

## Fetal Alcohol Syndrome: Perspectives of a Group of Educators in Northwest Florida

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### Abstract

Educators in two school districts were surveyed on their knowledge, attitudes, and perceived competence in educating students with fetal alcohol syndrome (FAS). Data from 114 surveys were analyzed using quantitative and qualitative methods. Spearman rank order correlation coefficients revealed statistically significant positive correlations between attitude and knowledge, perceived competence and knowledge, and perceived competence and attitude. Friedman's ANOVA indicated differences between teaching experience and attitude, a relationship between knowledge and type of teacher training, and differences in perceived competence by teacher location and grade level of teaching. Qualitative results revealed themes of knowledge and empathy in response to questions regarding support and strengths in educating students with FAS. Recommendations for educators in northwest Florida were discussed as well as implications of the research for education.

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### Introduction

The adverse effects of maternal alcohol consumption during pregnancy have only been recognized in the last 30 years. In 1973, Jones and Smith first used the term fetal alcohol syndrome (FAS) to describe a pattern of physical and developmental disabilities in eight infants who were born to alcoholic mothers (Jones, Smith, Ulleland, & Streissguth, 1973). FAS is characterized by growth retardation, specific facial anomalies, and central nervous system dysfunction (Stratton, Howe, & Battaglia, 1996; Warren & Foudin, 2001). Now recognized as the leading known cause of mental retardation (American Academy of Pediatrics, 2001; Burgess & Streissguth, 1990), FAS has a prevalence of between 0.5 and 2.0 cases per 1,000 births in the United States (May & Gossage, 2001). However, the diagnosis of FAS identifies only a small proportion of children affected by alcohol exposure before birth.

Other prenatal alcohol-related conditions such as alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD) are believed to occur approximately

three times as often as FAS (Centers for Disease Control and Prevention [CDC], 2003b). Recently, the term fetal alcohol spectrum disorder (FASD) has emerged to refer collectively to fetal alcohol exposure along a continuum (Jacobson & Jacobson, 2002). The prevalence of FAS and ARBD combined is likely to be at least ten per 1,000 or 1% of all births (May & Gossage, 2001). This is too high a prevalence for any population to accept (May & Gossage). The number of children diagnosed with FAS have striking implications for educational programs (e.g., If we consider children in the additional diagnostic categories, we may face an epidemic of alcohol-exposed children in the education system). Developmental delays and neurological dysfunction will affect the ability of these children to perform in school (Burgess & Streissguth, 1990).

### Effects of Prenatal Alcohol Exposure on Child Development

FAS causes permanent physical and mental damage in children born with FAS in all races and socioeconomic groups (American Academy

of Pediatrics, 2002). Birth defects ranging from alcohol exposure during pregnancy account for about 5% of all congenital anomalies (D'Apolito, 1998). Physical anomalies and central nervous system dysfunction present a wide array of problems in society for children with FAS.

### **Physical Effects of Prenatal Alcohol Exposure**

Physical characteristics of FAS include growth retardation (< 10th percentile for weight, length, and head circumference), structural abnormalities, and a distinctive pattern of facial anomalies, which include a thin upper lip, epicanthal folds and a missing philtrum (Streissguth & Little, 1994). Children who have dysmorphism are more likely to be cognitively impaired (Conroy, 1990). Medical problems often accompany a diagnosis of FAS. Some children develop hearing loss, strabismus, scoliosis, urinary tract infections, hypotonia, and epilepsy (Becker, Warr-Leeper, & Leeper, 1990; Lemoine & Lemoine, 1992). Hearing loss proves especially problematic in young children with FAS. In addition to problematic physical effects of FAS, children with FAS experience some form of central nervous system dysfunction.

### **Central Nervous System Dysfunction**

Central nervous system dysfunction may manifest itself in any of the following ways: (a) microcephaly (small head circumference), (b) poor coordination, (c) lower than average IQ, (d) hyperactivity, (e) attention problems, (f) teaming difficulties, (g) developmental delays, or (h) motor problems (Burgess & Streissguth, 1990). Alcohol produces by far the most serious neurobehavioral effects on the fetus when compared to other drugs including heroin, cocaine, and marijuana (Stratton et al., 1996). Central nervous system dysfunction, perhaps most important to educators, appears as cognitive differences and behavioral challenges (Burgess & Streissguth). Cognitive function can vary dramatically in children with fetal alcohol syndrome (Streissguth, Barr, Sampson & Bookstein, 1994; Streissguth, Randels, & Smith, 1991) as evidenced by IQ levels that can range

from normal to severely cognitively impaired (Streissguth, LaDue, & Randels, 1988).

Children with FAS exhibit problems with hyperactivity and attention (Burgess & Streissguth, 1990), learning and memory (Kerns, Mateer, & Streissguth, 1997), and socioemotional function (Coles, Brown, & Smith, 1991). Increased levels of irritability during infancy and the resultant poor maternal attachment contribute to behavior problems in children (Coles et al., 1991; Kelley, Day, & Streissguth, 2000). Children exposed prenatally to alcohol have been rated by their teachers as less socially competent and more aggressive in the classroom than children who have not been exposed prenatally to alcohol (Brown, Coles, Smith, Platzman, & Silverstein, 1991; Jacobson, Jacobson, Sokol, & Chiodo, 1998).

Carmichael-Olson, Feldman, Streissguth, and Gonzales (1992) administered the Vineland Adaptive Behavior Scale (VABS), a measure of social skills and emotional maturity, to the parents of adolescents with FAS and FAE. The most substantial deficits, based on the parents' responses, were in the socialization domain, which accesses interpersonal skills and the ability to conform to social conventions. The most prominent problems were failure to consider the consequences of one's actions, lack of responsiveness to social cues, and poor interpersonal relationships (Streissguth, Aase, et al., 1991).

### **Statement of the Problem**

Alcohol is the most frequently ingested teratogen in the world (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 1990). Prenatal alcohol use is a threat to healthy pregnancy outcomes for many U.S. women (CDC, 2003a). During 1999, approximately 500,000 pregnant women reported having one or more drinks during the preceding month, and approximately 130,000 reported having seven or more alcohol drinks per week or engaging in binge drinking of five or more drinks in a day (CDC, 2002). These heavier drinking patterns have been associated with FAS and ARND (Jacobs, Copperman, Jeffe, & Kulig, 2000).

### **Educational Implications**

Not until children enter school do their FAS-related behaviors become apparent. Students with FAS may be an enigma to school personnel, especially when the children have not been diagnosed or when the educational team is not aware of a diagnosis (Streissguth, 1997). Academically, children prenatally exposed to alcohol often lag behind their peers in mathematics and reading (Abel, 1998). They may recognize words, but their reading comprehension is poor. Writing and drawing skills are below normal (Morse, 1993).

Children with FAS present a unique challenge to the classroom teacher due to their unpredictable behavior. Students with FAS inadvertently divert attention from their primary disabilities by their inappropriate public behavior (Streissguth, 1997). Social interaction difficulties may hide communication impairment. Noncompliance may reflect a failure to understand. Sometimes neurological limitations may be masked by strengths the children possess. IQ scores alone are not sufficient for placement of FAS children in education programs (Streissguth; Streissguth, Barr, & Sampson, 1990).

IQ scores of children with FAS sometimes interfere with appropriate placement of these children in school. A ten-year follow-up of eight of the first 11 children diagnosed with FAS revealed that those with IQ scores below 70 were more appropriately placed in school and were living in more stable environments than those with IQ levels above 70 (Streissguth, Clarren, & Jones, 1985). Teachers may find it difficult to assist children with FAS, partly because no empirical research exists on the educational needs and resultant educational strategies for children with FAS (Streissguth, 1997).

The nature of FAS puts these children at risk for academic failure in the classroom. Children with FAS often achieve academically at lower than expected levels for other same-age youngsters (Burgess & Streissguth, 1990). In one longitudinal study, IQ scores ranged from 20-108 with individuals functioning at levels from normal to severely impaired (Streissguth et al.,

1988). Functional skills are often severely compromised in relation to both chronological age and intellectual ability. A marked discrepancy exists between seemingly high verbal skills and inability to communicate effectively. The combination of poor self-control and ineffective communication skills leads to frustration for students, teachers, and parents (Burgess & Streissguth).

Secondary disabilities resulting from FAS behavior may include mental health problems, chemical dependency, failure to develop appropriate sexual behavior, and legal problems (Streissguth, Barr, Kogan, & Bookstein, 1996). Secondary disabilities occur in people prenatally exposed to alcohol whether or not they meet the criteria of FAS, and these disabilities occur to a greater extent than would be predicted by the person's general intellectual functioning or demographic factors (Matteson, Shoenfeld, & Riley 2001). These secondary disabilities cause disruptions at school.

### **Executive Functioning and School Disruptions**

Some problems with staying in school relate to impairments in executive functioning (Matteson et al., 2001). Children with FAS have demonstrated impairments in executive functioning tasks (Kodituwakku, Handmaker, Cutler, Weathersby, & Handmaker, 1995; Matteson & Riley, 1999). Problem solving, thinking abstractly, planning ahead, and being flexible in thought processes prove problematic in children with FAS. Importantly in these studies, the children's deficits in executive functioning were unrelated to their overall intelligence levels. This finding is supported by a recent study among adults with FAS that found the subjects' deficits in executive functioning were greater than would have been predicted if they were related to overall IQ scores (Conner, Sampson, Bookstein, Barr, & Streissguth, 2000). Deficits in executive functioning have significant implications for people exposed prenatally to alcohol. These children may act without considering the consequences of their behavior, or they may have difficulty with activities that require problem solving or sequencing activities. These types of deficits

may explain why children with prenatal alcohol exposure, even those with average intelligence, have such difficulty succeeding in school.

