

The Relationship Between Psychological Needs Satisfaction and Professional
Commitment of Minnesota School-Based Agricultural Education Teachers

A Dissertation

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Abstract

Teachers must be retained in the profession to meet the ever-growing demand for SBAE teachers across the United States. Although the literature has identified several factors which influence SBAE teacher retention, previous research has not examined the psychological needs satisfaction of Minnesota SBAE teachers. While critical to retention, professional commitment remains a needed area within SBAE research.

This study viewed psychological needs through the lens of SDT (Ryan & Deci, 2002), recognizing that the psychological needs of autonomy, competence, and relatedness are universal and innate needs essential for psychological functioning (Ryan & Deci, 2020). Given that people are drawn to environments that foster needs satisfaction and that needs satisfaction influences beliefs and behaviors (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016), teacher's psychological needs satisfaction influences a teacher's professional commitment. This study aimed to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness was related to and could predict SBAE teachers' professional commitment.

Hypothesized connections were tested simultaneously with a conceptual model where SBAE teacher's psychological needs satisfaction and professional commitment was examined. Overall, the results revealed that psychological needs satisfaction of autonomy, competence, and relatedness (independently and collectively) have a significant and negative impact on turnover intention, which was used to measure professional commitment. According to the data, competence and autonomy are the primary predictors of professional commitment. These results align with previous research on teachers that indicated autonomy (Collie et al., 2016) and competence

(Palmer, 2020) were indicators of professional commitment. It was concluded that satisfying SBAE teachers' psychological needs, especially the need for autonomy and competence, are an essential component of Minnesota SBAE teacher retention.

If leaders in SBAE want to reduce attrition, more must be done to support SBAE teacher's psychological needs satisfaction of autonomy, competence, and relatedness. Furthermore, special effort should be made to identify the distinctive needs of the majority of current SBAE teachers with up to ten years teaching experience, who tend to have lower psychological needs fulfillment.

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Chapter 1: Introduction

Teachers must remain in the profession to fulfill the ever-increasing need for school-based agricultural education (SBAE) teachers across the United States. To make this happen, teachers must feel a physical, mental, and emotional commitment to the work. As such, examining teachers' professional commitment is important because it influences both teacher attrition rates and teacher quality, as teachers' professional commitment is critical for delivering high-quality education. Specifically, this study explored the relationship between SBAE teachers' professional commitment and basic psychological needs satisfaction.

Basic psychological needs satisfaction of autonomy, competence, and relatedness have been shown to predict teachers' perceptions, namely their professional commitment (Baard et al., 2004; Collie et al., 2016; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014). According to the macro human motivation theory known as self-determination theory (Ryan & Deci, 2002), people have a natural inclination towards psychological growth and development, which results in increased capacity for learning, skill acquisition, and interpersonal connection. However, development and support are required for these human tendencies to be strong (Ryan & Deci, 2020). Self-determination theory (SDT) clarifies how people perceive their surroundings and contends that human motivational processes are supported by psychological needs satisfaction (Deci & Ryan, 2000).

The three psychological needs of autonomy, competence, and relatedness are essential to human development and motivation (Ryan & Deci, 2002, 2020). *Autonomy* "concerns a sense of initiative and ownership in one's actions" (Ryan & Deci, 2020, p. 1)

and is supported by experiences of interest a person sees of value and can fully endorse (Deci & Ryan, 2012; Ryan & Deci, 2020). *Competence* concerns a feeling of "mastery, a sense that one can succeed and grow," which is satisfied by "optimal challenges, positive feedback, and opportunities for growth" (Ryan & Deci, 2020, p. 1). *Relatedness* concerns a sense of "belonging and connection" (Ryan & Deci, 2020, p. 1) conveyed through mutual respect, reliance, and caring with other people and groups. SDT contends that when these three requirements are met, well-being is preserved and enhanced; otherwise, individuals will experience substantial psychological losses (Chirkov et al., 2003; Deci & Ryan, 2012; Ryan & Deci, 2020). The absence of any of these three fundamental needs is perceived to damage motivation and commitment.

When analyzing working environments specifically, workplace behaviors and outcomes are related to psychological needs satisfaction at work (Deci & Ryan, 2000; Van den Broeck et al., 2010, 2016). Teachers' perceptions, particularly their commitment to the profession and job satisfaction, are predicted by basic psychological needs satisfaction of autonomy, competence, and relatedness (Baard et al., 2004; Collie et al., 2016; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014; Nie et al., 2015). Furthermore, high attrition rates have been associated with poor psychological needs satisfaction (Albrecht & Marty, 2017). Researchers have recognized the satisfaction of teachers' basic psychological needs as being essential for job satisfaction and professional commitment (Lee & Nie, 2014) as the healthy human mind seeks out environments, including work environments, that satisfy psychological needs and gravitates toward them (Deci & Ryan, 2000, 2002; Greguras & Diefendorff, 2009; Van den Broeck et al., 2010, 2016).

Understanding why SBAE teachers are committed to the profession is key, given the connection between teacher psychological needs satisfaction and professional commitment (Lee & Nie, 2014). However, in education, to date limited research (Collie et al., 2016) had examined this relationship, and no researchers had specifically analyzed SBAE teacher psychological needs satisfaction of autonomy, competence, and relatedness and teacher professional commitment. Thus, the current study addressed the stated research need to examine if and to what extent psychological needs satisfaction was related to and could predict SBAE teachers' professional commitment (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016).

Need for the Study

An investigation of the factors that influence SBAE teachers' psychological needs satisfaction and professional commitment was needed to better support and retain teachers. Basic psychological needs fulfillment influences teachers' perceptions, notably their professional commitment and job satisfaction (Baard et al., 2004; Collie et al., 2016; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014). The theoretical concept of psychological need satisfaction has direct implications on teachers' professional commitment. Teachers' psychological needs must be fulfilled to stay in the profession. Researchers have identified basic psychological needs of teachers as being critical to job satisfaction and professional commitment (Lee & Nie, 2014). However, psychological needs fulfillment of SBAE teachers or the connection between those needs and teacher professional commitment were not previously explored. Given the link between psychological needs satisfaction and teacher professional commitment (Lee & Nie, 2014; Mabekoje et al., 2016), there was a need for this study.

While research has begun to examine the factors influencing professional commitment of SBAE teachers, further investigation is needed. Crutchfield and colleagues (2013) asserted that knowing factors that impact teacher professional commitment could assist in retaining SBAE teachers. Gorter (2018) also called for additional research concerning how professional commitment can be influenced and strengthened to increase SBAE teacher retention. Day (2008) argues the importance of pinpointing elements that sustain professional commitment. SBAE research has consistent themes about teachers needing to feel autonomous to make choices for their program, competent in their work, and supported through relationships with administration, community members, and other SBAE teachers. Research on teacher professional commitment (Collie et al., 2016; Klassen et al., 2012; Lee & Nie, 2014; Mabekoje et al., 2016) has posited that these needs for autonomy, competence, and relatedness can be explored by considering a teacher's psychological needs satisfaction. However, the psychological factors of these themes had yet to be examined in SBAE research, and there was a gap in the research considering if these factors, individually or collectively, can predict professional commitment.

The need for this study is timely as SBAE continues to experience a teacher shortage. Most of the annual teacher supply is made up of retained teachers, but significant attrition occurs with early-career SBAE teachers. Rada and Haddad (2021) examined Minnesota SBAE's supply and demand and found 54.5% of the 381 teachers who started their careers in Minnesota between 1998 and 2020 were still working in SBAE classrooms. The average annual percent attrition for Minnesota SBAE teachers (2.4%) is lower than the national (4.5%) SBAE attrition (Foster et al., 2020). Though

attrition is lower in Minnesota than the national average, most of the attrition occurs after completing one year or less. Within the first five years, more than one-third (34.1%) had left the SBAE profession. However, less than 5% left after completing five or more years (Rada & Haddad, 2021).

In Minnesota, a substantial number of the 2019-2020 SBAE teachers had fewer than five years of expertise. Thirty-three percent of those teachers had fewer than four years of SBAE teaching experience (Rada & Haddad, 2021). Given that a significant number of SBAE teachers in Minnesota have five or fewer years of experience and that early-career teachers tend to exit the profession at higher rates (Darling-Hammond & Sykes, 2003; Gray et al., 2015; Rada & Haddad, 2021), it was crucial to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment while also exploring potential factors unique to early-career teachers.

Statement of the Problem

Psychological functioning is expressed as a positive or negative state of mind resulting in higher levels of well-being, increased satisfaction with life, and fewer mental health problems (Mauss et al., 2011). Psychological functioning is the result of psychological needs satisfaction. Teachers' work-related perceptions influence their psychological functioning in the workplace (Collie et al., 2016).

By examining current teachers' perceptions of their satisfaction of basic psychological needs in their workplace, factors influencing SBAE teacher professional commitment could be investigated. The significance of teachers' perceptions of the fulfillment of their basic psychological needs of autonomy, competence, and relatedness

at work was highlighted by Collie et al. (2016). Palmer (2020) examined the relationship between teacher service years and basic psychological need fulfillment. A person's behavior is greatly influenced by the satisfaction of their innate psychological needs for autonomy, competence, and relatedness. Therefore, the central problem addressed in this study was to examine the psychological needs satisfaction of Minnesota SBAE teachers.

Purpose of the Study

The purpose of this study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict SBAE teachers' professional commitment. The following research questions guided the study:

RQ1: What is the perceived basic psychological need satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?

RQ2: What is the perceived professional commitment of Minnesota SBAE teachers?

RQ3: To what extent does psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) predict SBAE teacher professional commitment?

RQ4: To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?

RQ5: To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

Definition of Terms

The following is a list of terms defined operationally for the specific purposes of this study.

Alternative certification – “Alternative certification routes are nontraditional routes designed for individuals who have not completed a baccalaureate degree in education” (Ruhland & Bremer, 2002, p. 2). For the purposes of this research, Minnesota’s tiered licensure structure was recognized (see Appendix A). Teachers beginning their SBAE teaching career holding a Tier 1, Tier 2, or Out of Field permission license and had not received a baccalaureate or graduate degree in agricultural education were identified as alternatively certified.

Autonomy – “Autonomy concerns a sense of initiative and ownership in one's actions. It is supported by experiences of interest and value and undermined by experiences of being externally controlled, whether by rewards or punishments” (Ryan & Deci, 2020, p. 1).

