alpha reliability for the full 12-item scale was .90, with item loadings ranging from .49 to .75 (Tschannen-Moran & Woolfolk Hoy, 2001). These results suggest that the total score is an effective way to assess teacher self-efficacy for both pre-service and in-service teachers. Therefore, this study focused largely on teacher self-efficacy as one general factor

calculated using the sum total of all 12 items on the TSES form, however, the three subscales measured by the TSES will also be examined briefly.

Construct validity for the TSES has been examined by comparing it to a number of other established measures of teacher self-efficacy and general teaching efficacy. The total score for the TSES short form has been shown to positively correlate to both items on a scale developed by the Rand Corporation ($r = .18$ and $.52$, $p < .001$; Armor et al., 1976), as well as both the Personal Teacher Efficacy (PTE) factor and the General Teacher Efficacy (GTE) factor from Hoy and Woolfolk's (1993) adaptation of the Gibson and Dembo Teacher Efficacy Scale ($r = .61$ and $.16$, $p < .001$). The weaker correlation ($r = .16$) with the GTE provides evidence for the discriminant validity of the TSES, by confirming that it more closely aligns with measures of teacher self-efficacy as opposed to the more general teacher efficacy described by Gibson and Dembo (1984).

Causes of FASD. Participants were asked to respond to the open ended question "What do you believe is the primary cause of the problems associated with FASD?" as a measure of their beliefs about why these children experience difficulties. Responses to this question were reviewed by the researcher and coded into four categories: Biological, Environmental, Lack of Education, and Complex. Participants were referred back to their response to this question when responding to questions about their causal attributions, the measure of which is presented next.

Causal Attributions. A modified version of the Revised Causal Dimension Scale (CDS-II; McAuley, Duncan, & Russell, 1992) was used to

assess teachers' attributions for the causes of problems associated with FASD, along four causal dimensions. These dimensions include Locus of Causality (internal/external), Stability (changeable/unchangeable over time), Personal Control (controllable by the child) and External Control (controllable by others). These four dimensions represent the four predictor variables of interest for this study.

The CDS-II is a 12-item questionnaire, with three questions pertaining to each of the four causal dimensions. Items are presented along a 9-point semantic differential scale, with opposite constructs appearing on each end (e.g., 1 = controllable vs. 9 = uncontrollable). The original CDS-II asks respondents to answer the 12 questions based on the perceived causes of their own performance at a specific task, and so questions were modified to focus on their perception of the causes of the problems associated with FASD instead. This was achieved by rephrasing the questions to include the words "The primary cause of the problems associated with FASD" to remind participants of the outcome for which they were making attributions. Secondly, the wording in the "controllable by self" questions was changed to reflect FASD being controllable by the child instead of by the participant. For example, Question 2, which originally read "Is the cause something manageable by you/not manageable by you" was changed to "The primary cause of the problems associated with FASD is manageable by the child/ not manageable by the child". The complete modified version of the CDS-II is attached in Appendix C.

The CDS-II has been factor analyzed and tested by the developers in four studies (McAuley, Duncan, & Russell, 1992). The internal consistency of the four subscales across those studies ranged from a Cronbach's alpha value of .60 for the Locus of Causality dimension to .92 for the External Control dimension. Average reliabilities across studies for the subscales were .67 for both Locus of Causality and Stability, .79 for Personal Control, and .82 for External Control (McAuley, Duncan, & Russell, 1992).