Gorman (1995) conducted a study in which she personally interviewed 20 individuals with FAS between the ages of 15 and 20 to learn more about their perceptions of school. Of these individuals, 80% had had a disrupted school experience. Four who reported no disrupted experience indicated that someone at school really cared about them. This study confirms the importance of teachers' sensitivity towards children with FAS. The classroom teacher's attitude toward the child may be significant in influencing how well the child performs and how the child succeeds in overcoming his or her deficiencies (Hubbard, 1998).

#### **Attitudes and Teacher Attitudes**

Attitude has been defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p.1). "An evaluation is always made with respect to some entity or thing that is the object of the evaluation" (Eagly & Chaiken, p. 4). Thurston (1928) is the social psychologist credited with first formalizing and popularizing an attitude measurement methodology. Thurston's definition of attitude is based on a continuum that can be interpreted in any of the following ways: Attitude is (a) affect for or against, (b) evaluation of, (c) like or dislike of, or (d) positiveness or negativeness toward a psychological object (Mueller, 1986; Thurston, 1928). A teacher's attitude toward students will reflect itself along a continuum of favorability (Henerson, Morris, & Fitz-Gibbon, 1978). Attitudes are grounded in the teachers' beliefs; therefore, it is important that these beliefs be assessed in determining attitudes towards children with FAS. Teacher expectations also evolve from the teacher's beliefs. When teachers are susceptible to specific beliefs about a child, the teachers typically will behave in a manner that reflects those beliefs (Nieto, 1992). People who evaluate an attitude object favorably tend to engage in behaviors that foster or support it, and people who evaluate an attitude object unfavorably tend to engage in behaviors that

hinder or oppose it (Hubbard, 1998). The teachers' behavior in the classroom can be inferred from an assessment of their attitudes and beliefs towards particular students.

#### **Purpose of the Study**

Although children with FAS often have debilitating academic and behavioral deficits, they remain undetected and underserved by school programs (Burgess & Streissguth, 1990; Streissguth, 1997). Most state education systems do not recognize FAS as a distinct handicapping condition or as a separate funding category (Burgess & Streissguth). Children with FAS are often categorized as having mild, moderate, or severe retardation or as suffering from an emotional or behavioral disability (Burgess & Streissguth, 1990; Streissguth, 1997). Generic categories do little to define individual needs or appropriate interventions. When teachers are given only broad labels such as learning disabled, they are left with little information about the characteristics and needs of students with FAS. In order to be adequately served, students must receive appropriate medical, academic, and behavioral assessment and educational programming (Streissguth).

#### **Lack of Training and Experience With Children With FAS**

One of the problems many teachers face in developing expertise in working with children with FAS is lack of training and experience with FAS children (Kleinfeld & Wescott, 1993; Streissguth, 1997). Educators indicate they would like support and training regarding educating students with FAS; however, a 1995 survey of special education divisions in each of the 50 states revealed that none recognized or specifically served the needs of students based on a diagnosis of FAS nor did they have plans to do so (Wentz, 1997). It is suggested by this study that state education departments may not understand the needs of teachers regarding students with FAS.

#### **Disabilities and the Law**

The results from the survey of special education divisions are disturbing considering the legal connotation for children with disabilities. Legal directives have been established for inclusion of

children with disabilities with typical children in school programs (Education for All Handicapped Children Act, 1975, which was reauthorized as Individuals with Disabilities Education Act-IDEA, 1990, which was reauthorized as Individuals with Disabilities Improvement Act-IDEA, 2004; Hubbard, 1998). Adequate support services must accompany these directives if the population of children with special needs is to be adequately served. Children with FAS often have average levels of intelligence and verbal skills that imply an adequate level of communication; thus, they may not be detected as needing intervention in school (Burgess & Streissguth, 1990).

The reauthorization of the IDEA (Individuals With Disabilities Education Act Amendments, 1997; IDEA, 2004) contains requirements that will strengthen progress toward inclusionary practices (Moore, 2002). With the emphasis on inclusive classrooms, it is highly likely many children with FAS will be taught in the general education setting. Educators are responsible for collaborating and collectively assisting these children through the education system.

### **Interventions for FAS**

Children born with FAS and other prenatal alcohol exposure conditions need interventions that can reduce the effect of their cognitive and behavioral deficits. In a review of literature on adolescents and adults, Streissguth and O'Malley (2000) found that people who receive appropriate supportive services fare better with respect to secondary disabilities and life functioning than those who do not receive such services. Streissguth et al. (1996) identified eight factors that were universally protective in terms of secondary disabilities. Five of the eight factors relate to the child's environment. Protective environmental factors include (a) living in a stable and nurturing home of good quality, (b) not having frequent changes of household, (c) not being a victim of violence, (d) having received developmental disabilities services, and (e) having been diagnosed before six years of age. These protective factors give clear indication to families, service providers, teachers, policy planners, and communities about necessary actions to take to prevent and

overcome these secondary disabilities. Individuals at highest risk for development of secondary disabilities are those less disabled by conventional standards, yet they still possess fetal alcohol behaviors that get them into trouble. The field lacks systematic clinical trials addressing possible interventions (Randel, 2001). No clinical remedies exist to recommend for either specific or global fetal alcohol effects (Hannigan & Berman, 2000).

This research was a descriptive study using survey methodology to measure attitudes, knowledge, and perceived competence of a group of educators in educating students with prenatal alcohol exposure. The attitudinal object was children of alcohol- exposed births. The population consisted of 1st-grade teachers, 6th- to 8th-grade language arts teachers, 9th- to 12th-grade language arts teachers, and K-12 special education teachers in Santa Rosa County and Escambia County School Districts in northwest Florida. Okaloosa County School District declined to participate in the study. A paper and pencil survey assessing knowledge, attitudes, beliefs, and perceived competence in educating children with FAS was sent to a stratified random sample consisting of 124 first-grade teachers, 82 sixth- through eighth-grade language arts teachers, 112 ninth- through twelfth-grade language arts teachers, and 219 special education teachers in two school districts (i.e., Escambia and Santa Rosa) in northwest Florida. The random sample was drawn from a list of all teachers in the four respective groups within the two school districts. The study was exploratory in that it examined attitudes, knowledge, and behaviors of educators in the classroom towards children with prenatal alcohol exposure. To the researcher's knowledge, this was the first study of its kind conducted in northwest Florida school districts.

The goals of the research were (a) to assess the knowledge, attitudes, and beliefs of a group of teachers representing elementary, middle, and high schools in two school districts in northwest Florida toward students with fetal alcohol syndrome; (b) to determine teachers' perceptions of their competence and role in the educating of children with FAS; and (c) to ascertain among the participants in the study any correlation

between knowledge, attitude, and perception of competence in educating students with FAS.

### **Research Questions**

The following questions guided the research process. How do variables such as teacher training, years of experience, and age of teachers affect knowledge of fetal alcohol syndrome and the development of favorable or unfavorable attitudes toward alcohol-exposed children? Does knowledge of fetal alcohol syndrome correlate with attitudes toward children with fetal alcohol syndrome or perceived competence in working with children with fetal alcohol syndrome in the classroom? Does knowledge, attitude, or perceived competence differ between school districts, by teacher location, or by grade level of teaching?

### **Prevalence and FAS Surveillance in Florida**

Passive surveillance methods using birth certificates to determine the number of FAS births in Florida counties in 1996 revealed that 73 cases of FAS were diagnosed at birth (Florida Department of Health, 1999). This is equivalent to 0.4 per 1,000 live births which is slightly below the estimated prevalence of 0.5 to 2 per 1,000 live births for FAS births in the United States (May & Gossage, 2001). In 1996 there were approximately 70 cases of FAS in Escambia County (Burd, 2004). The birth defects registry did not report any cases of FAS live births in either Santa Rosa County or Okaloosa County in 1996 (Florida Department of Health, 1999). The passive surveillance method used in Florida may underestimate the prevalence of FAS as the lowest rates of FAS are consistently found with passive surveillance methods as opposed to active case ascertainment and clinic-based ascertainment methods (May & Gossage). The children born with FAS in 1996 are currently of school age. There is no way to estimate the number of children with FAS who may have moved to Florida after birth.

### **Conceptual Framework**

The conceptual framework used in this study was developed by Hubbard (1998) for a study involving educators' attitudes toward children of drug-exposed births. The conceptual framework evolved from the theoretical perspectives in an

ecological model of the child and school functioning (Bronfenbrenner, 1986) and the psychological construct of attitude (Mueller, 1986). The model has also been informed by an investigation of teacher expectations (Dotts, 1978; Dusek & Joseph, 1983) and the effect of those expectations on teachers' behavior and on the environments created for the students (Hubbard).

Bronfenbrenner (1979) described three levels of environmental factors that reciprocally interact with individual variables. The microsystem consists of interactions in a specific setting such as with family members. The mesosystem refers to interactions among settings such as among family, school, and work. The exosystem is the larger social system that can affect individuals through cultural beliefs and values. Bronfenbrenner's model demonstrates that environments can be conceptualized at various levels of integration (Glanz, Lewis, & Rimer, 1997).