Burnout – A psychological condition depicted by emotional exhaustion, depersonalization, and loss of sense of personal accomplishment (Maslach & Jackson, 1981).

Competence – “Competence concerns the feeling of mastery, a sense that one can succeed and grow. The need for competence is best satisfied within well-structured environments that afford optimal challenges, positive feedback, and opportunities for growth” (Ryan & Deci, 2020, p. 1).

Early-career teacher – Teachers with fewer than five years of teaching experience (Solomonson & Retallick, 2018).

Intrinsic motivation – "Doing an activity for the inherent satisfaction of the activity itself" (Ryan & Deci, 2000, p. 71).

Job-related Satisfaction – A person's "overall affective responses to their job" (Cammann et al., 1983, p. 80).

National FFA Organization (FFA) – An intracurricular student organization for students interested in agriculture and leadership development within school-based agricultural education (National FFA Organization, 2020).

Needs – The "organismic necessities for health" (Deci & Ryan, 2012, p. 87).

Professional commitment – A "belief in and acceptance of the goals and values of a profession, a willingness to work hard on behalf of the profession, and a strong desire to remain in a profession" (Bergmann et al., 2000, p. 17).

Psychological needs – "A subset of these necessities that are essential for psychological growth, integrity, and wellness" (Deci & Ryan, 2012, p. 87).

Relatedness – "Relatedness concerns a sense of belonging and connection. It is facilitated by conveyance of respect and caring" (Ryan & Deci, 2020, p. 1).

School-Based Agricultural Education (SBAE) – Systemic instruction in agriculture, food, and natural resources within a formal educational setting including elementary, middle school, and secondary levels (Phillips et al., 2008).

SBAE profession – SBAE teachers within their school, state, or nationally (Moser & McKim, 2020, p. 264-265).

SBAE teacher – Refers to teachers who teach and disseminate knowledge of agriculture, food, and natural resources for students from seventh grade through 12th grade (Phillips et al., 2008).

Self-Determination Theory – The assumption that “humans are inherently motivated to grow and achieve and will fully commit to and even engage in uninteresting tasks when their meaning and value is understood” (Stone et al., 2009, p. 77).

Teacher retention – Educators who remain in the teaching profession from year to year (Jacob et al., 2012).

Chapter 2: Literature Review

This chapter reviews the relevant literature focusing specifically on the factors of professional commitment, basic psychological needs satisfaction, and teacher retention. The first section defines factors influencing teacher professional commitment, summarizes factors that influence teacher professional commitment, and identifies relationships and gaps in the literature regarding professional commitment of SBAE teachers. The second section summarizes literature on basic psychological needs of autonomy, competence, and relatedness for psychological well-being. The second section also provides an overview of basic psychological needs and the influence of psychological needs satisfaction (i.e., the satisfaction of the need for autonomy, competence, and relatedness) on teachers. The third section establishes the relationship between teacher professional commitment and psychological needs satisfaction. The fourth section outlines factors impacting teacher retention, specifically SBAE teachers, as professional commitment is often evaluated using retention. Furthermore, basic psychological needs satisfaction influences professional commitment and retention. The final section elaborates on the theoretical framework for this study.

Professional Commitment

Commitment is an ongoing focus of career retention research. Committed professionals are presumed to have their needs met and be devoted to their careers (Blau, 1985). Blau (1985) outlined commitment as a general state of psychological attachment. Commitment has also been identified as a predictor of attrition (Day, 2008) and retention (Certo & Fox, 2002; Sammons et al., 2007); therefore, commitment could contribute to longevity within a profession. However, a variety of commitment terminology exists in

relation to work; often career, occupational, and professional commitment are used interchangeably in literature. For clarity within this study, SBAE teacher professional commitment describes an SBAE teacher's degree of psychological attachment to the SBAE profession resulting in a strong desire to remain in a profession.

Within the construct of work-related commitment, (a) organizational, (b) professional association commitment, and (c) professional commitment are described (Bergmann et al., 2000). *Organizational commitment* reflects a belief regarding the organization itself (Bergmann et al., 2000), describing the connection between the employee and the organization in which they work. Organizational commitment is defined as a psychological link and a sense of belonging, manifesting as pride about the organization and making it less likely the employee will voluntarily leave the organization (Allen & Meyer, 1996; Vandenberghe & Bentein, 2009). *Professional association commitment*, a second focus on work-related commitment, refers to employee union groups (Bergmann et al., 2000). *Professional commitment* focuses on the desire to remain in the profession. Professional commitment is a "belief in and acceptance of the goals and values of a profession, a willingness to work hard on behalf of the profession, and a strong desire to remain in a profession" (Bergmann et al., 2000, p. 17). Professional commitment is an "individual's attachment to their profession" (Giffords, 2009, p. 388) and explores the broad scope of the occupational field, while organizational commitment and professional association commitment focus on the local work environment.

Within an educational context, organizational commitment is the relative strength of an individual teacher's connection and commitment to a particular organization (e.g., school district), while professional association commitment would be the commitment to

a teacher's union or professional organization (e.g., National Association of Agricultural Educators, Minnesota Association of Agricultural Educators, Association for Career and Technical Educators, Minnesota Association for Career and Technical Educators).

Teacher commitment literature tends to focus on organizational and professional commitment (Firestone & Pennell, 1993; Lee & Nie, 2014; Ni, 2017; Park et al., 2020; Somech & Bogler, 2002). Though organizational and professional association commitment are often used in an educational context, these commitment lenses are not the focus of this research. This study focused on the broader context of commitment to the overall SBAE profession more so than the commitment to a local school district. Additionally, this study did not limit participation to those who are members of an SBAE professional organization. SBAE teacher professional commitment has been defined as the degree to which individuals identify with, value, and commit to remaining in the SBAE profession (Crutchfield et al., 2013; Gorter, 2018; McKim & Velez, 2015; Moser & McKim, 2020; Sorensen & McKim, 2014). Therefore, *SBAE teacher professional commitment* is described as the SBAE teacher's degree of psychological attachment to the SBAE profession and commitment to remain in the SBAE profession.

Teachers frequently refer to one another and themselves as being committed. However, even when focusing specifically on teacher professional commitment, Nias (1981) found that educators used the word commitment in four different senses – (a) "as caring," (b) "a concern for occupational competence," (c) 'personal identification as 'teacher,'" and (d) "career-continuance" (p. 181). For the purposes of this research, teacher professional commitment used the fourth sense, career-continuance, as professional commitment in this research was measured by turnover intention. Teacher

professional commitment is the consequence of a teacher's psychological attachment to their profession, motivation, willingness to learn, and belief that they make a difference in students' learning and achievement (Sammons et al., 2007). Such commitment to the profession is a primary reason teachers choose to remain in the profession (Certo & Fox, 2002). Still, questions remain about the psychological reasons influencing that choice to remain.

Factors which Influence SBAE Teacher Professional Commitment

Educational research has shown that teachers' professional commitment predicts turnover (Chapman, 1983; Raju & Srivastava, 1994; Singh & Billingsley, 1996) and has been described as a predictor of teachers' performance and burnout (Day et al., 2005; Louis, 1998; Tsui & Cheng, 1999). Additionally, teachers who are committed and resilient are more likely to be effective than others, and students whose teachers are committed are more likely to exceed academic expectations (Sammons et al., 2007). Sammons and colleagues (2007) conclude that maintaining and improving commitment and resilience is vital to teacher retention, but also state teachers at various stages of their careers require different types of assistance to maintain commitment.

SBAE research concurs that commitment is vital, and prior research suggested that SBAE teachers felt moderately to strongly committed to the SBAE profession (Crutchfield et al., 2013). Through limited research on the topic, SBAE teacher professional commitment had been conceptualized as the extent to which individuals identify with and value their profession and commit to staying in the SBAE profession (Crutchfield et al., 2013; Gorter, 2018; McKim & Velez, 2015; Moser & McKim, 2020; Sorensen & McKim, 2014). Understanding why SBAE teachers remain in the classroom

has been an important factor to explore when addressing the commitment to remain in the SBAE profession. Research has examined the factors influencing teachers to remain, the impact of years of teaching experience on SBAE teacher professional commitment, and teacher connections within the profession.

SBAE literature has discovered some factors which influence why teachers remain in the profession. Solomonson and colleagues (2021) identified the top three factors as “(1) the teacher’s ability to engage students, (2) the confidence level to adequately teach students, and (3) the confidence level to adequately teach the curriculum” (p. 132). When exploring the reasons SBAE teachers decide to stay in the profession, Igo and Perry (2019) found the strongest indicators were a good work-life balance, reliable contracts with competitive compensation, adequate training for the position, and positive student, school, and community connections. Overall, SBAE teachers who feel competent in the work they do, have connections, and are adequately compensated are more likely to remain in the profession.

Years of SBAE teaching experiences (Crutchfield et al., 2013) and teacher career stages (Solomonson et al., 2021) were correlated with professional commitment. However, researchers caution that commitment declines in later years, and beginning teachers are no less committed than teachers in the middle to latter stages of their professional careers (Crutchfield et al., 2013; Sammons et al., 2007). Solomonson et al. (2021) identified leading factors influencing Illinois SBAE teachers’ professional commitment varied based on the teacher’s career stage. Solomonson and colleagues (2021) discovered factors that are distinct to novice teachers versus experienced teachers

while assessing the variables influencing an SBAE teacher's decision to stay in the profession.

Significant differences related to professional commitment are influenced by a teacher's years of SBAE teaching experience. Mentoring and support from colleagues in their building are valuable to novice teachers, but late-career teachers are established and reported less need for mentorship (Solomonson et al., 2021). Previous research posited that mid-career teachers valued autonomy and the support they received from administration and the community (Solomonson & Retallick, 2018). Personal competence was significantly more important to early-career teachers than to mid-career teachers, which is consistent with Solomonson and Retallick's findings (2018). Early-career teachers reported concerns about their ability to competently teach their curriculum, whereas late-career teachers did not (Solomonson et al., 2021). The findings revealed discrepancies in potential mid-career leavers and stayers based on the level of recognition of competence they receive and issues with school policy and administration (Solomonson & Retallick, 2018).

Research has also analyzed how SBAE teachers' need for relatedness (i.e., sense of belonging) and connections influence professional commitment. Moser and McKim (2020) identified that SBAE teacher connections (i.e., curricular connectivity, SBAE teacher connectivity, school connectivity, and community connectivity) predicted 12% of the variance in professional commitment, with school connectivity and SBAE teacher connectivity being statistically significant. Overall, SBAE teachers need to feel connected to the curriculum, to SBAE peers, and to the school district.