The developers of the CDS-II have found that many of the subscales are inter-correlated. For example, they found a negative correlation ($r = -.56$, $p < .05$) between perceiving something as personally controllable versus externally controllable. Secondly, both control subscales are correlated with the stability subscale, but in opposite directions. Personal control was associated with considering a cause to be unstable ($r = .33$, $p < .05$), while external control was associated with believing the cause was stable ($r = .16$, $p < .05$). In addition, McAuley, Duncan, and Russell found that both control subscales were also correlated with the locus of causality subscale. Perceiving a cause as controllable by the self was positively associated with the internal locus of causality ($r = .71$, $p < .05$), while perceiving a cause as externally controlled was positively associated with an external locus of causality ($r = .65$, $p < .05$). Only the locus of causality and stability subscales were found to be uncorrelated. Despite the significant correlations that exist between subscales, the developers have concluded that the four subscales represent distinct constructs, and the CDS-II can be considered a

valid and effective measure of causal attributions (McAuley, Duncan, & Russell, 1992).

Rationale for Analyses

As preliminary analyses alpha reliabilities, descriptive statistics, and correlations were calculated for all four of the causal dimension subscales, the total teacher self-efficacy scale, and the three teacher self-efficacy subscales. Although the alpha values were in the acceptable range for all scales, an exploratory factor analysis (EFA) was conducted on items from the TSES and CDSII to ensure that all items loaded onto the factors they were intended to since the wording for both measures was modified. Participants' responses to the question "What is the primary cause of problems associated with FASD?" were coded into four categories and a one-way ANOVA was used to examine how the four categories of causes related to the four underlying causal dimensions.

The main research question was examined through regression analyses to determine the extent to which each of the four predictor variables (locus of causality, stability, personal control, and external control) related to teacher self-efficacy. Four separate regression analyses were performed; one for each subscale of teacher self-efficacy (i.e. instructional strategies, classroom management, and student engagement) and one for total teacher self-efficacy, which was expected to be the most appropriate criterion variable. For each regression, demographic variables (i.e. teacher gender, previous experience, and teacher expectations) were included in step 1 of the analysis, while the main variables of interest (i.e. the four causal dimensions) were added in step 2.

Results

Preliminary Analyses

Descriptive and Correlational Analyses. Alpha reliabilities for all scales fell in the acceptable range, between .66 and .97. Reliabilities and relevant descriptive information for all scales are included in Table 1.

Table 1. Descriptive Statistics

Variables	No. Items	Anchors	M	SD	α
Demographics					
Gender	1	1 = female; 2 =male	1.17	.38	-
Experience	1	1 = yes; 2 = no	1.70	.46	-
Expectations	1	1 = very little; 4 = very much	3.22	.874	-
Causal Dimensions					
Locus of Causality	3	1 = internal; 9 = external	15.84	5.86	.66
Stability	3	1 = stable; 9 = unstable	15.20	5.84	.70
Personal Control	3	1 = controllable; 9 = uncontrollable	19.55	5.03	.82
External Control	3	1 = controllable; 9 = uncontrollable	13.31	6.06	.85
Teacher Self-Efficacy					
Total Efficacy	12	1 = nothing; 9 = a great deal	80.22	14.16	.97
Classroom Management	4	1 = nothing; 9 = a great deal	25.30	5.00	.90
Instructional Strategies	4	1 = nothing; 9 = a great deal	28.09	5.26	.93
Student Engagement	4	1 = nothing; 9 = a great deal	26.91	4.99	.91

Correlations between all variables of interest for the main analyses are presented in Table 2. Age was not correlated with any of the subscales from the TSES or the CDSII, and so was not included as a demographic variable in further analyses. Expectations of being involved in interventions for children with FASD were positively correlated with all of the self-efficacy scales. The Stability dimension was also correlated with all self-efficacy subscales, in that teachers who felt the problems associated with FASD were more unstable reported higher self-efficacy. Finally, the External Control dimension was negatively correlated

with all other causal dimensions, in that the more a cause was seen as being under the control or others, the more likely it was to be viewed as external to the person, unstable, and not under personal control.