### **Application of the Ecological Model**

Hubbard's (1998) model was developed based on a theoretical understanding of the impact of environmental factors (e.g., values and beliefs as well as educational training and experience) on the educator's attitude toward the child (positive, negative, or neutral) and, consequently, the impact of teacher attitudes on the child's sense of vulnerability and subsequent behavior over time (Bronfenbrenner, 1979; Eagly & Chaiken, 1993; Mueller, 1986). The model consists of a four-tiered conceptual framework derived from the perspective of ecological psychology, which guides the research process (Hubbard). The graphic representation in Figure A1 ([Appendix A](#)) illustrates the relationship among the four tiers of the study.

### **Significance of the Study**

The nature of the neurological damage in children with prenatal alcohol exposure puts them at risk for academic failure early in their educational experience. Children with FAS may have average IQ levels, but their cognitive disabilities such as those related to executive functioning are unrelated to their overall intelligence levels (Conner et al., 2000). Children with FAS continue to be underserved

by the education system; thus, many of them encounter a disrupted school experience and may drop out of school (Gorman, 1995). Appropriate interventions will only succeed if teachers are knowledgeable about FAS and sensitive to the needs of affected children.

Misconceptions can be detrimental to understanding the complicated life circumstances of individuals with FAS (Streissguth, 1997). Describing a behavioral phenotype of individuals with FAS is useful for better understanding the qualitative aspects of FAS, but it should never replace or underestimate the value of responding to individuals on the basis of their own needs, strengths, and weaknesses (Streissguth). Teachers need training in recognizing the common characteristics that result from brain damage in students with FAS as well as in recognizing their individuality, their uniqueness, and their own temperaments. Appropriate teacher training programs will enable teachers to employ a life-span approach with students with FAS focusing on the lifelong effects of the disease.

This study may be instrumental in challenging school districts to identify students with FAS and to determine how best to serve their needs. No systematic research exists on the educational needs of children with FAS or on the best educational strategies for meeting their needs (Streissguth, 1997). Educators have had to rely on observations of parents and caregivers for intervention techniques, many of which are the result of trial and error (Kleinfeld & Wescott, 1993). The research reviewed suggests that, through identification of students with FAS, educators can begin the process of determining the appropriate educational practices for this population.

### **Methodology**

Educators in two school districts were surveyed on their knowledge, attitudes, and perceived competence in educating students with fetal alcohol syndrome (FAS). The following questions, previously discussed in the introduction guided the research process;

1. How do variables such as teacher training, years of experience, and age of teachers affect knowledge of fetal alcohol syndrome and the development of favorable or unfavorable attitudes toward alcohol-exposed children?
2. Does knowledge of FAS correlate with attitudes toward children with FAS or perceived competence in working with children with FAS in the classroom?
3. Does knowledge, attitude or perceived competence differ between school districts, by teacher location, or by grade level of teaching?

### **Hypotheses**

The primary analysis of this study tested the following null hypotheses:

1. There is no relationship between knowledge, attitude, and perceived competence in working with children with FAS.
2. There is no difference between teaching experience and favorable or unfavorable attitudes toward children with FAS.
3. There is no relationship between teacher training and knowledge or attitudes towards children with FAS.

### **Sample**

The population consisted of 1st-grade teachers, 6th–8th-grade language arts teachers, 9th–12th-grade language arts teachers, and K-12 special education teachers in Santa Rosa County and Escambia County School Districts in northwest Florida. There were 941 teachers in this population consisting of 230 first-grade teachers, 126 sixth- through eighth-grade language arts teachers, 153 ninth- through twelfth-grade language arts teachers, and 432 K-12 special education teachers.

The Sample Size Calculator (Creative Research Systems, 2003) was used in calculating the sample size for each group of teachers with a confidence interval of 5 and a confidence level of 95%. The resulting sample included 124 first-grade teachers, 82 sixth- through eighth-grade language arts teachers, 112 ninth- through twelfth-grade language arts teachers, and 219 K-12 special education teachers for a total of 537

teachers as participants in the research. The sample size is adequate for representation of the population of teachers in each of the selected job titles in the two school districts.

#### **Procedure for Sample Recruitment**

Upon receiving approval for this project from the Institutional Review Board at The University of West Florida, a written description of the purpose and design of the research was hand delivered by the researcher to the assistant superintendent of schools in the three school districts in Florida requesting permission to conduct the research project within their school districts. The written description included a copy of the proposed research instrument.

The Assistant Superintendent of Human Resources in Santa Rosa County School District responded by e-mail requesting that the researcher call her to discuss the request. The Assistant Superintendent of Human Resources in Santa Rosa County School District recommended that the researcher approach each principal regarding her request to survey teachers in their respective schools rather than receiving a random list of teachers' names through the data processing department. A research request was distributed to each principal in the population in Santa Rosa County School District. Ten schools in Santa Rosa County School District agreed to participate in the study. The researcher hand delivered survey packets to these 10 schools in Santa Rosa County School District. The sample surveyed at the 10 schools in Santa Rosa County School District included 15 first grade teachers, 45 middle and high school language arts teachers, and 57 exceptional student services (ESE) teachers for a total of 117 teachers.

The researcher followed up her e-mail to Escambia County School District with a telephone call to the Assistant Superintendent of Human Resources to confirm his receipt of the research request. The proposed research followed all district policies for research using human subjects and school district employees, and the researcher was granted permission to survey a group of educators in the Escambia County School District.

A list of teachers in the population in Escambia County School District was obtained by searching the school district Web page for faculty at each school. If information regarding faculty was not available online, the researcher telephoned the respective schools inquiring about the numbers of teachers in each area needed for the research project. The researcher compiled a list of 1st-grade teachers, 6th-through 8th-grade language arts teachers, 9th-through 12th-grade language arts teachers, and ESE teachers for the entire school district. The population in Escambia County School District consisted of 152 first-grade teachers, 84 sixth-through eighth-grade language arts teachers, 100 ninth- through twelfth-grade language arts teachers, and 278 ESE teachers. The Sample Size Calculator (Creative Research Systems, 2003) was used in calculating the sample size for each group of teachers with a confidence interval of 5 and a confidence level of 95%. The resulting sample in Escambia County School District includes 109 first-grade teachers, 69 sixth- through eighth-grade language arts teachers, 80 ninth- through twelfth-grade language arts teachers, and 162 ESE teachers. Okaloosa County School District declined to participate in the research. The total sample from Santa Rosa County and Escambia County School Districts combined was 537.

#### **Procedure**

The research instrument used in this study consisted of a self-administered questionnaire ([Appendix B](#)) conducted largely through direct mailing, with some questionnaires being hand delivered to the schools. The questionnaires required approximately 10-15 minutes to complete including the demographic information. All surveys included a self-addressed stamped envelope with instructions for returning to the researcher upon completion. The respondents were asked to return the questionnaires within 30 days of the first mailing.

Approximately two weeks after the initial mailing of surveys, Hurricane Ivan struck the Pensacola area, damaging all of the schools in Escambia County and many schools in Santa Rosa County as well. The hurricane affected the



return of surveys in that schools were closed during much of the 30-day period that participants were instructed to return the surveys. In order to increase the response rate, a follow-up postcard was sent to all educators reminding them to complete and return the survey. After mailing the postcards, the researcher received several e-mails and phone calls stating that participants had not received the initial survey. The researcher mailed out 11 surveys as requested by these participants. The survey method of collecting data remained the optimal choice for this research problem.

### **Demographics**

Information was gathered from participants on their age, gender, and level of education. The form also asked teachers to indicate their area of specialization and the total number of years of teaching experience. The teachers were asked to indicate whether they have participated in any type of drug education coursework as part of their academic training or professional development. The survey inquired about teachers' perceptions of self-adequacy and training in relation to working with students with FAS. These questions provided information regarding how much background knowledge and experience the participant held about prenatal alcohol exposure and its toxicity, as well as their perspective of their own ability to work with children with FAS as a result of that knowledge.

### **Instrument Development**

The questionnaire (Alaska Department of Health and Social Services [Alaska DHSS], 2000) used in this study was adapted from a survey instrument, *Fetal Alcohol Syndrome in Alaska: Statewide Survey of Educators' Opinions and Classroom Experience* developed by the Alaska Department of Health and Social Services with funding from the U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Grant #5 UDI SP09198-02. The original instrument was developed to establish baseline data about Alaskan educators' knowledge about FAS and related disabilities.

The Department of Health and Social Services in Alaska convened a steering committee

responsible for developing the policies and procedures for Alaska's five-year comprehensive FAS prevention project. The steering committee was a diverse, multidisciplinary body representing both the public and private sectors and representing the fields of substance abuse, mental health, developmental disabilities, physical health, adult and youth corrections, child protection, education, the court system, Alaska Native issues, parents and caregivers, and evaluation, data collection, and surveillance (Alaska DHSS, 2000). The FAS steering committee brought together a broad spectrum of skills, expertise, and experience relevant to FAS and alcohol-related neurodevelopmental disorder (ARND). The survey and questionnaire protocols were selected by the evaluator of the Alaska project in collaboration with the project director and the steering committee. The resultant survey, *Fetal Alcohol Syndrome in Alaska: Statewide Survey of Educators' Opinions and Classroom Experiences*, was used in measuring educators' knowledge and attitudes toward students with FAS. The comprehensive knowledge of FAS displayed by the diverse steering committee ensured that the questions in the survey used in this study were valid.

In developing the *Fetal Alcohol Syndrome in Alaska: Statewide Survey of Educators' Opinions and Classroom Experiences*, the Alaska office of FAS program staff and the University of Alaska research staff utilized inter-rater reliability in determining the appropriate verbiage for each question on the survey. The use of inter-rater reliability methods in the development of the *Fetal Alcohol Syndrome in Alaska: Statewide Survey of Educators' Opinions and Classroom Experiences* instrument ensured that the survey was reliable.