Further research on SBAE teachers' professional commitment is needed. Crutchfield and colleagues (2013) suggested that understanding teacher professional commitment could help retain SBAE teachers. SBAE research indicates that teachers need to feel autonomous to make program decisions, competent in their work, and supported by administration, community members, and other SBAE teachers. Psychological needs satisfaction can be used to examine these needs for autonomy, competence, and relatedness in teacher professional commitment research (Collie et al., 2016; Klassen et al., 2012; Lee & Nie, 2014; Mabekoje et al., 2016). However, the psychological factors of these themes had yet to be examined in SBAE research, and there was a gap in the research considering if these factors, individually or collectively, can predict professional commitment. Thus, this study was designed to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment.

Teachers' Basic Psychological Needs Satisfaction

Satisfaction of the innate psychological needs of autonomy, competence, and relatedness is crucial in determining a person's behavior. These needs are natural and fundamental in fostering intrinsic motivation and are necessary for healthy psychological development and functioning (Deci & Ryan, 2012; Ryan & Deci, 2002, 2020; Ryan et al., 2019). Psychological health, motivation, and individual optimal functioning are strongly associated with the fulfillment of psychological needs (Chirkov et al., 2003; Colledani et al., 2018; Deci & Ryan, 2012; Mauss et al., 2011; Ryan & Deci, 2020).

Researchers determined that teachers' psychological functioning, or the fulfillment of basic psychological needs, is fundamental for job satisfaction and

professional commitment (Lee & Nie, 2014; Mabekoje et al., 2016). The fulfillment of an employee's needs for autonomy, competence, and relatedness at work has a direct positive relationship with well-being, job satisfaction, positive work-related attitudes, commitment, employee performance, and motivation (Baard et al., 2004; Deci et al., 2001; Gagné & Deci, 2005). Conversely, poor psychological functioning is linked with high attrition rates and burnout (Albrecht & Marty, 2017). The desire to satisfy a healthy person's basic psychological needs influences their behavior and drive to seek environments, including work environments, that support their need fulfillment (Deci & Ryan, 2000, 2014; Ryan & Deci, 2002; Vansteenkiste et al., 2020). Psychological functioning is central to teacher job satisfaction and commitment (Lee & Nie, 2014; Mabekoje et al., 2016). A teacher's work environment that supports need satisfaction is desirable as it promotes healthy psychological functioning and leads to commitment (Mabekoje et al., 2016). Needs satisfaction in the workplace significantly influences a teacher's motivation, choices, and behaviors to seek a work climate that fulfills basic psychological needs. Psychological needs satisfaction must fulfill the need for autonomy, competence, and relatedness.

Autonomy

Autonomy is the need for individuals to feel like they have voluntary control and choice over what they do. Autonomy references a sense of initiative, acceptance, and ownership in one's actions and is supported through experiences of interest and value instead of rewards or punishments (Deci & Ryan, 1985, 2000; Ryan & Deci, 2020). Autonomy "means acting with choice—which means we can be both autonomous and happily interdependent with others" (Pink, 2009, p. 88). People look for autonomy to

improve their lives as it increases an individual's persistence, results in higher productivity and less burnout, and promotes more significant levels of psychological well-being (Chirkov et al., 2003; Deci & Ryan, 2012; Pink, 2009). People are autonomous when their behavior is in harmony with genuine personal interests, values, and desires (Chirkov et al., 2003; Deci & Ryan, 1985, 1995, 2000). Autonomous people are also more willing to take initiative, act with intention, and stand behind their actions (Chirkov et al., 2003; deCharms, 1968).

Autonomy-supportive practices lay the foundation for teacher psychological need fulfillment. Autonomy has been found to be the strongest predictor of teacher psychological well-being (Collie et al., 2016; Deci et al., 2001; Nie et al., 2015; Taylor & Ntoumanis, 2007). Administrators establish the environments of the school and district, which affect the motivation, goals, and behaviors of the teachers (Collie et al., 2018; Deci et al., 1982; Nie et al., 2015; Pelletier et al., 2002). When teachers perceive their work environment as autonomy-supportive, they are more likely to feel basic psychological needs fulfillment (Collie et al., 2016; Klassen et al., 2012). Nie et al. (2015) found an autonomy-supported work environment was associated with teachers' high psychological wellness and intrinsic motivation to teach. However, the lack of autonomy support negatively impacted a teacher's motivation to continue in that school or the profession. Palmer (2020) assessed how psychological needs satisfaction correlated with teachers' years of service and determined teachers' perceived autonomy satisfaction and teacher years of service were not correlated. However, according to Bouwma-Gearhart (2010) and Palmer (2020), there is a deficit in the literature on the relationship between teacher autonomy and retention; therefore, additional research was needed to evaluate factors

beyond years of service to identify factors that may influence professional commitment and retention.

Autonomy has been studied, especially the relationship between the administration and SBAE teacher. Autonomy has been reported to influence mid-career SBAE teacher intention to remain in the profession (Clark et al., 2014; Solomonson & Retallick, 2018). Solomonson and Retallick (2018) identified factors influencing mid-career SBAE teachers' retention in the profession. Mid-career SBAE teachers value autonomy within the school district, which includes administrative and community support (Solomonson & Retallick, 2018). Clark et al. (2014) investigated the experiences of SBAE teachers who continued in the profession beyond reaching retirement age. The findings confirmed the idea that teachers who stayed in the profession longer were satisfied with the autonomy-supportive actions of their administration, which contributed to the longevity of their careers (Clark et al., 2014). However, existing research concentrated on mid- and late-career teachers, but there had been no research addressing the autonomy satisfaction of early-career teachers or a census of teachers. As the number of early-career teachers continues to grow, it is vital to understand how autonomy contributes to professional commitment throughout an SBAE teacher's career. This study aimed to add to the literature exploring SBAE teachers' satisfaction for the need of autonomy.

Competence

Competence relates to the "feeling of mastery, a sense that one can succeed and grow" within environments that provide "optimal challenges, positive feedback, and opportunities for growth" (Ryan & Deci, 2020, p. 101860). It recognizes the intrinsic

need to feel proficient in one's work. "The need for competence leads people to seek optimal challenges for their capacities and to persistently attempt to maintain and enhance those skills and capacities through activity" (Ryan & Deci, 2002, p. 7). Individuals have an intrinsic desire to achieve and grow, supporting basic needs satisfaction (Ryan & Deci, 2020). The innate drive, passion, and determination to stretch oneself, stick to it, and work towards competence results in satisfaction and commitment (Pink, 2009). Competence is not the attained skill or capability, but instead, the felt sense of confidence and mastery.

Competence is the psychological need for effectiveness and influences a person's psychological well-being. Wisniewski et al. (2018) described competence as an individual's need to feel effective in the world. Psychological frustration occurs in the workplace when there is a disparity between what people must do and what they can do. When duties exceed capabilities, anxiety results, but boredom is the consequence when responsibilities fall short of abilities (Pink, 2009). When developing competence or mastery, an individual must work to learn and grow, even when little progress is visible (Pink, 2009). When studying the context of teaching, perceived competence may influence a teacher's belief in their ability to be effective. A teacher's psychological needs fulfillment at work is influenced by perceived competence (Palmer, 2020). Collie et al. (2016) attested that competence was the best predictor of overall well-being and provided insight into understanding teachers' psychological functioning at work. A statistically significant relationship between teachers' perceived competence satisfaction and years of service has been documented (Hobson & Maxwell, 2017; Palmer, 2020). However, Palmer (2020) called for additional research to explore factors beyond years of service

that influence how teachers perceive competence, to identify the factors that foster motivated teachers who thrive and are retained.

Competence has not been thoroughly researched in SBAE literature. A gap existed in SBAE research evaluating overall teacher perception of competence satisfaction among SBAE teachers. SBAE research includes needs assessments based on SBAE teachers' high priority needs for training but has not examined the psychological aspect of felt mastery. The capabilities and deficiencies of SBAE teachers have been assessed through needs assessments, considering the competencies required to manage the discipline-specific expectations of an SBAE teacher (Clemons et al., 2018; Coleman et al., 2020; Smalley et al., 2019; Smalley & Smith, 2017; Sorensen et al., 2014). Discipline-specific teacher expectations encompassed in SBAE research include pedagogy, intra-curricular facilitation, program management, technical knowledge, professionalism, professional growth, and personal qualities (McKim et al., 2017; Roberts & Dyer, 2004). SBAE teachers who perceive higher competence within the discipline-specific teacher competence areas also reported a higher perceived commitment to teaching (McKim et al., 2017) and job satisfaction (Blackburn & Robinson, 2008). SBAE research has also focused on competence regarding online instruction during the COVID-19 pandemic (Eck et al., 2021) and multicultural competence (Vincent & Torres, 2015). Additional research assessed SBAE teachers' perceived competence regarding specific content, including agricultural mechanics (Byrd et al., 2015; Wells et al., 2021). However, a gap in the literature was found regarding overall perceived competence of SBAE teachers in relation to psychological functioning. Given that competence has been discovered to be a strong predictor of psychological

functioning at work (Collie et al., 2016), SBAE teachers' psychological need fulfillment of competence warrants deeper investigation.

Relatedness

The need to feel connected with others is an innate psychological need for humans. Also known as connection with others, relatedness is described as a sense of belonging and feeling connected to and cared for by others (Ryan & Deci, 2000, 2020) and is a vital component required for psychological functioning. Relatedness is satisfied when the person feels valued and appreciated by others (Meyer, 2014) and is essential for people's well-being and growth (Ronen & Mikulincer, 2014). Relatedness concerns the psychological sense to "connect with and be integral to and accepted by others" (Ryan & Deci, 2002, p. 7). Relatedness focuses on the feeling of being in a secure connection with others.

Relatedness need satisfaction in the work environment involves the human interaction necessary for self-determined motivation and is a strong predictor of work performance (Deci & Ryan, 2014). The social aspect of work must be incorporated when evaluating a teacher's sense of belonging. Relationships with students and colleagues influence the fulfillment of the basic need for relatedness for teachers (Klassen et al., 2012). Relatedness with colleagues was a predictor of commitment and early-career teacher psychological well-being, and relatedness with students was a crucial motivation for entering and staying in the teaching profession (Collie et al., 2016; Klassen et al., 2012). Relatedness with colleagues and students is essential; however, feeling connected to the community, school, and profession is also important. According to Palmer (2020), there was a deficit in the literature on the relationship between teacher relatedness

satisfaction and retention. Furthermore, prior research (Collie et al., 2016; Klassen et al., 2012) has concentrated on specific levels of teacher experience, but research addressing the relatedness satisfaction of a census of teachers is absent.