Table 2. Correlation Matrix for all Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	1.00											
2. Gender (1 = female 2 = male)	.05	1.00										
3. IPT (1= yes; 2 = no)	-.34**	-.06	1.00									
4. Expectations	.09	-.10	-.16	1.00								
5. Locus of Causality	.05	-.07	.01	-.01	1.00							
6. Stability	.003	-.13	.06	.08	.48**	1.00						
7. Personal Control	.10	.04	-.14	-.01	.20*	-.05	1.00					
8. External Control	-.01	-.04	.01	.09	-.46**	-.39**	-.20*	1.00				
9. Total Efficacy	-1.0	-.10	-.07	.21**	.10	.27**	-.08	-.18*	1.00			
10. Classroom Management	-.08	-.09	-.05	.18**	.08	.27**	-.10	-.24**	.92**	1.00		
11. Instructional Strategies	-.09	-.09	-.07	.21**	.03	.23**	-.06	-.11	.93**	.77**	1.00	
12. Student Engagement	-.10	-.12	-.05	.21**	.16	.26**	-.09	-.16	.94**	.81**	.81**	1.00

*$p < .05$, **$p < .001$

Factor Analysis. ***TSES.*** The EFA with a principal component extraction resulted in a one-factor solution, with items loading between .65 and .87. This suggests that the TSES is measuring one construct, teacher self-efficacy, and that the three subscales of self-efficacy (i.e. classroom management, student engagement, and instructional strategies) are not present in this population of pre-service teachers. The one-factor solution accounted for 63% of the variance.

CDS-II. The EFA with a principal component extraction and Oblimin rotation revealed a four-factor solution for the CDS-II. This four factor solution accounted for 69% of the variance. All items loaded sufficiently on the scales to which they were intended to belong. Item loadings for Factor 1, Locus of Causality, ranged from .53 to .84. For Factor 2, Personal Control, item loadings ranged from .74 to .85. Item loadings for Factor 3, External Control, ranged from .84 to .86, and item loading for Factor 4, Stability, ranged from .48 to .87. Only one item loaded higher on a dimension to which it was not intended to belong. The question "The primary cause of the problems associated with FASD is inside the child/ is not inside the child" loaded higher on the Stability factor than the Locus of Causality factor. However, its loading on the Locus of Causality factor was still in the acceptable range, at .53.

Dimensions Underlying the Causes of FASD. Participants' responses to the open-ended question "What do you believe is the primary cause of the problems associated with FASD?" were coded into four categories: Biological, Environmental, Lack of Education, and Complex. Biological causes were those that involved maternal alcohol consumption, or mention of brain damage or

cognitive impairment. Environmental causes involved aspects of the environment that are not meeting the child's needs, such as poor parenting or poverty. Causes that were labelled as being due to a Lack of Education involved a general lack of awareness from the public, including teachers, about the needs of individuals affected with FASD. The final category, Complex, was reserved for responses that included elements from more than one of the three previous categories. Examples from each category and the percentage of responses that fell under each one are presented in Table 3.

Table 3. Perceived Causes of the Problems Associated with FASD

Causes	Percentage	Examples
Biological	52%	"Mother drank alcohol when pregnant" "Cognitive Impairment due to alcohol"
Environmental	20%	"Poor parenting" "Low socio-economic status"
Lack of Education	11%	"Teachers not understanding how to work with them" "Lack of understanding of their needs by the public"
Complex	17%	"Physiological, but can be mediated through changes in the environment."

Results of the one-way ANOVA revealed significant differences between reported causes on the Stability ($F_{(3, 115)} = 13.0$, $p < .001$) and External Control ($F_{(3, 115)} = 4.2$, $p < .01$) dimensions. Post-Hoc analyses using Tukey's HSD revealed that for the Stability dimension, Biological causes ($M = 12.46$) were attributed as being more stable (i.e. lower scores on the scale indicate more stability) than those that were coded as either Environmental ($M = 18.21$) or due to a Lack of Education ($M = 20.38$). On the External Control dimension, causes that were

perceived as being due to a Lack of Education (M = 8.92) were attributed as being more controllable by others (i.e. lower scores on the scale indicate greater control by others) than those that were described as either Biological (M = 13.93) or Complex (M = 14.81) in nature.