The survey for this project included many of the questions from the original *Fetal Alcohol Syndrome in Alaska: Statewide Survey of Educators' Opinions and Classroom Experiences* with some additional questions added to the demographic section for the purposes of addressing the research questions relevant to this study population. A letter of support both for the study and for permission to use the *Fetal*

Alcohol Syndrome in Alaska survey were obtained from the State of Alaska Department of Health and Social Services, Office of FAS.

### **Content**

The survey consisted of 30 items and included the following categorical breakdown: (a) 17 items on respondents' demographics and personal characteristics such as work setting and experience, (b) eight items designed to assess respondents' overall knowledge about the topic of FAS, (c) four items designed to assess respondents' attitudes toward FAS and prevention of FAS, (d) one item designed to assess respondents' perceived competence in educating students with FAS. The last two items were open-ended questions inquiring about support that would be helpful to educators in dealing with students with FAS and personal strengths and expertise in educators which help them deal with students with FAS. Cronbach's alpha was used as a test of internal consistency on the three scales of knowledge, attitude, and perceived competence

**Knowledge.** The first section of the questionnaire (questions 1-4) assessed knowledge concerning alcohol consumption during pregnancy and its possible effects on a developing baby. Two questions in this section used a five-point Likert-type scale in which respondents were asked to indicate at which times during pregnancy consuming alcoholic beverages is safe for the developing fetus and how much alcohol consumption during pregnancy is safe for the developing fetus. The remaining questions in this section asked whether it was safe for a pregnant or nursing woman to have an occasional alcoholic beverage; answer choices were on a nominal scale with yes, no, and don't know as response options. Questions 8 through 11 assessed knowledge about the medical diagnosis of FAS, the causes of FAS, and possible effects of FAS on a person's capabilities. The first question in this section asked "How much do you know about the medical diagnosis called fetal alcohol syndrome?" Responses were nominal with "I've never heard of FAS," "I've heard of FAS," and "I know a lot about FAS" as some possible responses. The remaining three questions used

Likert-type scale items in their responses concerning knowledge of FAS.

**Attitude.** Another section of the questionnaire (questions 5, 6, 7, and 18) assessed attitudes toward drinking during pregnancy and beliefs about the educator's role in educating FAS students. The first question in this section inquired whether it was a woman's own business if she drinks during pregnancy. Responses were nominal with yes, no, and no opinion as possible choices. The remaining questions used a Likert-type scale in assessing attitude.

**Perceived competence.** Question 17 measured perceived competence in educating children with FAS. The item was comprised of seven subscales in which the participant chose responses on a Likert-type scale from strongly agree to strongly disagree including no opinion in the possible responses. All Likert-type scale items had either don't know or no opinion as possible responses.

### **Dependent Variables**

The dependent variables were reflected through three categories and were measured on an ordinal scale. The first dependent variable was knowledge of the topic of FAS. A total score on knowledge of FAS was tallied for each respondent. The score was computed by adding the responses for the questionnaire's eight objective items. Scores could range from 0 to 69. These items provided an objective measure of the respondent's knowledge and were not dependent on the respondent's opinions or preferences.

The second dependent variable was attitude. Scores on total attitude were computed by adding the responses to all questions in the section. Scores could range from 0 to 49. Perceived competence in working with students with FAS was assessed using question 20. The question, "Please indicate how strongly you agree or disagree with the following statements about working with your students" contained seven subcategories to which the respondent chose a response from strongly agree to no opinion. The total score on perceived competence was tallied for each respondent.

Scores could range between 0 and 28 and indicated either high or low perceived competence in their role as an educator of FAS students. All questions measuring knowledge, attitude, or competence used either a Likert-type or nominal scale with no opinion or don't know as an option in giving the answer.

### **Independent Variables**

Independent variables that were used in hypotheses testing included the educator's age, years and type of teaching experience, special or general education endorsement, and grade level of teaching. Other independent variables included the educator's educational level, and whether or not he or she had participated in professional course work involving drug and alcohol education. Questions about the types of agencies providing services for students with FAS as well as questions regarding referrals and educators' knowledge of pregnant students or students with FAS in their classes provided additional demographic information for addressing Research Questions 1 and 3. Independent variables such as type of teacher training (special or regular education) were measured using a nominal scale while those such as age of teachers and years of teaching experience were measured on an interval scale.

### **Threats to Validity**

The study had several threats to internal validity: (a) selection effects--the differences in the reasons the sample chose their area of concentration (special education or regular education); (b) individual history and the nature of previous alcohol education; (c) instrumentation -- completing the survey may have influenced participants' answers; and (d) reliability of the self-report. The first two threats may influence the results since the decision to enter the education profession as a teacher of special education indicates a difference in intrinsic motivation or goals and educational process. The course work and learning exposure of special education will vary from that of the regular classroom teacher in formal academic programs. There may be a difference in the nature of available course work in the area of substance abuse or drug education. It is possible that some students may be required to complete

full college credits in this area while others may be provided an opportunity to attend a seminar.

The threat of the reliability of self-report in research is not new. The instrument may have influenced some subjects to answer in what they felt was a socially accepted manner for someone in their profession. Participants in research studies have traditionally been burdened with possibilities of bias in various forms throughout time (Hubbard, 1998). By indicating the importance of the participants' responses in developing future education programs for affected students and the possibility of improved professional development, the researcher lessened the threat of bias from self-report.

A threat to external validity was the willingness of the sample to participate. A low return rate of the surveys could have resulted in decreased sample size and, therefore, would have reduced the validity of the results. The findings in this study could not be generalized to all teachers in all grade levels in the two districts surveyed. Results only applied to 1st-grade, 6th-8th-grade language arts, 9th-12th-grade language arts, and special education teachers in the two school districts. A cover letter explaining the importance of the survey results attempted to ensure an adequate response rate to ensure the validity of findings.

### **Data Collection and Analysis**

The purpose and significance of the study were explained in a cover letter sent to all participants. The letter stated that there were no known risks to subjects due to their participation in the study. Respondents were assured of the confidentiality of their responses as no identifying information was requested and the surveys were to be returned to the investigator in a sealed stamped envelope. The letter indicated that participation in the study was voluntary and only summary results would be reported. Respondents were assured that no tracking of returned questionnaires would occur as reminder postcards would be sent to all participants as indicated in the cover letter.

Upon receiving the approval of the assistant superintendents in Escambia and Santa Rosa

County School Districts, the researcher distributed the surveys to the respective school districts. The teachers were instructed to return the survey to the researcher in the stamped envelope provided.

Data for this study were collected using quantitative and qualitative data collection procedures. Responses to the questionnaire were computer analyzed using the Statistical Package for the Social Sciences (SPSS, 2001). The primary analysis of the study assessed the knowledge, attitudes, and beliefs about children with FAS in the education system among a group of 1st-grade teachers, middle and high school language arts teachers, and special education teachers in northwest Florida. Participants' perceptions of competence in their role in the educating of children with FAS were also assessed. In focusing on the three categorical variables of knowledge, attitudes, and perceived competence, the study had an additional goal of determining if any relationship existed between knowledge, attitudes, and perception of competence.

#### **Statistical Procedures**

**Frequencies.** In data analysis, a frequency distribution of all variables was first examined for outliers and any data entry errors. This allowed for examining each variable separately to determine possible areas of weakness in professional preparation of teachers and any areas for possible future research concerning children with FAS in the education system. Second, a Chronbach's alpha reliability analysis was conducted on each set of items measuring knowledge, attitude, and perceived competence. This analysis measured internal consistency among items in each scale that contributed to internal validity.

**Correlations.** Correlation analysis was used in testing the relationships between knowledge, attitude, and perceived competence in the group of educators surveyed. Spearman Rank-Order Correlation Coefficients was used in examining the existence of relationships between knowledge and perceived competence, between knowledge and attitude, and between attitude and perceived competence. All correlation

coefficients were tested at the .05 level of significance.

**Analysis of Variance (ANOVA).** Next, ANOVA procedures were used to determine whether there were differences in the attitudes of groups of teachers. The Friedman's ANOVA, a nonparametric equivalent to the two-factor randomized block ANOVA model (Lomax, 2001), was conducted using type of teacher training, special education or regular education, and years of teaching experience as the independent variables. The dependent variable was attitude. A two-tailed test tested hypotheses of no difference between years of teaching experience and attitude or between types of teacher training and attitude. The Friedman test assumes that the population distributions have the same shape (although not necessarily normal) as well as the same variability, and the dependent measure is continuous (Lomax). A second Friedman's ANOVA was conducted using knowledge as the dependent variable and type of teacher training and years of teaching experience as the independent variables. This test also employed a two-tailed test.

Finally, Friedman's ANOVA was conducted using grade level of teaching and teaching location as the independent variables and perceived competence as the dependent variable. Grade level of teaching was chosen as one of the independent variables because children with FAS are likely to vary dramatically in cognitive function (Streissguth, Barr, et al., 1994; Streissguth et al., 1991), and their academic and behavioral performance may manifest itself differently during different levels of development (Streissguth, 1997). The alpha level was set at .05 for all two-tailed statistical analysis in this study using the Friedman's ANOVA procedure.