Relatedness is the psychological need most researched in SBAE teacher professional commitment literature. Moser and McKim posit that "connections and relationships are critical variables needing consideration in efforts to study and/or support SBAE teacher career commitment" (2020, p. 270). Moser and McKim (2020) evaluated SBAE teachers' perceptions of connectivity and career connection focusing on four connectivity elements: (a) curricular connectivity, (b) SBAE teacher connectivity, (c) school connectivity, and (d) community connectivity.

Curricular connectivity describes the level of knowledge and autonomy a teacher has of the curriculum (Moser & McKim, 2020). Existing research indicates that curricular connectivity is important, with more teacher autonomy and knowledge of the curriculum related to higher job satisfaction and intentions to stay in the classroom (Clemons & Lindner, 2019; Kauffman et al., 2002). As a result, teachers with greater control over their curriculum, passion, and preparation will perceive higher degrees of curricular connectivity. This aligns with the autonomy need satisfaction research.

SBAE teacher connectivity includes connections with "SBAE teachers within their school, state, or nationally" (Moser & McKim, 2020, P. 265) and was established as a significant, positive predictor of professional commitment. SBAE colleague support (Hasselquist et al., 2017; Moser & McKim, 2020) also significantly predicts SBAE teacher job satisfaction (Hasselquist et al., 2017; Moser & McKim, 2020). Respondents

indicated a reasonably strong connection with other SBAE teachers in contrast to school connections (Moser & McKim, 2020).

School connectivity evaluates the relationships with non-SBAE teachers and administration (Moser & McKim, 2020). Relatedness, or connectivity, within the school district (i.e., school connectivity) was identified to positively predict professional commitment (Moser & McKim, 2020). The strongest predictor of professional commitment was school connectivity; unfortunately, respondents felt the least connected in this area. School connectivity also significantly predicts SBAE teacher job satisfaction (Hasselquist et al., 2017; Moser & McKim, 2020).

Community connectivity measures the perception of connectedness with members of the teacher's community (Moser & McKim, 2020). SBAE provides numerous opportunities for teachers and the program to interact with the local community. However, community connectivity was statistically insignificant as a predictor of career commitment (Moser & McKim, 2020).

Connectivity within the curriculum, with other SBAE teachers, within the school, and within the community has been researched and connected with commitment (Hasselquist et al., 2017; Moser & McKim, 2020). However, SBAE literature has not examined if relatedness need satisfaction can predict professional commitment or how it correlates with overall SBAE teacher psychological needs satisfaction. This study added to the literature by further exploring psychological needs satisfaction for relatedness in the context of both the SBAE profession and their daily work environment within a school district.

Psychological Needs Satisfaction and Teacher Professional Commitment

A person's work environment provides unique opportunities for psychological needs satisfaction. The concept of psychological needs satisfaction for autonomy, competence, and relatedness describes the contextual factors that "support or undermine motivation, performance, and well-being" (Deci & Ryan, 2002, p. 27). This psychological support or suppression influenced behaviors and actions at work (Deci & Ryan, 2000). When psychological needs were satisfied, there was more effective functioning because "necessary nutriment for human growth and development" were supported (Baard, 2002, p. 259). Psychological needs satisfaction focuses on the nutrients essential for survival, growth, and integrity of the individual (Ryan et al., 1996), shifting the focus from getting the right person in a job to "presenting an environment for all employees in which they have the opportunity to get their intrinsic needs met and thus do well" (Deci & Ryan, 2002, p. 260).

The theoretical concept of psychological needs satisfaction has notable implications for teacher professional commitment. Humans gravitate towards environments that satisfy their basic needs (Deci & Ryan, 2002; Greguras & Diefendorff, 2009). Teachers' psychological need fulfillment is fundamental for professional commitment and fosters job satisfaction and well-being (Baard et al., 2004; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014). A teacher's work environment influences a teacher's basic psychological needs satisfaction, which motivates the actions and behaviors of the teacher.

Low psychological needs satisfaction is linked to high attrition rates and burnout (Albrecht & Marty, 2017; Bartholomew et al., 2014). Multiple studies within SBAE have

focused on teacher stress and burnout as contributors to the ongoing teacher shortage (Chenevey et al., 2008; Smith & Smalley, 2018). Lawver and Smith (2014) reported extreme stress levels in a study of SBAE teachers. Burnout is related to personal psychological exhaustion (Santoro, 2013). Burned-out teachers experience problems with emotional exhaustion (Bitsadze & Japaridze, 2014). Emotional exhaustion was the most damaging of the causes of overall teacher burnout (Yilmaz et al., 2015). Ultimately, the satisfaction of basic needs influences "life goals and daily behaviors" (Deci & Ryan, 2002, p. 27), and extreme stress and burnout result from unmet psychological needs and reduce professional commitment.

Satisfaction of the employee's psychological needs for competence, autonomy, and relatedness at work have a direct positive relationship with well-being, job satisfaction, positive work-related attitudes, employee performance, motivation, and commitment (Baard et al., 2004; Deci & Ryan, 2000; Deci et al., 2001; Gagné & Deci, 2005; Van den Broeck et al., 2010, 2016). The healthy human psyche strives for psychological needs satisfaction and gravitates toward environments that foster fulfillment (Deci & Ryan, 2002). Autonomy, competence, and relatedness fulfillment are fundamental for job satisfaction and professional commitment (Lee & Nie, 2014). Autonomy, competence, and relatedness need fulfillment improve commitment and retention of teachers (Collie et al., 2016; Lee & Nie, 2014). When examining the variables influencing professional commitment, it is evident that work environments either encourage or impede teacher psychological need satisfaction of autonomy, competence, and relatedness, which impacts a teacher's commitment to continue in the profession.

Teacher Retention

Teacher retention is widely explored and is used to assess professional commitment. On average, about 8% of teachers leave the profession annually, with about two-thirds departing before retirement age (National Center for Education Statistics, 2018; Sutchter et al., 2016). Beginning teachers have an even greater turnover rate than experienced teachers, with up to 8% of teachers leaving each year (Sutchter et al., 2016). Minnesota SBAE teacher attrition figures show that within their first five years of teaching, 34% of new teachers leave the profession within their first five years (Rada & Haddad, 2021), which aligns with national figures (Darling-Hammond & Sykes, 2003; Gray et al., 2015; Podolsky et al., 2016). Reducing attrition would lessen the projected shortages more than any other single factor (Sutchter et al., 2016).

The teacher retention literature identifies factors influencing a teacher's commitment to stay in the profession. The top five factors cited by teachers as influencing the decision to leave the teaching profession, other than retirement, were (a) childcare or pregnancy (37%), (b) the pursuit of another career (28%), (c) dissatisfaction with recent school accountability measures (25%), (d) dissatisfaction with the administration (21%), and (e) dissatisfaction with teaching as a career (21%) (Sutchter et al., 2016). More than half of teachers who left teaching indicated dissatisfaction with some part of their job as "very" or "extremely important" in their decision. In additional research, the decision to pursue a position other than a K-12 teaching position was the most frequently cited reason for teacher turnover, excluding retirement (National Center for Education Statistics, 2018). Teachers' psychological needs must be met to support job

satisfaction and professional commitment; however, literature on the underlying psychological causes of professional dissatisfaction is insufficient.

Recent literature has explored the lasting impact of the COVID-19 pandemic on teacher attrition. An EdWeek survey about teacher stress during the COVID-19 pandemic found "more than a quarter of teachers said job-related stress leads them to think often about quitting, and 16% said they dread going to work every day" (Will, 2021, para. 16). While difficult to know the long-term impacts of the pandemic on teacher attrition, in a January 2022 National Education Association survey, 90% of respondents indicated that feeling burned out is a serious problem, and up to 55% of educators indicated interest in leaving the profession earlier than planned (Jotkoff, 2022). High attrition rates and burnout are correlated with low psychological needs satisfaction (Albrecht & Marty, 2017), and job satisfaction and professional commitment necessitate autonomy, competence, and relatedness satisfaction (Lee & Nie, 2014). More research is needed to investigate the thoughts and feelings that lead to a shift in teachers' professional commitment. These psychological underpinnings require more investigation.

Minnesota SBAE Teacher Retention Programming

Teacher development and support are a priority in Minnesota. Mentorship and network building in Minnesota begin before a teacher joins their first classroom and long after the first year is complete. Professional development opportunities are available for postsecondary agricultural education students during the Midwest Regional Future Agriscience Teacher (FAST) Symposium (Rada, 2022). The Minnesota Teacher Induction Program (TIP), the primary professional development induction program for incoming Minnesota SBAE teachers, began in 1999 and has mentored more than 20

cohorts of new SBAE teachers in Minnesota (Greiman, 2010; Joerger, 2002; Joerger & Boettcher, 2000; Rada, 2022). Resources for Professional Learning (RPL) is a teacher retention program designed for early-career SBAE teachers in their second and third years of teaching, focusing on pedagogy, work-life balance, classroom management, and successful program management (Rada, 2022). The Minnesota Association of Agriculture Educators also offers professional development through two annual conferences and additional multi-day content-specific professional development workshops (Rada, 2022).

Minnesota SBAE teachers' annual attrition is also worth noting. Rada and Haddad (2021) discovered that 54.5% of the 381 teachers who began their careers in Minnesota between 1998 and 2020 were still teaching SBAE programs. Minnesota has a long history of providing induction support to early-career teachers (Greiman, 2010; Joerger, 2002; Joerger & Boettcher, 2000; Rada, 2022), which has contributed to Minnesota having a lower annual attrition rate for SBAE teachers (2.4%) than the national average (4.5%) (Foster et al., 2020; Rada & Haddad, 2021). It is worth noting that more than half of the teachers had fewer than 10 years of experience, so higher turnover in lower experience categories was expected. While the annual attrition rate is lower than the national average, losing 40% of teachers with less than 10 years of experience is concerning (Rada & Haddad, 2021). Furthermore, the loss of approximately one-third of teachers in years one through three is comparable to national averages but necessitates additional attention given the support systems available.