Main Analyses

Total Self-Efficacy. Results for the Stepwise Multiple Regression analysis for total teacher self-efficacy are presented in Table 4. In Step 1, teacher self-efficacy was positively predicted by teacher's expectations of being involved in the implementation of FASD interventions (t = 2.52, p < .05). Gender and previous teaching experience were not significant predictors. The effects of expectation persisted in Step 2 (t = 2.66, p < .01), suggesting that independent of their causal attributions, participants who expected to be more involved in interventions with affected children reported higher teaching self-efficacy. In Step 2, two of the causal dimensions significantly predicted teacher self-efficacy: External Control and Stability. Specifically, the Stability dimension predicted self-efficacy in that participants who attributed the causes as being more unstable were more likely to report higher self-efficacy (t = 2.17, p < .05). In addition, the External Control dimension predicted teacher self-efficacy, as causes that were seen as more externally controllable were related to higher self-efficacy (t = -1.97, p < .05). The Locus of Causality and Personal Control dimensions did not significantly predict teacher self-efficacy.

Table 4. Regression Results for Total Teacher Self-Efficacy

	Total Self Efficacy	
Variables	Step 1	Step 2
Demographics		
Gender	-.12	-.10
Experience	-.04	-.07
Expectations	.22*	.23**
Causal Dimensions		
Locus of Causality	-	-.08
Stability	-	.21*
Personal Control	-	-.10
External Control	-	-.19*
Adjusted R^2	.05*	.13**

* $p < .05$, **$p < .01$

Self-Efficacy Subscales. Results for the Stepwise Multiple Regression analyses for the three subscales of teacher self-efficacy are presented in Table 5.

Efficacy for Classroom Management. Results for this subscale were similar to those of total teacher self-efficacy. In Step 1, teacher self-efficacy was positively predicted by teacher's expectations of being involved in the implementation of FASD interventions ($t = 2.02$, $p < .05$), and these effects of expectation persisted in Step 2 ($t = 2.36$, $p < .05$). In Step 2, External Control and Stability once again predicted teacher self-efficacy. Specifically, participants who attributed the causes of problems associated with FASD as being unstable or changeable were more likely to report higher self-efficacy ($t = 1.94$, $p < .05$). Causes that were attributed as more externally controllable were also related to higher self-efficacy ($t = -2.95$, $p < .05$). The Locus of Causality and Personal Control dimensions did not significantly predict efficacy for classroom management.

***Efficacy for Instructional Strategies*.** In Step 1, teacher self-efficacy for instruction was positively predicted by participants' expectations of being involved in the implementation of FASD interventions ($t = 2.62$, $p < .01$), and these effects persisted in Step 2 ($t = 2.46$, $p < .05$). In Step 2, only the Stability dimension predicted teacher self-efficacy. Participants who attributed the causes of problems associated with FASD as being unstable (i.e. changeable) were more likely to report higher self-efficacy ($t = 2.31$, $p < .05$). The Locus of Causality, Personal Control, and External Control dimensions did not significantly predict efficacy for instructional strategies.

Efficacy for Student Engagement. Teacher self-efficacy specific to student engagement was positively predicted by teacher's expectations of being involved in the implementation of FASD interventions in Step 1($t = 2.53$, $p < .05$). These effects of expectation persisted in Step 2, as teacher expectations were the sole significant predictor of self-efficacy ($t = 2.47$, $p < .05$). None of the causal dimensions significantly predicted pre-service teachers' sense of self-efficacy for student engagement.