Teaching location was chosen as the independent variable because there were differences in the economic makeup of the student populations in the two school districts. According to the U.S. Census Bureau (2000) the poverty rate in Escambia County (12%) was higher than either Santa Rosa (7.9%) or Okaloosa County (8.8%). In families with a

female householder (in which no husband is present) and with children under 5 years of age, the poverty rates were higher in Escambia (57.1%) and Santa Rosa (55.3%) Counties than in Okaloosa County (46.4%). These numbers likely affected the number of children with FAS encountered by teachers in school since low socioeconomic status (SES) leads the list of social variables that have been found to be associated with FAS births both in the United States and other parts of the world (Abel, 1995, 1998; May & Gossage, 2001). Of the two school districts surveyed, Escambia County was the only one with a poverty rate higher than the national average. According to Lewin (1936), the outside environment described by teaching location and grade level of teaching influences the person, his thoughts, and behaviors.

Responses to the last two open-ended questions were analyzed using qualitative data analysis procedures. The researcher employed inductive analysis in analyzing responses to each question attempting to identify core consistencies and meanings within the responses to each. Sensitizing concepts were used in forming categories of responses. In the confirmatory stage of analysis, data that did not fit any of the categories or patterns were reexamined. In reporting the final analysis of the qualitative portion of the survey, questions of reflexivity and voice were first asked as part of the process of engaging the data and extracting the findings. Whose voices were represented and the messages they wanted to send concerning support in dealing with students with FAS and their strengths in dealing with students with FAS were considered in the final analysis. Another question considered in analysis was "How do those studied know what they know" (Patton, 2002, p. 66). Does their knowledge seem to stem from professional preparation or from practical experience? Careful analysis of the data revealed the answers to these questions.

#### **Data Presentation and Analysis**

One hundred and fourteen teachers completed and returned the survey yielding a response rate of 21%. The return rate is consistent with expectations for mailed surveys (Meha & Sivadas, 1995; Neutens & Rubinson, 2002).

Data are described in tables followed by hypotheses testing.

A Chronbach's alpha reliability analysis was conducted on each set of items on the survey measuring knowledge, attitude, and perceived competence. The Chronbach's alpha reliability coefficient for the set of items measuring knowledge was  $\alpha = 0.92$ . The Chronbach's alpha reliability coefficient for the set of items measuring attitude was  $\alpha = 0.79$ . The Chronbach's alpha reliability coefficient for the set of items measuring perceived competence was  $\alpha = 0.80$ . These coefficients indicated that the scales for knowledge, attitude, and perceived competence were reliable measures.

Hubbard's (1998) ecological model on which the study was based was developed on a theoretical understanding of the impact of environmental factors (e.g., values and beliefs as well as educational training and experience) on the educators' attitudes toward the child and, consequently, the impact of teacher attitudes on the child's sense of vulnerability and subsequent behavior over time (Bronfenbrenner, 1979; Eagly & Chaiken, 1993; Mueller, 1986). Attitudes are based on values and beliefs within the mesosystem; teachers' attitudes and interactions towards students vary based on individual expectations and prior experiences (Bronfenbrenner; Eagly & Chaiken). See Appendix A for a visual description of Hubbard's ecological model. Information on teacher training and experience provided clearer understanding of the outcomes relating to attitude of teachers toward FAS students. Demographic data were analyzed within the theoretical framework of the study.

#### **Data Presentation**

**Demographic Background.** Nine items on the survey asked respondents about their educational background and teaching experience as well as other background information such as teaching location, gender, and age. Participants were asked to identify their main work location by city or town. Educational background inquiries included type of teacher training, special education or regular education, highest educational degree, and identification of the

institution from which they earned their professional degree. Participants were asked how many years they had been teaching and how many years they had been teaching at their present location. Teaching experience of those participating in the research clustered in two broad ranges. Forty seven percent of the respondents had ten years or less of teaching experience while only 16% had more than 25 years of teaching experience.

Respondents were asked to report the year in which they were born, and their responses were converted to age in years for data analysis. Age of participants also fell into two clusters -- 25 to 35 years of age, and 46 to 55 years of age. Professional teacher training for participants in the second age cluster may not have included information on FAS. If participants in the last cluster completed their professional training in the 1970s or early 1980s, and have received no subsequent training on the topic, it is unlikely they are knowledgeable about FAS.

The largest percentage (54%) of participants taught in Pensacola; 57% of the teachers held a special education certification. Fifty-eight percent of participants held a professional degree from The University of West Florida. Eighty-three percent of participants had not had any formal coursework in alcohol or drug education as part of their professional teaching preparation.

**Knowledge and Attitude in the Theoretical Framework.** The conceptual framework of the research evolved from Bronfenbrenner's (1986) theoretical perspectives in an ecological model of the child and school functioning and the psychological construct of attitude (Mueller, 1986). The four tiers within the framework describe levels of environmental factors that reciprocally interact with individual variables. Many factors (e.g., intrapersonal, social and cultural environments and physical environments) can influence attitude and behavior. Attitude and knowledge reciprocally interact within the ecological model. Eight questions in the survey measured knowledge and four questions measured attitude toward students with FAS. One of the questions measuring

knowledge of FAS is discussed in conjunction with two questions measuring attitude to examine the relationships between knowledge and attitude and to develop an understanding of how attitudes toward students with FAS may develop.

Eight questions measured knowledge and attitudes toward alcohol consumption during pregnancy; 61% of participants said there was no safe level of alcohol consumption during pregnancy. In that research reports there is no safe level of alcohol consumption during pregnancy (Centers for Disease Control and Prevention [CDC], 2004, 2005), this finding raises concern. Increasing this concern are the characteristics of study participants: the majority (93%) are female with 46% of childbearing age. The question "What do you think is the most alcohol that a woman could drink during her pregnancy that would probably be safe for her developing baby?" measured knowledge of the development of FAS. Knowledge of FAS should reciprocally affect attitudes according to the ecological model. However, family, values, peers, and beliefs can also affect knowledge and attitudes towards FAS. Societal norms and values interact within and across the macrosystem and the microsystem in the development of behaviors regarding alcohol consumption during pregnancy. A teacher's attitude and knowledge about FAS may not only affect her behavior in the classroom, but outside the classroom as well. Women who are not knowledgeable about risks of alcohol consumption during pregnancy may put their own pregnancies at risk for FAS. In response to the question "Do you think it is her own business if a woman drinks alcoholic beverages during pregnancy?" 75% responded no. This question was concerned with societal norms and values and relates to how values affect attitudes in the mesosystem in Hubbard's (1998) ecological model.

Cultural and societal norms affect the development of values, knowledge, and beliefs about FAS. These values and beliefs about FAS interact with societal norms in the development of attitudes toward FAS. One question in the attitude scale inquired about how likely

participants would be to talk with a pregnant friend or relative about the effects of alcohol on a developing baby. Participants answered five statements regarding how much alcohol the pregnant friend or relative drank during her pregnancy. Answers were on a Likert-type scale ranging from highly likely to no opinion. Responses of highly likely indicated positive attitude and answers of unlikely and highly unlikely indicated negative attitude towards FAS. Research Question 2 asked if knowledge of FAS correlates with attitudes toward children with FAS. Hypothesis 1 states "There is no relationship between knowledge, attitudes, and perceived competence in dealing with students with FAS." The survey questions regarding likelihood of talking with a pregnant friend or relative about alcohol consumption during pregnancy explored the relationship between knowledge of alcohol consumption patterns as they relate to development of FAS and attitude toward FAS.

Responses to items regarding how likely respondents would be to talk with a pregnant friend or relative about the effects of alcohol on a developing baby are displayed in Table 1. Participants were more likely to talk with a

friend if she drank one or two drinks a day during her pregnancy (95.6%) and if she drank five or more drinks on one occasion (88.6%) than if she drank one or two drinks a month during her pregnancy (47.4%). As the amount of alcohol consumed during pregnancy increased, the percentage of responses indicating high likelihood of talking with the pregnant friend or relative about drinking during pregnancy increased. Although the Surgeon General's Advisory on Alcohol Consumption During Pregnancy (CDC, 2005) says no amount of alcohol consumption can be considered safe during pregnancy, the responses to the survey question about talking with a pregnant friend about alcohol consumption during pregnancy indicate wide discrepancies in the likelihood of talking with a friend at lower and less frequent rates of alcohol consumption. Although these responses indicate an awareness of detrimental drinking patterns and their possible effects on the unborn, they also raise the question of how societal norms may affect attitudes toward alcohol consumption during pregnancy. The findings presented in Table 1 reflect the effects of societal norms on attitude development toward alcohol consumption during pregnancy.

Table 1  
Educators' Percentage of Responses to Fetal Alcohol Syndrome Survey Question (N=114) "With the Next Five Statements, Please Indicate How Likely it is That You Would Talk to a Pregnant Friend or Relative About the Effects of Alcohol on a Developing Baby if:"

Statements	Percent of Responses				
	Highly likely	Likely	Unlikely	Highly unlikely	No opinion
Your friend or relative drank 1 or 2 alcoholic beverages during her entire pregnancy	27.2	21.1	17.5	33.3	.9
Your friend or relative drank 1 or 2 alcoholic beverages a month during her pregnancy	47.4	28.9	11.4	11.4	.9
Your friend or relative drank 1 or 2 alcoholic beverages a week during her pregnancy	73.7	21.1	2.6	2.6	0
Your friend or relative drank 1 or 2 alcoholic beverages a day during her pregnancy	95.6	3.5	0	.9	0
Your friend or relative drank 5 or more alcoholic beverages on any one occasion during her pregnancy	88.6	7.9	1.8	1.8	0

**Knowledge of FAS.** Survey Question 9 asked participants to indicate how strongly they agreed or disagreed with six statements regarding FAS.

Responses to knowledge items about people with fetal alcohol syndrome are displayed in Table 2.