When evaluating SBAE teacher demand in Minnesota, it is apparent that there is a significant demand for SBAE teachers. Between 2005 and 2020, 27 school districts began

SBAE programs, and districts created 75 new SBAE teaching positions across the state (Sheehan, 2020). Because of the immense growth in demand for SBAE teachers in Minnesota since 2019 and the state's teacher retention rate each year (Sheehan, 2021), a substantial number of SBAE teachers have under five years of expertise. When examining the Minnesota SBAE teachers with 22 years or less of teaching experience, more than 33% had fewer than four years of SBAE teaching experience (Rada & Haddad, 2021). Given a significant number of SBAE teachers in Minnesota have five or fewer years of experience and early-career teachers tend to exit the profession at higher rates (Darling-Hammond & Sykes, 2003; Gray et al., 2015; Rada & Haddad, 2021), it was critical to analyze the factors that contribute to Minnesota's SBAE teachers' professional commitment.

However, Rada and Haddad (2021) did not investigate the traits of the teachers who continue to work in the field. The expected shortages would be reduced more by reducing attrition than by any other single cause (Sutcher et al., 2016). Therefore, it was necessary to conduct specific research assessing SBAE teachers' psychological needs fulfillment to explore the relationships between psychological needs satisfaction and commitment to the profession to explore why SBAE teachers continue to work in the field. As the director of the recruitment and retention programming in Minnesota SBAE, I have a background in supporting teachers and numerous experiences with teachers who stayed in the profession and with those who left. Those conversations and my personal experiences of leaving the SBAE teaching profession twice triggered the formation of this research.

Personal Experiences in SBAE Retention

My professional work involves supporting SBAE teachers daily, especially early-career SBAE teachers. I'm often asked why I left the SBAE profession during this work. It is a complicated question to answer. I usually summarize it as "I built a program I could no longer sustain alone and no longer had administration willing to support the growth by adding an additional teacher." While this response is accurate, the final decision to pursue a different role within SBAE wasn't a single trigger, and the final decision was significantly influenced by psychological factors. It was a conglomeration of several elements.

When I began teaching in Minnesota, I began midyear and was hired to build the part-time program back to full-time. Over nearly eight years, the SBAE program quadrupled from fewer than six courses a year to having preregistration resulting in more than 24 course offerings possible. Twenty FFA members grew to over 300 members. The administration who hired me trusted me to add relevant and rigorous courses, which included courses for science and college credit. Administration and community members trusted the choice to move to an affiliate membership structure for FFA and supported work-based learning requirements so all students could benefit from leadership development and career exploration. However, administration changed, and every choice began to be questioned. Advisory board members, alumni, and even current students advocated to the school administration for support of what I thought was needed to grow the program further. I met with the principal often enough that students even asked what trouble I was in. I no longer felt confident in the choices I was making and had little hope

that the growth I had been working towards would be actualized. I no longer had *autonomy* in my classroom or program.

Not only was I feeling micromanaged, but I also found myself being questioned about the content within my courses. The principal frequently stopped in for evaluations and asked students why we were learning the content. Additionally, students who didn't meet the prerequisites were being added to courses, so course content had to be continuously modified. My doubts during my first teaching job resurfaced even though I'd successfully grown the program over seven years. I was no longer confident in my abilities as a teacher. I no longer felt *competent* as a teacher.

When I began teaching in this district, a cohort of teachers began in the same timeframe. We connected easily, spent a lot of time reflecting and learning as early-career teachers together, and were friends beyond work. However, as life changed, each cohort member moved on to different districts, and I was the only one remaining. I no longer had daily support within the school district. Luckily, I did have support from other SBAE teachers. I felt no *relatedness* within the school district but did within the SBAE profession.

These factors, leveled up by personal challenges with infertility, adoption challenges, a tornado hitting our home, and an overall feeling of overwhelm coupled with an opportunity for change, resulted in my choice to pursue a different role within SBAE. Though my personal experiences are unique to me, the psychological factors and results were consistent both times I left teaching. I've also heard similar stories as I talk to other SBAE teachers working through the difficult choice of staying or leaving the profession. I often share during these conversations that I care more for the teacher as a human than

as a teacher in hopes of acknowledging the psychological factors impacting them. I have worked with SBAE and Career and Technical Education teacher induction and retention professional development programs for more than eight years. Throughout conversations with participating teachers, it is clear to me that administration changes, relationship changes, priority shifts, and so many other factors influence an SBAE teacher's psychological need satisfaction for autonomy, competence, and relatedness.

The decision to stay committed to the SBAE profession is often complicated and influenced by several factors. When I first read *Drive* by Daniel Pink (2009), it was validating to put words to all my thoughts about the various psychological factors that influenced my career changes and are still motivating SBAE teachers to stay or go. While I believe there are additional factors to explore regarding the motivational factors influencing SBAE professional commitment, *autonomy*, *competence*, and *relatedness* provide a solid foundation to launch this investigation.

Theoretical Framework

Deci and Ryan's (1985) self-determination theory (SDT) serves as the theoretical framework for this study. SDT is a macro human motivation theory that assumes natural, innate tendencies toward psychological growth and development exist in all individuals, leading to a more complex and unified sense of self (Ryan & Deci, 2002). Based on an organismic dialectical meta-theory, SDT assumes people are active organisms within an environment who strive to grow and integrate their experiences into a coherent sense of self (Deci & Ryan, 2000). People's innate growth tendencies and psychological needs require ongoing nutriment and support to function effectively. The foundations of SDT dwell in identifying the opposing forces between an individual's human nature and the

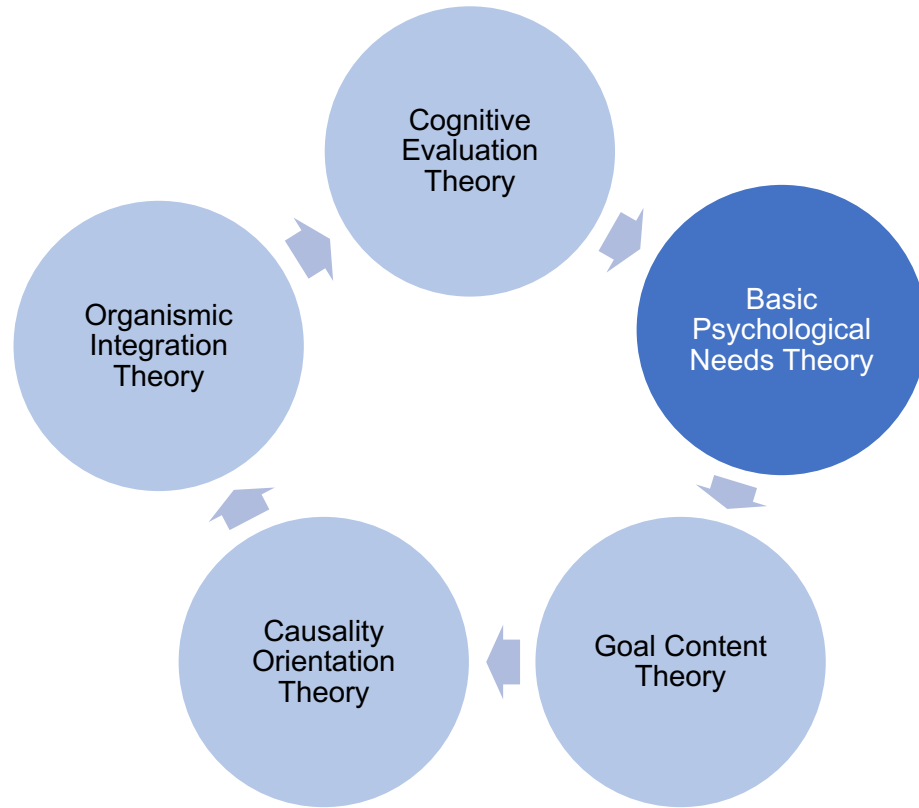
environment that either help or hinder development (Ryan & Deci, 2002). "SDT is concerned not only with the specific nature of positive developmental tendencies, but it also examines social environments that are antagonistic toward these tendencies" (Ryan & Deci, 2000, p. 69). Consequently, the interaction between the active organism and the social context was the basis for SDT's behavior, experience, and development predictions.

The foundational work developed a theoretical framework for conceptualizing and fostering the three basic psychological needs of autonomy, competence, and relatedness in the context of motivation (Deci & Ryan, 1985; Ryan & Deci, 2000). The SDT framework is used to determine what supports or undermines people's motivation, well-being, and performance quality. Conditions that support the psychological needs satisfaction of autonomy, competence, and relatedness enhance motivation, performance, and persistence. In this study, teacher perceptions are studied to determine if motivation and persistence in the teacher's career (i.e., professional commitment) are influenced by psychological needs satisfaction of autonomy, competence, and relatedness.

As a human motivation theory, SDT has evolved over the last 60 years and has been refined into five mini-theories (see Figure 2.1), which address different aspects of human motivation (Deci & Ryan, 2000; Ryan & Deci, 2017). Each of the five mini-theories was developed to explain a set of motivationally based phenomena that emerged from research (Deci & Ryan, 2000). For the purposes of this research, the basic psychological needs mini-theory provided the basis for the framework (Deci & Ryan, 2002).

Figure 2.1

Overview of Self-Determination Theory: The Five Mini-Theories



An overview of the five mini-theories within SDT is shown in Figure 2.1. Within the broader framework of SDT is a central mini-theory, basic psychological needs theory (BPNT), which focuses on the three basic psychological needs – the need for autonomy, competence, and relatedness. Basic psychological needs are broadly defined as a psychological nutriment essential for individuals' adjustment, well-being, integrity, and growth (Deci & Ryan, 1995, 2002, 2012; Ryan & Deci, 2002, 2020; Ryan et al., 2019). BPNT focuses on fundamental needs and the relation to psychological health and well-being when evaluating an environment. Three basic psychological needs provide the foundation for classifying features of an environment as supportive versus discouraging to psychological functioning (Ryan & Deci, 2002). Environments that satisfy the three

basic needs support healthy human functioning; however, when an environment does not meet fundamental needs, psychological needs frustration results, and healthy human functioning is hindered (Ryan & Deci, 2002; Vansteenkiste et al., 2020). Psychologically healthy humans strive for psychological needs satisfaction and gravitate toward environments that fulfill their needs when possible (Ryan & Deci, 2002). A social environment that supports an individual's needs for autonomy, competence, and relatedness is desirable as it promotes healthy psychological functioning.