Table 5. Regression Results for Teacher Self-Efficacy Subscales

Variables	Classroom Management		Instructional Strategies		Student Engagement	
	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Demographic						
Gender	-.09	-.07	-.10	-.08	-.16	-.14
Experience	-.02	-.04	-.06	-.07	-.03	-.05
Expectations	.17*	.20*	.22**	.21*	.21*	.21*
Causal Dimensions						
Locus of Causality	-	-.11	-	-.11	-	.03
Stability	-	.19*	-	.23*	-	.18
Personal Control	-	-.11	-	-.05	-	-.11
External Control	-	-.28**	-	-.11	-	-.11
Adjusted R^2	.02	.13**	.05*	.09*	.06**	.11*

*$p < .05$, **$p < .01$

Discussion

The purpose of this study was to examine pre-service teachers' understanding of the causes of problems associated with FASD, the attributions they make about those causes, and how those attributions related to their sense of teacher self-efficacy. In general, the results support my hypotheses that stability and controllability would be the most influential causal dimensions. In this section I will further discuss the results of the preliminary and main analyses, the limitations of the current study, as well as implications and future directions for research.

Causal Attributions about the Problems Associated with FASD

The causes identified by participants fell into four categories, some of which were found to be systematically related to the four dimensions of causal attributions. Specifically, a number of the causes were related to both the Stability and External Control dimensions. Participants attributed biological causes (i.e.

brain damage due to alcohol, cognitive impairment) as being more stable than causes that were due to a lack of education or environmental factors. This relationship makes sense because changing a child's cognitive capacity may not be possible but environmental conditions and public knowledge and awareness about FASD is something that can be changed. Similarly, participants attributed causes that were due to a lack of education as being more externally controlled than biological or complex causes. Once again, this relationship is intuitive. Individuals external to the child, or at least their behaviours, can be controlled to some extent, while biological causes are more or less beyond our control. That complex causes were attributed as less externally controllable highlights the complexity of the challenges faced by children with FASD, as it suggests that when pre-service teachers believe that a combination of factors contribute to the difficulties these children have, they perceive it as something that is simply beyond the control of themselves and others. Although this cause may be the most accurate representation of the problems associated with FASD, which are indeed quite complex, its underlying dimension is concerning because it suggests that pre-service teachers may not believe the problems can be remedied through controllable factors such as interventions.

Although the perceived causes were found to be systematically related to the causal attributions made by the group as a whole, theory still posits that how the individual attributes the cause, rather than the cause itself, will contribute most to their emotions, thoughts, and actions (Weiner, 1985). For example, if one

participant saw biological causes as being unstable, then their behaviour would be guided by that unstable attribution, rather than the cause itself.

Causal Attributions as Predictors of Teacher Self-Efficacy

Total Teacher Self-Efficacy. The results of the analysis for teacher-self efficacy as a general construct largely supported my hypotheses in that pre-service teachers who attributed the causes of problems associated with FASD to be more unstable and under the control of others were more likely to report higher self-efficacy. That causes attributed as being less stable (i.e. more open to change) were related to higher teacher self-efficacy is consistent with the findings of Fontaine (2012). Also, as Gibson and Dembo (1984) suggest, the very definition of teacher self-efficacy implies the ability to bring about positive change in a student. If a student's difficulties are seen as stable and therefore not likely to change, teachers will feel less efficacious in working with them.

In terms of External Control, pre-service teachers who attributed the causes of problems associated with FASD as being under the control of another person reported higher self-efficacy. This is in contrast to general self-efficacy research that has found that the Personal Control dimension, rather than External Control, is related to self-efficacy (Coffee, Rees, & Haslam, 2009; Gernigon & Delloye, 2003; Weiner, 2010). However, that research involved individuals attributing the causes of events or outcomes that are personal to themselves, whereas this study had pre-service teachers attribute the causes of difficulties experienced by someone else: a child with FASD. Although the ambiguity of wording for items on the External Control dimension makes it impossible to know

whether participants perceived the "other person" as being themselves, parents, or someone else in the child's life, the results suggest that they may have assumed the "other person" to be themselves, as teachers. In this way, the External Control dimension is similar to the Personal Control dimension in the aforementioned studies, since participants are attributing causes as being "controllable by the self". This explains why the External Control dimension was significantly related to self-efficacy; participants who believe the difficulties experienced by these children are under their control as the "other" are likely to feel more efficacious in working with them than those who do not.