Table 2  
Percent of Responses to Knowledge Statements Regarding People With Fetal Alcohol Syndrome (FAS) Among Participants in Fetal Alcohol Syndrome Survey (N=114)

Statements	Percent of responses				
	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	No opinion
People with FAS have a set of birth defects	25.4	50.0	8.8	.9	14.0
People with FAS have brain damage	35.1	45.6	7.9	0	10.5
People with FAS have mental retardation	19.3	41.2	20.2	5.3	13.2
People with FAS are affected physically	26.3	45.6	11.4	2.6	13.2
People with FAS will outgrow these effects	53.5	26.3	3.5	5.3	10.5
People with FAS have these effects throughout adulthood	47.4	37.7	1.8	.9	11.4

While participants tended to agree (35.1% strongly agreed and 45.6% somewhat agreed) that people with FAS have brain damage, 53.5% answered incorrectly that people with FAS will outgrow these effects. These responses indicate a discrepancy in knowledge of the long-term effect of FAS. This raises some concerns about educational planning for students with FAS. Since the effects of FAS last a lifetime, educational strategies should focus on functional skills (Streissguth, 1997; Streissguth & Burgess, 1992). "Functional skills are those activities which meet the needs of an individual and prepare him or her to live with as little outside support as possible" (Streissguth & Burgess, p. 25). Educators who are unaware of the lifelong consequences of FAS have the potential to make uninformed choices when developing an educational plan for students with FAS.

On questions regarding diagnosis and referral of students with FAS in northwest Florida, only 20% answered correctly that a diagnosis of FAS does not qualify a student for Exceptional Student Services in Florida. Eighty-three percent did not know whether FAS screening or diagnostic services were available in their school

district and 93% had never referred a student for an FAS screening or diagnosis. Eighty-three percent responded that they strongly disagreed that they had received training in the past year that was directed specifically at educational strategies for working with FAS students. Twenty percent strongly disagreed that there were alternative resources or special education strategies in their classroom or at the school to help students who have FAS. Although these questions are not part of the total knowledge scale in the Fetal Alcohol Syndrome Survey, they do reflect knowledge of policy and availability of resources relating to educating students with FAS. Responses indicated a lack of knowledge among educators regarding Exceptional Student Services policies as they relate to FAS and the need for alternative resources to aid in the education of students with FAS.

### Hypothesis Testing

The three null hypotheses delineating the research questions were tested statistically using the Spearman rank order correlation coefficient and Freidman's ANOVA procedures. In testing



all hypotheses  $\alpha = .05$ . The ANOVA procedure used a two-tailed test.

**Hypothesis 1.** The Spearman rank order correlation coefficient ( $\rho$ ) was used in testing Hypothesis 1, there is no relationship between knowledge, attitude, and perceived competence in dealing with children with FAS. Displayed in Table 3 are statistically significant positive correlations ( $\rho_a = .22, p < .05$ ) between total knowledge and perceived competence and total

knowledge and total attitude ( $\rho_b = .35, p < .01$ ). A significant correlation ( $\rho_c = .22, p < .05$ ) was found between total attitude and total competence. Hypothesis 1, there is no relationship between knowledge, attitude, and perceived competence in dealing with children with FAS, was rejected. These findings reflect the reciprocal nature between knowledge and attitude depicted in Hubbard's (1998) model of the conceptual framework.

Table 3  
Spearman Rank Order Correlation Coefficients for Three Scores on the Fetal Alcohol Syndrome Survey in a Group of Northwest Florida Educators

Measure	Attitude	Knowledge	Perceived competence
Total attitude	1.00		
Total knowledge	.35**	1.00	
Total perceived competence	.22*	.22*	1.00

\*  $p < .05$ ; \*\*  $p < .01$

**Hypothesis 2.** There is no difference between teaching experience and favorable or unfavorable attitudes toward children with FAS.

Friedman's ANOVA was used in testing Hypothesis 2. The dependent variable, attitude, is measured on an ordinal scale. Results of the rankings of the three variables, attitude, type of teacher training (regular education or special

education) and years of teaching experience are displayed in Table 4. Results indicated that the rankings were statistically significant across attitude, type of teacher training, and years of teaching experience ( $\chi^2[2, N = 114] = 211.7, p < 0.001$ ). Hypothesis 2, there is no difference between teaching experience and favorable or unfavorable attitudes toward children with FAS, was rejected.

Table 4  
Chi-Square of Total Attitude Score by Type of Teacher Training and Years of Teaching Experience for Participants in Fetal Alcohol Syndrome Survey

Variable	Mean rank	df	$\chi^2$
Total attitude	2.96	2	
Type of teacher training	1.04	2	
Years of teaching experience	2.00	2	211.721***

\*\*\* $p < .001$

The Scheffe post hoc multiple comparison procedure was conducted to determine where significant differences occurred. Scheffe's test did not reveal significant differences ( $p = .204$ )

in the total attitude rankings for type of teacher training. Post hoc tests were not performed for total attitude and years of teaching experience

because at least one group had fewer than two cases.

**Hypothesis 3.** There is no relationship between teacher training and knowledge or attitudes towards children with FAS.

A Friedman's ANOVA was conducted with knowledge of FAS as the dependent variable and type of teacher training and years of teaching experience as the independent variables. The results of the rankings of the three variables are displayed in Table 5. Results indicated that the rankings were statistically significant across knowledge, type of teacher training, and years of

teaching experience ( $\chi^2[2, N = 114] = 209.8, p < 0.001$ ). Hypothesis 3, there is no relationship between teacher training and knowledge or attitudes toward children with FAS, was rejected.

Scheffe's post hoc multiple comparison procedures were conducted to determine where the relationship occurred. Results ( $t = 6.66, p < .05$ ) indicated that the differences in total knowledge rankings occurred in type of teacher training. Post hoc tests were not performed for total knowledge and years of teaching experience because at least one group had fewer than two cases.

Table 5  
Chi-Square of Total Knowledge Score by Type of Teacher Training and Years of Teaching Experience for Participants in Fetal Alcohol Syndrome Survey

Variable	Mean rank	df	$\chi^2$
Total knowledge	2.95	2	
Type of teacher training	1.04	2	
Years of teaching experience	2.01	2	209.814***

\*\*\* $p < .001$

Research Question 1, "How do variables such as teacher training, teaching experience, and age of teachers affect knowledge of FAS and the development of favorable or unfavorable attitudes toward alcohol exposed children?" is examined in the Friedman's ANOVA presented in Table 5. In Hubbard's (1998) conceptual framework (Appendix A) teaching experience and teacher training in the exosystem affects attitude, values, and beliefs in the mesosystem and the microsystem. These interactions reflect the reciprocal nature of the development of competence, attitude, and knowledge of FAS.

A third Friedman's ANOVA examined Research Question 3, "Does knowledge, attitude, or

perceived competence differ between school districts, by teacher location, or by grade level of teaching?" Total competence was the dependent variable and grade level of teaching and teaching location were the independent variables. Teaching location and grade level of teaching are two factors comprising teaching experience. The results of the rankings of the variables perceived competence, grade level of teaching, and teacher location are displayed in Table 6. Results indicated that the rankings were statistically significant across competence, grade level of teaching and teaching location ( $\chi^2[2, N=114] = 165.3, p < 0.0010$ ).

Table 6  
Chi-Square of Total Perceived Competence Score by Teaching Location and Grade Level of Teaching for Participants in Fetal Alcohol Syndrome Survey

Variable	Mean rank	df	$\chi^2$
Total perceived competence	2.95	2	
Teaching location	1.04	2	
Grade level of teaching	2.01	2	165.232***

\*\*\*p<.001

Scheffe's post hoc multiple comparison procedures were conducted to determine where the differences in perceived competence occurred. No significant differences were found in the total perceived competence rankings according to teaching location ( $t = 7.32$ ;  $p=.429$ ). Post hoc tests were not performed for total perceived competence and grade level of teaching because at least one group had fewer than two cases.

#### Qualitative Analysis

Several themes emerged in the qualitative analyses of two open-ended questions regarding support in educating students with FAS and strengths in educating students with FAS. The major themes that emerged in response to support in educating students with FAS were teacher training, parental support, and professional support. Participants appeared to be especially interested in learning more about FAS in order to become more effective teachers with this special population. Reflexive voice of the participants expressed a willingness to share the burden of FAS; however, they perceived few if any professional development opportunities available to further educate them on FAS.

The major themes that emerged in response to the question regarding strengths in dealing with students with FAS were experience, educational background, and adaptability. Some participants perceived having taught students with FAS as a positive experience and some perceived it as a negative experience; however, they all perceived teaching students with FAS as a learning experience. An overarching theme that emerged from the responses relating to strengths was empathy; "compassion, common sense, loving,

and listening" were some of the participants' comments. Through better understanding the student's life experience, the teacher felt better prepared to participate in the education of that student.

One participant made a noteworthy comment to the question "Have you completed any formal coursework in alcohol or drug education as part of your professional teaching preparation?" The response indicated that such a course would have been helpful, as well as a course on poverty. Since poverty is a risk factor for having a child with FAS (May & Gossage, 2001), such a course would be helpful to teachers in understanding the dynamics of the family living with alcohol misuse or abuse.

#### Discussion

##### Consistencies With Previous Research

Results of the research indicated consistencies with previous research on the topic of FAS. Findings were consistent with results of Alaska's statewide survey of professional's knowledge and attitudes regarding FAS (Alaska DHSS, 2003). Few of the educators surveyed in either Alaska (5.74%) or Florida (7.9%) strongly agreed that they had the skills and knowledge that they needed to deal effectively with students with FAS. These findings confirm the need for more FAS training and resources for educators.