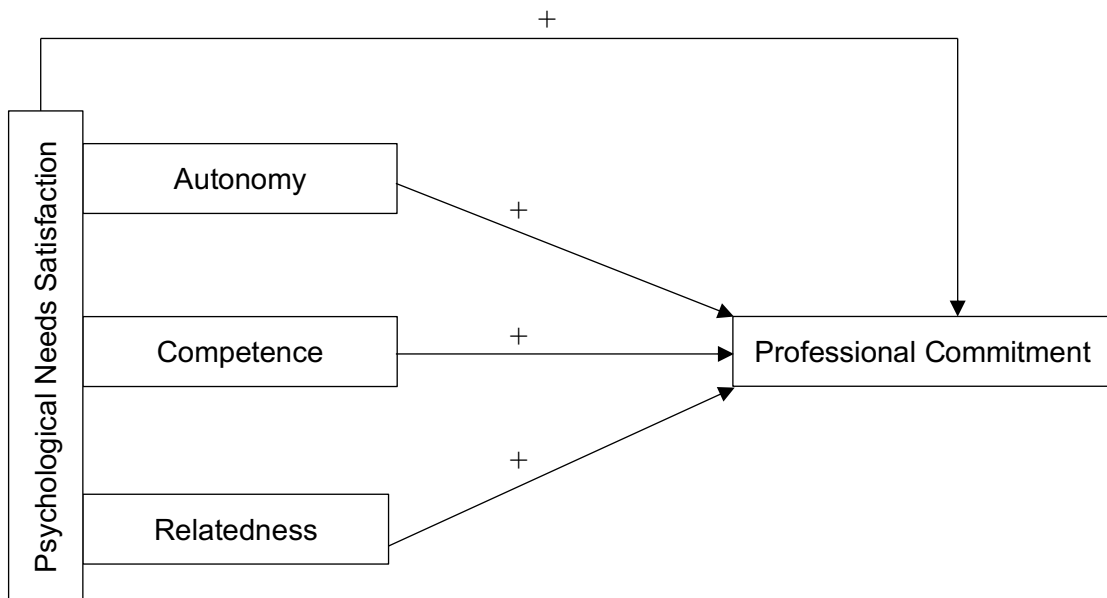
The psychological needs of autonomy, competence, and relatedness strongly affect human behavior and motivation. The three psychological needs play a prominent role in development, adjustment, and wellness, with substantial implications for basic motivational science (Ryan & Deci, 2017; Van den Broeck et al., 2016; Vansteenkiste et al., 2020). The concept of basic needs provided the basis for making predictions about conditions that promote optimal outcomes in personality development and the quality of behavior and experience within a specific situation (Deci & Ryan, 2000). SDT focuses on the motivation behind the behavior, as motivation is the reason that underlies behaviors and actions (Ryan et al., 1996). Humans are motivated to gravitate towards environments that promote needs satisfaction (Deci & Ryan, 2002).

Psychological needs satisfaction is an important characteristic to examine while studying teacher professional commitment behavior (i.e., the commitment to remain in the teaching environment). A hypothesized conceptual model of psychological needs satisfaction and professional commitment is shown in Figure 2.2. The model utilizes SDT to show how autonomy, competence, and relatedness individually and collectively influence professional commitment. The model depicts the hypothesized relationship,

with psychological needs positively influencing professional commitment. Professional commitment will improve if an SBAE teacher's psychological needs are being met. However, if a teacher's needs are not being met, professional commitment will be low.

Figure 2.2

Hypothesized Model of Psychological Needs Satisfaction and Professional Commitment



SDT is useful for examining individuals' beliefs and perceptions about their work environment. The satisfaction of people's intrinsic needs in the work environment influences job performance and satisfaction and plays a critical role in employees' decisions to remain in their respective professions (Baard et al., 2004). Researchers have determined that teachers' psychological functioning is fundamental for job satisfaction and professional commitment (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016). The relationship between psychological needs satisfaction and professional commitment has limited research (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016; Palmer, 2020). Furthermore, researchers had not examined the relationship

between psychological needs satisfaction and professional commitment with SBAE teachers.

Chapter Summary

This study viewed psychological needs through the lens of SDT (Ryan & Deci, 2002), recognizing that the psychological needs of autonomy, competence, and relatedness are universal and innate needs essential for psychological functioning (Ryan & Deci, 2020). Given that people are drawn to environments that foster needs satisfaction and that needs satisfaction influences beliefs and behaviors (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016), teacher's psychological needs satisfaction influences a teacher's professional commitment. This study aimed to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness was related to and could predict SBAE teachers' professional commitment.

Chapter 3: Methodology

Teachers must be retained in the profession to meet the ever-growing demand for SBAE teachers across the United States. Although the literature has identified several factors which influence SBAE teacher retention, previous research has not examined the psychological needs satisfaction of Minnesota SBAE teachers. While critical to retention, professional commitment remains a needed area within SBAE research. Chapter 3 highlights the general methodological approach and the detailed methods used to conduct this study.

Research Questions and Hypotheses

The purpose of this study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment. To accomplish this purpose, the following research questions were constructed:

RQ1: What is the perceived basic psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?

RQ2: What is the perceived professional commitment of Minnesota SBAE teachers?

RQ3: To what extent does psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) predict SBAE teacher professional commitment?

RQ4: To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?

RQ5: To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

The research addressed the following null hypotheses in the study:

H₀₁: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, psychological needs satisfaction of autonomy, competence, and relatedness collectively, and the response variable, SBAE teacher professional commitment.

H₀₂: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of autonomy, and the response variable, SBAE teacher professional commitment.

H₀₃: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of competence, and the response variable, SBAE teacher professional commitment.

H₀₄: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of relatedness, and the response variable, SBAE teacher professional commitment.

H₀₅: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher psychological needs satisfaction.

H₀₆: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher professional commitment.

Research Design and Methodology

This study utilized a quantitative, cross-sectional non-experimental methodology (Creswell & Creswell, 2018; Jackson, 2015). A census study analyzed the entire population (Johnson & Christensen, 2014) of Minnesota SBAE teachers engaged in the profession as of May 2022. This relationship was best investigated using a quantitative design to determine whether each independent variable predicted each dependent variable. Each participant rated their need satisfaction and professional commitment through an online questionnaire. A cross-sectional questionnaire was used to gather information from the SBAE teacher participants at one point in time (Creswell & Creswell, 2018; Stockemer, 2019).

Primary data were collected from individual SBAE teachers who met the inclusion criteria (i.e., were currently teaching in Minnesota as of May 2022) to address the research questions. The numeric description of trends and perceptions from the SBAE teacher sample was gathered using survey research (Creswell & Creswell, 2018).

Variables of Interest

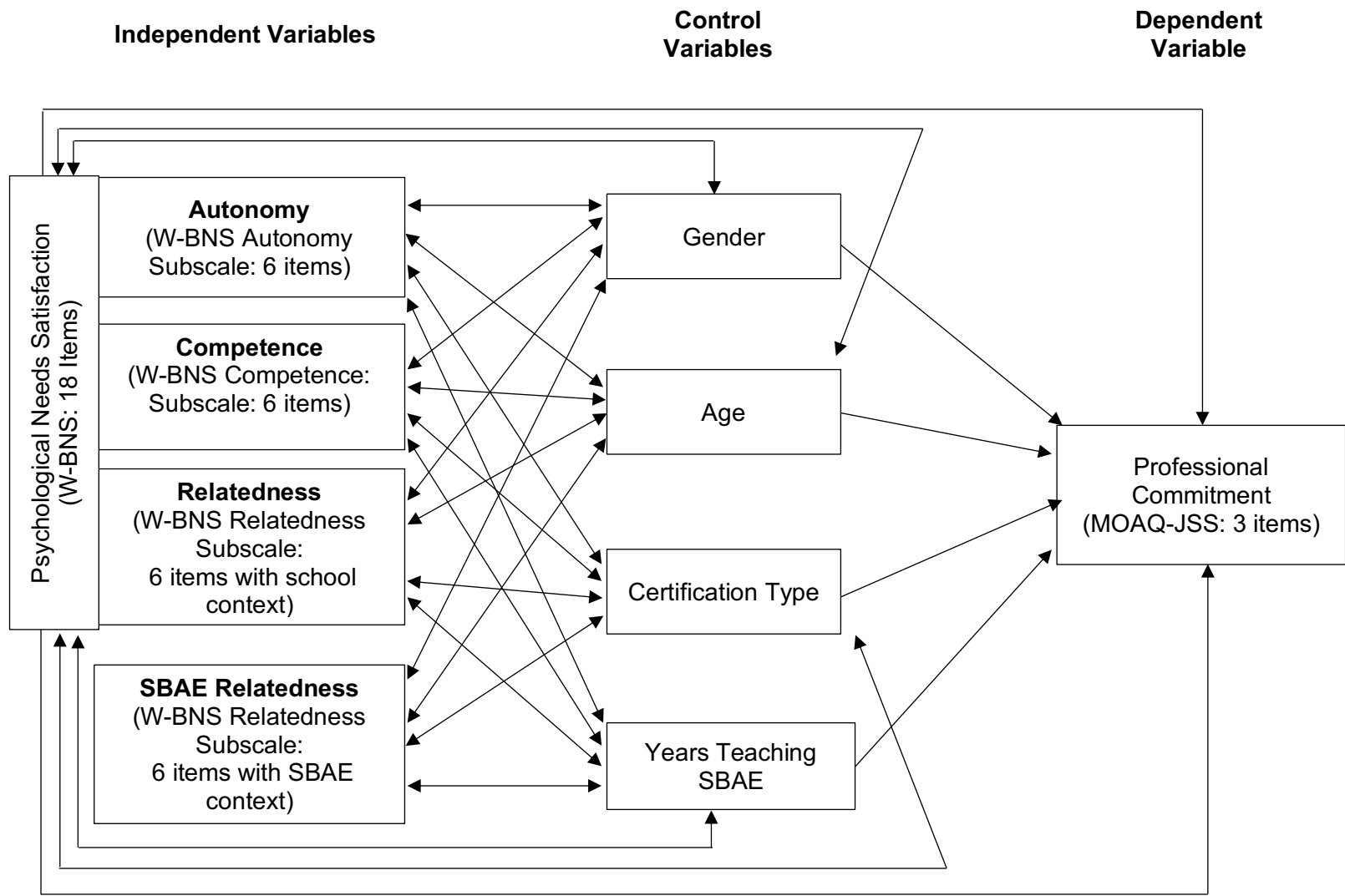
The hypothesized psychological functioning and professional commitment model depicts how autonomy, competence, and relatedness individually and collectively positively influence professional commitment (see Figure 2.2). Professional commitment would improve if an SBAE teacher's psychological requirements were fulfilled. Professional commitment would be diminished if a teacher's needs were not fulfilled.