As predicted, the Locus of Causality dimension was not significantly related to teacher self-efficacy, which suggests that whether or not a cause is attributed as being internal to the person or external to the person, it does not relate to teacher self-efficacy. Finally, the Personal Control dimension did not predict teacher self-efficacy, suggesting that whether or not the child has control over the difficulties they experience was not related to pre-service teachers' reported self-efficacy. Of all four causal dimensions, the Personal Control scale received the highest scores, indicating that pre-service teachers believe that the problems experienced by children with FASD are not under their control. This is consistent with the causes of problems identified by participants, such as brain damage due to maternal drinking, environments that do not meet the needs of these children, and a general lack of awareness by the public about FASD, all of which do not seem to place any responsibility on the children as being in control of their own difficulties. This suggests that, universally, pre-service teachers do

not see the child as being in control of the challenges that they face. However, they do differ in the extent to which they see those challenges as being stable or externally controllable, which lead these variables to have a greater impact on their self-efficacy beliefs than Personal Control.

Teacher Self-Efficacy Subscales. Although the single-factor teacher self-efficacy is the most appropriate DV for this sample, both theoretically and empirically, I examined how the four causal dimensions predicted the three subscales of teacher self-efficacy out of interest. Two interesting differences emerged between the total teacher self-efficacy factor and the individual subscales. First, for the Student Engagement subscale, none of the causal dimensions predicted teacher self-efficacy. This may be because, as pre-service teachers with little classroom experience, participants may have had difficulty conceptualizing the construct of student engagement (McAuley, Duncan, & Russell, 1992). While classroom management and instructional strategies are typically part of teacher education program (University of Alberta, 2012), the concept of student engagement may be something that requires more in-class experience to fully understand in all its complexity, especially in relation to engaging students with FASD. Secondly, the External Control dimension did not predict self-efficacy for Instructional Strategies. The reason for this lack of relationship is unknown, though it supports Bandura's theory that self-efficacy is situation-specific, as teachers can feel differently about their ability to work with students across different settings and in different contexts (i.e. classroom management vs. instructional strategies). These are interesting findings, and

although they must be interpreted with caution, they suggest that future research into the subscales of teacher self-efficacy in relation to working with students with FASD is warranted. Recommendations for carrying out further research on these subscales are presented in the Limitations section below.

Expectations as a Predictor of Teacher Self-Efficacy

Perhaps one of the most interesting findings that emerged from this study is the role that future expectations played in predicting teacher self-efficacy. In all four regression analyses, pre-service teachers' who expected to be more involved in the implementation of interventions for students with FASD reported higher self-efficacy. In reality, these pre-service teachers will be involved to some extent in working with children with FASD when they enter the school system, and so it is encouraging to see that those who understand their role as a teacher are feeling prepared and confident in their abilities to work with these students. However, on the other hand, those who do not expect to be involved reported lower self-efficacy, which is troubling.

Previous research has found that mastery experiences aid in the formation of self-efficacy in that they create expectations for future success (Bandura, 1977). Therefore, it may be that pre-service teachers who reported high expectations of being involved in working with students with FASD have had previous mastery experiences in this area. However, this is speculative and beyond the scope of the current research. In addition, attributions along the stability dimension have been shown to affect expectancies of the future, in that stable attributions for negative outcome create expectancies of future failure,

while unstable attributions for negative outcomes create hope for future success (Weiner, 1985; Weiner, 2010). Future research is therefore warranted on the nature of the relationship between attributions, expectations and teacher self-efficacy.