Analyses of the qualitative responses also were consistent with previous research regarding educators and FAS. Responses concerning types of support that would be helpful in dealing with students with FAS such as (a) training to identify children with FAS and how to deal with them in school and (b) knowledge of potential

behavioral or academic problems the students may have were consistent with Boettcher's (1995) findings. Boettcher found that educators most wanted to learn about information relevant to their professional environment, such as effective classroom techniques and cognitive limitations of a child with ARBD.

The most salient theme that emerged regarding strengths in dealing with students with FAS was expressed as experience. Respondents who had taught students with FAS or who had experienced alcohol abuse in their family or work force viewed their experience as a strength in helping them understand the life experience of alcoholism or FAS. These findings are consistent with earlier studies of educators and perceptions of FAS. Binns (2001) found that educators who had more direct personal experience with students with FAS and fetal alcohol effects (FAE) were more knowledgeable, had better perceived skills, and had more confidence in these skills than educators who had worked with fewer students with FAS and FAE.

Teaching in Exceptional Student Services (ESE) was perceived as a strength among participants in the study. Binns (2001) found that participation in the special education process and identifying FAS and FAE as a significant problem in one's own community were significant positive predictors of knowledge of FAS (Binns). These findings are consistent with the results of the Scheffe post hoc multiple comparison procedure that revealed that the differences in total knowledge rankings occurred in type of teacher training.

#### **Educational Placement**

Results of the Friedman's ANOVA led to a rejection of hypothesis three; there is no relationship between teacher training and knowledge or attitudes towards children with FAS. Through FAS training, educators can become more aware of how their attitudes towards students may be reflected in their classroom behavior. The sense of community and cooperation, such as the cooperation between the parents and the school, is important in the education and care of students with FAS

(Streissguth et al., 1996). Promoting communities, families and clients with FAS working together will benefit students with FAS throughout their lives (Streissguth et al., 1996).

It is equally important for teachers to realize their appropriate roles in the education and care of students with FAS. Requested support from these participants included "diagnostics strategies" and "need to know how to diagnose it (FAS)." Teachers need to be educated about their potential role in the screening process for FAS. With appropriate teacher training in FAS, students may no longer remain undetected and underserved by school programs. Since the teacher is often the first person to detect neurodevelopmental delays in students with FAS, an increase in knowledge among teachers may result in appropriate placements for students with FAS.

#### **Professional Preparation**

Educators' indications that they would like support and training regarding educating students with FAS are consistent with previous findings in which educators requested training in FAS (Boettcher, 1995; Wentz, 1997). Participants comments indicated that a course in alcohol or drug addiction would have been helpful, as well as a course on poverty. Including a course on poverty in teacher professional education programs would be helpful to teachers in understanding the life experience of children who are raised in poverty. Information obtained through participation in a poverty course may also aid teachers in reducing fear or anxiety they may face in educating special needs students.

A risk reduction approach might begin with lowering the risk factors that students with FAS face in the education system. Educating teachers in the developmental effects of FAS will benefit the students through reducing secondary disabilities and ensuring students are placed in the least restrictive environment. The discrepancy between what educators expect of students with FAS and what educators perceive them actually doing creates the climate for secondary disabilities to develop (Streissguth, 1997). Theoretically, if educators understand the

primary disabilities of FAS better, some secondary disabilities might be prevented (Streissguth).

Perhaps training teachers in empathy might help enhance students' abilities to form relationships. One participant wrote, "I have known only one student with FAS. She had great difficulty with peer relationships." If teachers can increase sensitivity to students with FAS through training, perhaps the disrupted school experiences may be fewer in this group. One participant in the FAS survey wrote, "I have great empathy for students with disabilities because my stepson has learning disabilities. I know how hard it is to overcome such a disability, but I also know that with proper support and encouragement the disability can be turned into ability." Teacher training in empathy can potentially affect the mesosystem through interactions among settings such as school, family, and work. A thorough understanding of the student with FAS in his daily environment will aid teachers in developing effective educational plans for these students.

### **Recommendations**

Based on the findings discussed in this research the following recommendations evolved.

1. Educators in northwest Florida should be presented with appropriate preservice and inservice educational opportunities on FAS. Professional teaching institutions should take the lead in creating the next generation of education professionals who are adequately trained to educate students with FAS.
2. School district administrators should devise a plan for dissemination of information on the cognitive and behavioral effects of FAS and other prenatal alcohol conditions to all school personnel, especially teachers. By organizing for FAS at the district level, a coherent system of planning can take place for individuals suspected of having FAS as they move through the various schools and programs of the district (Streissguth, 1997).
3. School district administrators in northwest Florida should implement screening for prenatal alcohol exposure to drugs and alcohol in the health screening for entrance into the school system.
4. School district administrators in northwest Florida should inform school personnel of referral procedures for students suspected of prenatal alcohol exposure.
5. Preservice and inservice sessions should be directed toward providing information on FAS that is relevant to the participants' environment. Effective classroom techniques and cognitive limitations of the student with FAS are examples of types of relevant information requested by teachers.
6. A program modeled after Alaska's Web-based fetal alcohol spectrum disorders training module (Alaska Department of Education and Early Development, 2004) could offer effective preservice and inservice training for educators in northwest Florida. An electronic course that allows participants to choose a tract and only view information that is relevant to their environment would aid participants in planning effective programs for their students with FAS.
7. Additional inservice sessions for educators should provide them with information relative to aiding students with FAS in forming peer relationships. Inservice training in communication would be helpful to educators in teaching social skills to the students with FAS.
8. School district administrators should foster more positive attitudes towards students with FAS through teacher training in empathy. Developing an understanding of the life experience of FAS may foster more positive attitudes in educators.
9. Professional teacher preparation in northwest Florida should include a course in alcohol and drug abuse and poverty. Eighty three percent of participants had not had any formal course work in alcohol or drug education as part of their professional teacher preparation.
10. School district personnel need to reduce fear among educators of students with FAS as well as reduce stereotyping of students with FAS and their families.
11. School districts should implement a plan to establish support groups within individual

schools for educators and students with FAS and their families. The sharing of information within the support group may lead to better understanding of academic and behavioral difficulties experienced by students with FAS.

12. A central clearinghouse of information addressing educators' informational needs regarding FAS should be established and made assessable to teachers both at the state and national level.
13. Provision for intervention services to all students with FAS should be assured by the inclusion of fetal alcohol spectrum disorder (FASD) as a qualifying disabling category for educational services through the Access to Postsecondary Education and Meaningful Careers for Students With Disabilities Act (Florida Statutes, 2004). Education of educators, legislators, parents, and other constituents will ensure progress towards the goal of including FASD as a disabling category.

#### **Suggestions for Future Research**

Additional research on teachers' attitudes toward children with FAS will provide a basis for dispelling negative attitudes and misconceptions about FAS and the children affected by the disability. Qualitative studies involving interaction and extensive interviews with teachers who teach children with FAS can provide the basis for further research and program development.

Research opportunities exist for the facilitation of learning in children exposed prenatally to alcohol. Research into the role of assistive technology in facilitation of learning in students with FAS is needed, especially in regard to

development of communication skills in this group of students. Research into learning facilitation in students with FAS combined with research in behavioral interventions may improve the quality of life for individuals with prenatal alcohol exposure.

Research opportunities exist for establishing a curriculum in functional skill development for students with FAS. Degree of cognitive and physical limitations vary among individuals with FAS; therefore, a flexible curriculum involving functional skill development is mandatory in assisting these individuals in reaching their full potential.

Future intervention efforts should focus on research on the behavioral factors related to prenatal alcohol exposure. Focus groups with parents and caregivers of children with FAS will provide valuable information regarding development of appropriate behavioral interventions. Studies involving incarcerated adults or adolescents with FAS may provide insight into their psychological and emotional profiles. In addition to research involving individuals with FAS, future research should focus on teacher training programs.

Comparison of the content about developmental disabilities contained in various professional teacher preparation programs may provide a basis for further research on teachers who work with children with FAS. Consistency in teacher training represents an important aspect of program development for children with FAS. Future research involving all aspects relative to educating students with FAS will continue to improve quality of life for individuals with FAS.

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## Appendix A Conceptual Framework

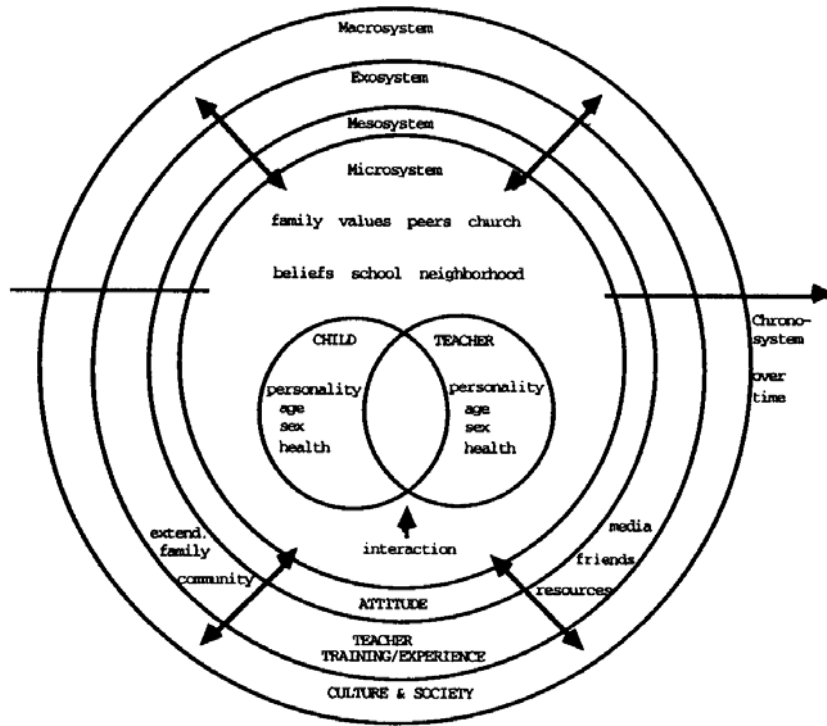


Figure A1  
Conceptual framework for study. Copyright 1998 From Teachers' Attitudes Toward Children of Drug Related Births by Lady Jane Hubbard. Reproduced by permission of Routledge/Taylor & Francis Books, Inc.