Independent variables are a variable presumed to cause a change in another variable (Johnson & Christensen, 2014). As shown in Figure 2.2, the independent variables in this research were autonomy, competence, relatedness in the school district, relatedness in the SBAE profession, and psychological needs satisfaction. I measured the dependent variable, which is assumed to be influenced by one or more of the independent variables (Jackson, 2015; Johnson & Christensen, 2014). In this case, the dependent variable is professional commitment measured by turnover intention.

Control variables influence the understanding of relationships between independent and dependent variables. Prior research had considered control variables such as age, marital status, gender, certification type, and years teaching SBAE. To analyze the influence of independent variables on the dependent variable, hierarchical regression analysis was used to manage control variables that may potentially impact the dependent variable (Creswell & Creswell, 2018). Researchers within SBAE teacher retention have debated a variety of variables, with conflicting results about the relationship of each control variable to professional commitment (Blackburn & Robinson, 2008; Boone & Boone, 2007; Chaney, 2007; Clark et al., 2014; Crutchfield et al., 2013; Lemons et al., 2015; McKim & Velez, 2015; Murray et al., 2011; Solomonson et al., 2018; Sorensen et al., 2016a, 2016b; Tippens et al., 2013; Touchstone, 2015; Wheeler & Knobloch, 2006). Given prior research on SBAE teacher professional commitment, I selected age, gender, certification type, and years teaching SBAE as control variables (see Figure 3.1).

Figure 3.1

The Hypothesized Model of Psychological Functioning and Professional Commitment with Instruments Summarized



The psychological functioning and professional commitment model (see Figure 3.1) illustrates the hypothesized relationship in which psychological needs influence professional commitment positively. Relatedness is also addressed in two contexts: relatedness in a school district and relatedness in the SBAE profession. Additional demographic data, such as gender, age, certification type, and years teaching SBAE, were recorded as control variables. Professional commitment would improve if an SBAE teacher's psychological requirements were fulfilled. Professional commitment would be diminished if a teacher's psychological needs were not fulfilled.

Instrumentation

An online questionnaire was designed to collect numerical data. Participants rated statements regarding their psychological needs satisfaction and professional commitment using matrix table questions, numerical continuous questions, and multiple-choice questions. The matrix table questions used Likert scales with multiple items with the same response choices (Stockemer, 2019). A Likert scale is frequently used in questionnaires to measure attitudes or perceptions (Stockemer, 2019). All members of the population were invited to participate, all variables were designed to collect continuous data, and each teacher could only submit one response to ensure each teacher participant's response was equally represented in the census (Schober et al., 2018).

The questionnaire consisted of 27-items, comprised of two existing instruments: the Work-related Basic Need Satisfaction Scale (Van den Broeck et al., 2010), which assessed the psychological needs satisfaction, and the Michigan Organizational Assessment Questionnaire (MOAQ) Job Satisfaction Subscale (Cammann et al., 1983), which assessed professional commitment of SBAE teachers. The Work-related Basic

Need Satisfaction Scale (W-BNS) and MOAQ Job Satisfaction Subscale (MOAQ-JSS) were selected to determine if and to what extent a relationship existed between psychological needs satisfaction and teachers' professional commitment.

The original instruments used in this study were updated to clarify teaching as the job or task being completed. Following a consultation with the author of W-BNS (Van den Broeck, personal communication, October 20, 2020), it was deemed appropriate to duplicate the relatedness satisfaction subscale to provide two contexts – school district and SBAE profession. To provide focus and clear directions, participants saw one section at a time to ensure each section or subscale was considered at its merit.

The first section of the online questionnaire asked respondents to identify to what extent their current school district fulfilled their basic psychological needs. The W-BNS (Van den Broeck et al., 2010) was utilized to measure the need satisfaction for autonomy, competence, and relatedness of Minnesota SBAE teachers. The scale (see Appendix I) consisted of 18 items representing three subscales—autonomy satisfaction, competence satisfaction, and relatedness satisfaction. Six questions measured each subscale (e.g., "I feel free to do my job the way I think it could best be done"). All items were measured on a scale from *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5). The W-BNS was scored by summing all items in aggregate and computing a mean score; subscale scores were calculated similarly. Reverse scoring was used for eight items on this instrument.

The W-BNS Autonomy Satisfaction subscale (Van den Broeck et al., 2010) had six items, three of which were reverse scored. The W-BNS Competence Satisfaction subscale (Van den Broeck et al., 2010) had six items, two of which were reverse scored.

The final component of section one was the W-BNS Relatedness Subscale consisting of six items, three of which were reverse scored. The component focused on the teacher's job in their current school district while considering relatedness fulfillment. Permission was granted from the authors to use the instruments for this study on October 20, 2020 (see Appendix B).

The second section asked respondents to identify to what extent their experiences within the SBAE profession satisfied their need for relatedness. After consulting with the author of W-BNS (Van den Broeck, personal communication, October 20, 2020), it was decided to duplicate the W-BNS Relatedness Subscale from the first instrument with directions clarifying the SBAE context to provide additional context about relatedness fulfillment within the SBAE profession. Contextualized SBAE statements measured relatedness satisfaction specifically in SBAE (e.g., "Some colleagues in the SBAE profession are close friends of mine"). The scale consisted of six statements (e.g., "I feel I am a part of the SBAE profession"). All items were measured on a scale from *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5).

The third section asked respondents to identify the extent to which they are committed to the SBAE profession using the second instrument, the MOAQ-JSS. The dependent variable, professional commitment, is a continuous variable with a subscale developed using a validated instrument, MOAQ-JSS, which measures turnover intention. Within SBAE, professional commitment has been conceptualized as the extent to which individuals identify with and value the profession and commit to staying in the SBAE profession (Crutchfield et al., 2013; Gorter, 2018; McKim & Velez, 2015; Sorensen &

McKim, 2014). Intention to turnover is a predictor of actual turnover (Blau, 1985, 1988; Blau & Boal, 1987); therefore, professional commitment was measured through intention to turnover. The three items in the MOAQ-JSS measured the individual's intention to continue with their current employment (Cammann et al., 1983). Respondents selected from a 7-point Likert scale consisting of the following responses: *strongly disagree* (1), *disagree* (2), *slightly disagree* (3), *neither agree nor disagree* (4), *slightly agree* (5), *agree* (6), and *strongly agree* (7). A respondent scale score between 1 and 2 was interpreted as low turnover intention, 3 and 5 as neutral turnover intention, and 6 and 7 as high turnover intention. Permission was granted from the authors to use the instruments for this study on October 18, 2020 (see Appendix B).

Instrument Validity

Validation is a continuous process involving the accumulation of evidence based on several sources to provide a sound basis for interpreting scores (Johnson & Christensen, 2014). Johnson and Christensen (2014) refer to validity as "the accuracy of the inferences or interpretations you make from the test scores" (p. 239). When using an existing instrument, the researcher must describe the established validity of scores obtained from past use to identify whether an instrument is an appropriate fit for the present research (Creswell and Creswell, 2018). The instrument and subscales included two validated instruments, the W-BNS and MOAQ-JSS, chosen to measure the psychological needs satisfaction and professional commitment using Likert scale responses.

Content validity ensures a concept is adequately being measured for each subscale by assessing the correspondence of the items included in the summated scale and its

conceptual definition (Hair et al., 2014). Face validity addresses whether the instrument “looks valid on its surface” (Jackson, 2015, p. 70). A panel of experts ($n = 7$) made up of SBAE professors, instrument authors, and scholars from the University of Minnesota (see Appendix D) examined the 27-item online questionnaire for face and content validity. The panelists were chosen because of their research expertise related to psychological functioning of teachers and/or teacher retention. Each panelist received an email (see Appendix E) outlining the study’s goals and expectations of them as expert reviewers. The email also included a document of the questionnaire. Experts were asked to provide input on the directions, questions, and statements directly within the document, then submit feedback to me. Content and face validity were established by the panel reviewing items. Feedback received from the panel was compiled and reviewed. As a result of the recommendations by expert panel members, the original directions were adjusted to focus on current SBAE teacher perceptions instead of reflecting on five years. The original W-BNS scale was developed in Dutch which translated to be measured on a scale from *totally disagree* (1), *disagree* (2), *somewhat disagree/somewhat agree* (3), *agree* (4), and *totally agree* (5). Based on the feedback from the expert panel members, the translation of the W-BNS scale was adjusted to a scale from *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5). A question regarding certification type was also added. Several items were edited for clarity resulting in a pilot test instrument.

Pilot Test

In survey research, pretesting the data collection tool is typically seen as a crucial step. Pilot testing establishes content validity, determines how long the study will take,

and ensures instructions for the instrument are clear (Creswell & Creswell, 2018). In this case, a group of SBAE teachers from outside Minnesota who were not participating in the study were recruited to form a pilot group. A random sample of 62 Missouri SBAE teachers and all 115 South Dakota SBAE teachers were invited to participate. These states were selected due to the similar SBAE structure and Midwest geographical location. A minimum of 20 participants were sought to participate (DeVellis, 2017), with 50 SBAE teachers completing the pilot questionnaire, administered online through Qualtrics via an email invitation (see Appendix F). The pilot test (see Appendix G) also screened items for appropriateness, validity, and internal consistency (Hair et al., 2014). Based on the pilot results, the items with reverse scoring were inversed to report the responses provided correctly. Demographic information and career experiences were moved to the end of the questionnaire based on pilot test responses.

Instrument Reliability

The instrument's reliability and the reliability of each summated scale were analyzed to ensure acceptability for the study. Each summated scale and subscale were analyzed to assess the degree of consistency or stability between multiple measurements of a variable (Hair et al., 2014; Johnson & Christensen, 2014). The reliability coefficient assessed the consistency of the entire scale and each subscale using Cronbach's alpha (α). Acceptable Cronbach alpha values are at or above .70 (Hair et al., 2014; Johnson & Christensen, 2014). Table 3.4 compares the reliability of the W-BNS and MOAQ-JSS from original instruments and the current study, outlining the Cronbach's Alpha coefficient for each instrument.