Limitations

These results must be considered within the limitations of the current study. First and foremost, the participants for this study represented a convenience sample of individuals in a teacher education program at only one Western Canadian university. Therefore, these results may not be generalizable to in-service teachers, or pre-service teachers in other training programs. In addition, recruiting pre-service teachers did not allow for an in-depth analysis of how causal attributions relate to the various subscales of teacher self-efficacy, as these constructs were not distinct for this sample. In light of these limitations, future studies should consider including a sample of in-service teachers to examine ways in which their self-efficacy may differ from pre-service teachers, and to further examine their self-efficacy in specific domains (e.g. classroom management). Future studies might also consider sampling teachers from different training programs and geographical locations.

Secondly, the modified wording for the External Control dimension of the CDSII, used to measure causal attributions, was somewhat ambiguous. The three items measuring External Control asked participants the extent to which they believed the causes of problems associated with FASD were “under the control of others”, but did not specific who those “others” were. As mentioned above,

results suggest that participants perceived "other" to mean themselves as a teacher, but it is not possible to know for certain. If, for example, they perceived others to mean the child's parents, their answers may have been different than if they perceived others to mean teachers like themselves. Therefore, future studies in this area should carefully consider the specificity of wording and perhaps consider including questions that refer both to the cause being "under the control of teachers" and "under the control of parents" to examine if they are differentially related to teacher self-efficacy in working with students with FASD.

Thirdly, the current study did not take into consideration the teaching level of the participants (i.e. whether they were studying to become elementary or secondary education teachers). A question pertaining to this variable was included in the survey, although the format (i.e. open-ended) did not allow for the variable to be included in the analysis. Most participants, when given the freedom to respond openly, indicated their program was "Education", without including their specialty. Previous research has found that junior high and high school teachers hold different views of students with FASD than do elementary school teachers, as they are less likely to be involved in the education of the student across different subjects and situations, and therefore hold a more narrow view of their abilities and challenges in the classroom (Dybdahl & Ryan, 2009). It will therefore be important that future research collect this information to examine any possible differences between elementary and secondary teachers in their beliefs about the causes of FASD, their attributions about those causes, and how their

attributions relate to their self-efficacy. A multiple-choice format would perhaps be a better method for collecting this data.

Finally, this study did not control for participants' previous experiences working with children with FASD. Once again, this question was asked, but in an open-ended format, and given the wide range of responses it was not possible to code this variable in a way that would allow it to be included in the analysis. Future research should consider including a multiple choice question for the amount of previous experience, as it would be interesting to know if being exposed to children with FASD is related to an individuals' beliefs about the causes of problems associated with the disorder, the attributions they hold about those causes, or their teaching self-efficacy.

Implications and Future Directions

Results from the current study have far-reaching implications for the education of pre-service teachers. It has contributed to the teacher self-efficacy literature by confirming that the way in which teachers attribute the causes of problems experienced by their students predicts their self-efficacy in working with those students. This study focused on the problems experienced by students with FASD. Although these children are unique in the complexity of the challenges they face, there are a number of other populations of students who also experience challenges in the classroom and for whom the involvement of an efficacious teacher is important. Future research should continue to examine the relationship between causal attributions and teachers' self-efficacy in relation to difficulties experienced by other populations of students, such as those with

autism spectrum disorders, learning disabilities, attention-deficit/hyperactivity disorder (ADHD), conduct disorder, or chronic medical conditions.

Furthermore, future research should build on the results of this current study by examining ways to foster more adaptive causal attributions in pre-service teachers. For example, if teachers are misinformed about how stable or controllable the difficulties associated with a particular disorder are, and their attributions are related to their self-efficacy, their ability to work with students in the classroom may be affected. By correcting any misattributions and encouraging attributions that are related to higher self-efficacy (i.e. unstable and externally controlled), it may be possible to foster and encourage teachers' sense of self-efficacy in the classroom.