Appendix B  
Fetal Alcohol Syndrome Survey  
(Reproduced as Used)

SURVEY ON FETAL ALCOHOL SYNDROME

**INSTRUCTIONS**

Thank you for agreeing to complete this survey. I am seeking information from educators about their thoughts and experiences regarding alcohol use among their students and Fetal Alcohol Syndrome (FAS). Your response will remain anonymous and unidentifiable. Please respond to each item so that the best possible statistical results can be obtained. Please indicate your response by placing an X in the space provided next to the answer that best represents your own convictions. Do not put your name on this instrument.

Sample Question:

1. Fetal alcohol syndrome is diagnosable at birth.

AGREE  
 DISAGREE  
 DON'T KNOW

**This survey takes 10 minutes or less to complete. Please return your survey in the enclosed, stamped envelope. Thank you for your time and expertise.**

1. In your opinion, is it okay for a pregnant woman to have an occasional alcoholic beverage?

Yes       No       No opinion

2. What do you think is the most alcohol that a woman could drink during her pregnancy that would probably be safe for her developing baby?

0 drinks during her pregnancy  
 1 or 2 drinks during her pregnancy  
 3 or 4 drinks during her pregnancy  
 5 or more drinks during her pregnancy  
 Don't know

3. When do you think that a woman could drink during her pregnancy that would probably be safe for her developing baby?

Never during her pregnancy  
 During her first trimester  
 During her second trimester  
 During her third trimester  
 Don't know

4. In your opinion, is it okay for a nursing mother to have an occasional alcoholic beverage?

Yes

- No
- No opinion

5. Do you think it's her own business if a woman drinks alcoholic beverages during her pregnancy?

- Yes
- No
- No opinion

6. With the next five statements please indicate how likely it is that you would talk to a pregnant friend or relative about the effects of alcohol on a developing baby if:

	Highly likely	Likely	Unlikely	Highly unlikely	No opinion
a) Your friend or relative drank 1 or 2 alcoholic beverages during her entire pregnancy	_____	_____	_____	_____	_____
b) Your friend or relative drank 1 or 2 alcoholic beverages a month during her pregnancy	_____	_____	_____	_____	_____
c) Your friend or relative drank 1 or 2 alcoholic beverages a week during her pregnancy	_____	_____	_____	_____	_____
d) Your friend or relative drank 1 or 2 alcoholic beverages a day during her pregnancy.	_____	_____	_____	_____	_____
e) Your friend or relative drank 5 or more alcoholic beverages on any one occasion during her pregnancy.	_____	_____	_____	_____	_____

7. With the next five statements, please indicate how likely it is that you would talk to a pregnant friend or relative about seeking professional services to help her stop drinking if:

	Highly likely	Likely	Unlikely	Highly unlikely	No opinion
a) Your friend or relative drank 1 or 2 alcoholic beverages during her entire pregnancy	_____	_____	_____	_____	_____
b) Your friend or relative drank 1 or 2 alcoholic beverages a month during her pregnancy	_____	_____	_____	_____	_____
c) Your friend or relative drank 1 or 2 alcoholic beverages a week during her pregnancy	_____	_____	_____	_____	_____
d) Your friend or relative drank 1 or 2 alcoholic beverages a day during her pregnancy.	_____	_____	_____	_____	_____
e) Your friend or relative drank 5 or more alcoholic beverages on any one occasion during her pregnancy.	_____	_____	_____	_____	_____

8. How much do you know about the medical diagnosis called Fetal Alcohol Syndrome?

- I've never heard of FAS
- I've heard of FAS
- I know a little bit about FAS
- I know a lot about FAS

9. Please indicate how strongly you agree or disagree with the next six statements about Fetal Alcohol Syndrome (FAS):

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) People with FAS have a set of birth defects.	___	___	___	___	___
b) People with FAS have brain damage.	___	___	___	___	___
c) People with FAS have mental retardation.	___	___	___	___	___
d) People with FAS are affected physically.	___	___	___	___	___
e) People with FAS will outgrow these effects.	___	___	___	___	___
f) People with FAS have these effects throughout adulthood.	___	___	___	___	___

10. Please indicate how strongly you agree or disagree with the next five statements about the effects of FAS on a person's capabilities:

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) FAS affects a person's motor skills.	___	___	___	___	___
b) FAS affects a person's memory.	___	___	___	___	___
c) FAS affects a person's judgment.	___	___	___	___	___
d) FAS affects a person's ability to plan.	___	___	___	___	___
e) FAS affects a person's ability to learn.	___	___	___	___	___

11. Please indicate how strongly you agree or disagree with the next three statements about alcohol use and FAS:

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) Drinking alcohol during pregnancy can cause birth defects.	___	___	___	___	___
b) Currently, the only known cause of FAS is alcohol consumption by a birth mother during her pregnancy.	___	___	___	___	___
c) Fetal Alcohol Syndrome is preventable.	___	___	___	___	___

12. At what education levels are your current students? (Check all that apply)

- \_\_\_ Early development
- \_\_\_ Grades K-3
- \_\_\_ Grades 4-6
- \_\_\_ Grades 7-9
- \_\_\_ Grades 10-12

13. Of all your current students, what percent do you feel may have FAS themselves? \_\_\_\_\_%

14. Does a diagnosis of FAS qualify a child for Exceptional Student Services (ESE) in Florida?

- \_\_\_ Yes
- \_\_\_ No

\_\_\_Don't Know

15. Do you currently have any FAS screening or diagnostic services available in your school district?

\_\_Yes

\_\_No

\_\_\_Don't Know

16. Have you ever referred a student for an FAS screening or diagnosis?

\_\_\_Yes

\_\_\_No

17. Please indicate how strongly you agree or disagree with the following statements about working with your students:

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) I feel that I have the appropriate skills and knowledge to deal with alcohol abuse among my students.	___	___	___	___	___
b) I feel that I have the appropriate skills and knowledge to deal with students who have FAS.	___	___	___	___	___
c) I feel that I have the appropriate skills and knowledge to deal with the families of those students who have FAS.	___	___	___	___	___
d) I feel that I have the support of my administration to deal with students who have FAS and their families.	___	___	___	___	___
e) I have received training in the past year that was directed specifically at educational strategies for working with students who have FAS.	___	___	___	___	___
f) Currently, there are alternative resources or special education strategies in my classroom or at the school to help students who have FAS.	___	___	___	___	___
g) When these services are available, I encourage my students who have FAS To use the alternative resources or special strategies.	___	___	___	___	___

18. Please indicate how strongly you agree or disagree with the following statements about your role as an educator:

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) I feel that it is important for teachers to address alcohol abuse problems among students and their families.	___	___	___	___	___
b) I believe that a teacher can develop successful classroom interventions to help students who have FAS.	___	___	___	___	___

19. Please indicate how strongly you agree or disagree with the following statements regarding inclusion of children with developmental disabilities such as FAS in the regular classroom.

	<b>Strongly Agree</b>	<b>Somewhat Agree</b>	<b>Somewhat Disagree</b>	<b>Strongly Disagree</b>	<b>No Opinion</b>
a) Students with developmental disabilities such as FAS should be included in the regular classroom.	_____	_____	_____	_____	_____
b) Students with developmental disabilities such as FAS should have an Individual Education Plan (IEP) and receive Necessary ancillary services (mental health, social services, etc.)	_____	_____	_____	_____	_____

20. Do you have a special education endorsement? \_\_\_Yes \_\_\_No

21. Where is your main work location? (city or town) \_\_\_\_\_

22. What is your gender? \_\_\_Male \_\_\_Female

23. In what year were you born? \_\_\_\_\_

24. How many years have you been teaching? \_\_\_\_\_

25. How many years have you been teaching at your present location? \_\_\_\_\_

26. What is your highest educational degree? \_\_\_BA/BS \_\_\_MS/MEd. \_\_\_Ed.S. \_\_\_Doctoral

27. From which higher educational institution did you earn your professional degree?  
\_\_\_\_\_

28. Have you completed any formal coursework in alcohol or drug education as part of your professional teaching preparation?

\_\_\_Yes \_\_\_No

29. What kinds of support would be helpful to you in dealing with students who have FAS?

30. What expertise or strengths do you have for dealing with students who have FAS?

**YOUR COMMENTS AND SUGGESTIONS ARE IMPORTANT TO ME. PLEASE FEEL FREE TO WRITE ANYWHERE ON THIS QUESTIONNAIRE AND/OR CALL KAREN TURNER AT (850) 934-3043. YOU MAY ALSO SEND ME AN EMAIL AT**

**[kturner@uwf.edu](mailto:kturner@uwf.edu)**  
**THANK YOU AGAIN!**