One way in which self-efficacy could be fostered is through the development of attributional retraining (AR) interventions for both pre-service and in-service teachers. Attributional retraining is designed to modify individuals' attributions for the causes of events or outcomes, in this case problems associated with FASD, by replacing maladaptive attributions with more adaptive ones (Haynes, Perry, Stupnisky, & Daniels, 2009). To date, AR interventions have been successful in modifying attributions and increasing success in areas such as athletic performance and academic achievement among college students (Haynes, Perry, Stupnisky, & Daniels, 2009; Miserandino, 1998). For example, a common AR intervention involves re-attributing an academic failure from ability to effort (stable to unstable) so that related constructs, such as motivation, are not undermined by the failure.

Research on AR in this context would make a novel contribution to the literature, as previous AR studies have focused on helping individuals to reattribute causes of events or situations that are personal to the individual (i.e. failing a test or winning an athletic event). In this case, teachers (both pre-service and in-service) would be taught to reattribute the causes of difficulties that are being experienced by another person: the student with FASD. The intervention itself would involve presenting teachers with factual information about FASD, while specifically highlighting the unstable and externally controllable nature of some of the challenges associated with the disorder. In practical terms, if successful, similar AR interventions have the potential to help teachers reattribute the causes of problems and difficulties experienced by a number of populations of students who are often misunderstood, such as those with autism, learning disabilities, or ADHD. This of course is beyond the scope of the current study but suggests a promising application of the results of the current research.

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Appendix A

Statement of Informed Consent

Thank you for taking the time to complete this survey as part of the Educational Psychology Participant Pool.

Please read over your rights as a participant and then choose whether or not you wish to proceed to the survey:

Rights: The participant pool does not conflict with your rights as a participant, including:

1. To not participate or to withdraw at any time without prejudice to pre-existing entitlements.
2. To opt out without penalty and to have any collected data not included in the study.
3. To privacy, anonymity and confidentiality: Do not put any identifiers on the survey.
4. To safeguards for security of data: Data will be stored on password-protected computers and destroyed in a way that ensures privacy and confidentiality after eight years.
5. To know of any conflict(s) of interest on the part of the researcher, of which there are none.
6. To contact the Chair of the EEA REB at (780) 492-3751 for questions regarding participant rights and ethical conduct of research.

- ☐ I consent to participate
- ☐ I do not want to participate

Appendix B

TSES - Modified

Participants were asked to answer the following questions on a scale from 1-9.

1	2	3	4	5	6	7	8	9
Nothing		Very little		Some influence		Quite a lot		A great deal

1. How much can you do to control the disruptive behaviour of these students in the classroom?

2. How much can you do to motivate these students in their schoolwork?

3. How much can you do to get these students to believe they can do well in their schoolwork?

4. How much can you do to help these students value learning?

5. To what extent can you raft good questions for these students?

6. How much can you do to get these students to follow classroom rules?

7. How much can you assist families in helping these children do well in school?

8. How well can you establish a classroom management system with these students?

9. How much can you use a variety of assessment strategies with these students?

10. To what extent can you provide an alternative explanation or example when these students are confused?

11. How much can you calm these students when they are being disruptive or noisy?

12. How well can you implement alternative strategies in your classroom?

Appendix C

CDS-II (modified)

Participants were asked to respond to the following questions on a scale from 1-9.

1. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Reflects an aspect of the child								Reflects an aspect of the situation

2. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is manageable by the child								Is not manageable by the child

3. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is permanent								Is not permanent

4. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Can be regulated by the child								Cannot be regulated by the child

5. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Can be controlled by others								Can be controlled by others

6. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is inside of the child								Is not inside of the child

7. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is stable								Is not stable

over time								over time

8. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is under the power of other people								Is not under the power of other people

9. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is directly related to something about the child								Is not directly related to something about the child

10. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is something the child has power over								Is not something the child has power over

11. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Is unchangeable								Is changeable

12. The primary cause of the problems associated with FASD:

9	8	7	6	5	4	3	2	1
Can be regulated by over people								Cannot be regulated by other people