Table 3.1

Comparison of Reliability of the Work-Related Basic Need Satisfaction and MOAQ Job Satisfaction Scales from Original Scale and Current Study

Construct	Original Instrument*	Post-hoc Reliability (<i>n</i> = 50)
	<i>r</i>	<i>r</i>
W-BNS – Autonomy Subscale ^a	.81	.77
W-BNS – Competence Subscale ^a	.85	.80
W-BNS – Relatedness Subscale ^a	.82	.87
W-BNS – SBAE Relatedness Subscale ^a	.82	.89
MOAQ-JSS ^b	.83	.89

**Note.* ^aWork-related Basic Need Satisfaction Scale (Van den Broeck et al., 2010).

^bMOAQ Job Satisfaction Subscale (Cammann et al., 1983)

As shown in Table 3.4, the resulting Cronbach alpha coefficients demonstrated acceptable reliability for the autonomy satisfaction, competence satisfaction, relatedness satisfaction in their school district, and relatedness satisfaction within the SBAE profession. These findings are consistent with the psychometric properties found by Van den Broeck et al. (2010). The Cronbach alpha supports that each of the W-BNS subscales is unidimensional in calculating the satisfaction of autonomy, competence, and relatedness. Additionally, the entire instrument is unidimensional in measuring the overall psychological needs satisfaction. The Cronbach alpha also demonstrated acceptable reliability for overall psychological needs satisfaction. The MOAQ-JSS (Cammann et al., 1983) scale had acceptable internal consistency reliability. Similar

findings of reliability (.84) were reported by Konovsky and Cropanzano (1991) and Shore et al. (1990).

Population

This study's population was Minnesota SBAE teachers actively teaching as of May 2022 ($N = 316$). Minnesota SBAE teachers were selected for this census study for three primary reasons: Minnesota's professional development focus on retention, Minnesota's lower than average attrition rate, and Minnesota's significant program growth.

All teachers listed on the 2021-2022 Minnesota SBAE teacher directory and engaged in the profession as of May 2022 received an invitation to complete the questionnaire. The directory was available from the Minnesota FFA Association; as the State FFA Staff member who maintained the annual directory, I had immediate access. A potential benefit to this study was that all Minnesota SBAE teachers knew and had worked with me because of my state staff role and may have been more willing to participate, resulting in a higher response rate. However, due to my position with Minnesota FFA and the state's teacher induction and retention programming, there was a potential for response bias.

Demographic data were collected to provide a descriptive overview of the participants. There were 181 SBAE teacher participants who provided complete data ($n = 181$; 57.3% response rate); 72 were male (39.8%), and 108 were female (59.7%). Table 3.1 compares the demographics of Minnesota SBAE teacher respondents to overall Minnesota (Sheehan, 2021) and National SBAE teacher populations of Agricultural Experience Tracker (AET) users (AET, 2022). Minnesota SBAE teachers were

predominately female. In comparison, female respondents were overrepresented in the sample of respondents.

Table 3.2

Demographics of Minnesota SBAE Teacher Respondents versus total Minnesota and Nationwide SBAE Teacher Population

Gender	Minnesota SBAE Teacher Respondents (<i>n</i> = 181)		Minnesota SBAE Teachers (Sheehan, 2021) (<i>n</i> = 312)		Nationwide SBAE Teachers (AET, 2022) (<i>n</i> = 14,228)	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Male	72	39.8	143	45.8	6516	45.8
Female	108	59.7	169	54.2	7712	54.2
Prefer not to say	1	.6				

Minnesota SBAE teachers averaged 38 years of age (*SD* = 12.72) with a range of 54 years varying from 22 to 76 years of age. Age of Minnesota SBAE teacher respondents in 2022 was calculated using the data collected to allow for comparison to the Minnesota Department of Education (MDE) data, as shown in Table 3.2. In comparison, the SBAE teacher responders closely matched the general percentage of teachers aged 26-40 and 51-60. Participants aged 25 to 40 and 41 to 50 were underrepresented, whereas those aged 61 and up were overrepresented in the sample of respondents. Altogether, two-thirds (61.3%) are under the age of 40.

Table 3.3*Age of Minnesota SBAE Teacher Respondents (n = 181)*

Age	Minnesota SBAE Teacher Respondents (n = 181)		Minnesota SBAE Teachers (n = 312; Sheehan, 2022)	
	f	%	f	%
18 – 25	39	21.5	85	27.2
26 – 30	27	14.9	46	14.7
31 – 40	45	24.9	77	24.7
41 – 50	25	13.8	57	18.3
51 – 60	20	11.0	32	10.3
61 – 70	14	7.7	15	4.8*
70 – 80	1	.6		

* MDE data report only those age 61 and older as one sum

The certification type of Minnesota SBAE teacher participants was also analyzed (see Appendix A). Most participants ($n = 160$, 88.4%) have an agricultural education undergraduate and/or graduate degree, which led to full licensure (Tier 3 or 4). Minnesota’s remaining SBAE teacher participants ($n = 21$, 11.6%) have obtained licensure through alternative means (Tier 1, Tier 2, or out of field permission). Of the 181 respondents, over 65% reported having an agricultural education undergraduate degree ($n = 118$), over 8% ($n = 15$) have an agricultural education graduate degree, and an additional 27 respondents (14.9%) have both an undergraduate and graduate agricultural education degree. In 2021, Sheehan (2021) reported that 43 (13.8%) Minnesota SBAE teachers were teaching without an undergraduate or graduate agricultural education degree. Therefore, the alternatively licensed respondents were slightly overrepresented in the sample of respondents.

Regarding number of years teaching SBAE, Minnesota teacher participants had an average of 12.36 years ($SD = 11.08$) of SBAE teaching experience ranging from less than one year to 51 years (see Table 3.3). In terms of specific years of experience, 20

SBAE teachers reported having taught for one year or less (11%), 20 had taught for two years (11%), and 15 had taught for three years (8.3%). Fewer than ten teachers were reported for each remaining year, with the exception of the 12 teachers who have taught seven years (6.6%). Altogether, the comparison of data provides a foundation that two-fifths (39.2%) of Minnesota’s SBAE teacher respondents have fewer than five years of teaching experience, and more than half (56.3%) have less than 10 years of teaching experience (see Table 4.3). This aligns with the 2021 report that one-third (33.7%; $n = 105$) of Minnesota SBAE teachers had fewer than three years teaching experience (Sheehan, 2021). Participants had an average of 12.36 years ($SD = 11.08$) of SBAE teaching experience. Additionally, one-third of the responding Minnesota SBAE teachers are under the age of 30, and more than half have less than 10 years of teaching experience.

Table 3.4

Years Teaching SBAE of Minnesota Teacher Participants

Years Teaching SBAE	<i>f</i>	%
0-5	71	39.2
6-10	31	17.1
11-20	40	22.1
21-30	23	12.7
31-40	13	7.2
41-50	2	1.1
More than 50	1	.6

Data Collection

The *Dillman Tailored Design Method* (Dillman et al., 2014) was utilized to guide the data collection process. Each contact to respondents was personalized, with at most four contacts made to encourage participation. The message, time, and day of the week in

which the messages were delivered varied for each contact, and messages were sent from an email on the teachers' safe list. I am a state staff in Minnesota and am on the recommended list of safe contacts SBAE teachers are provided annually to ensure communications are received from the state office. Each respondent was assigned a unique ID number.

A non-experimental questionnaire was selected to collect perceptions from a large population at a single point in time (Creswell & Creswell, 2018). A customized cover letter (see Appendix H) and online Qualtrics questionnaire (see Appendix I) were emailed in May 2022 to the population frame for the census. Teachers currently teaching in the SBAE profession in Minnesota as of May 2022 were the participants of this research.

Each teacher was assigned a randomized code, and teacher completion was tracked. Qualtrics collected quantitative data using an online questionnaire, stored the data on web servers which were accessible only by password, and provided a downloadable file for data analysis. This allowed for the tracking of respondents, ensured the integrity of survey data, and prevented duplicated submissions (Dillman et al., 2014). All data were de-identified by removing personal information to protect participants' privacy. The informed consent notified participants of eligibility requirements and exited participants from the online questionnaire who did not meet the participation requirements. Aggregate results were offered to participants for their participation. Full data confidentially was maintained as participant codes were kept separate from the data and stored only on the University of Minnesota's secure network.

Participant fatigue was mitigated by grouping items to reduce the number of pages needed to navigate. The questionnaire consisted of 27 validated items from two

instruments and 22 demographic responses estimated to take 10 minutes to respond based on pilot test results. This questionnaire length was appropriate as Revilla and Ochoa (2017) concluded that the ideal length is a media of 10 minutes. A significant decline in responses occurs when 20 minutes or more are needed to complete (Dillman et al., 2014; Galesic & Bosnjak, 2009; Revilla & Ochoa, 2017). Response options were limited to five or seven balanced categories to improve reliability, validity, and provide meaningful distinctions for analysis (Dillman et al., 2014). The questionnaire was tested on a computer and smartphone to verify it was mobile-friendly. Radio buttons were used to ensure it could be completed on either a computer or smartphone (Dillman et al., 2014). The questionnaire remained active for four weeks, with email reminders sent to non-responders on weeks two (see Appendix J), three (see Appendix K), and four (see Appendix L) to generate a greater response rate (Dillman et al., 2014).

Nonresponse Error

Four potential forms of error exist in survey research: sampling error, coverage error, measurement error, and nonresponse error (Dillman et al., 2014). When these sources of error accumulate, the survey research's findings and recommendations become problematic. It can be inaccurate to base a study solely on information from those who replied, and it is debatable whether respondents accurately reflected perspectives of the overall population (Miller & Smith, 1983). Nonresponse error has received the least attention of the four categories; however, methods have been developed to control nonresponse error (Lindner et al., 2001). Researchers have used various strategies to account for nonresponse error, including comparing respondents to the population,

nonrespondents, early and late responders, and "double-dipping" nonrespondents (Miller & Smith, 1983).

By examining responses from late respondents, one can assess the nature of the responses of nonrespondents (Miller & Smith, 1983). As such, I divided the respondents into two categories: those who responded early and those who responded late. Late respondents were identified based on when they responded to a stimulus of an email reminder (Lindner et al., 2001). A minimum recommendation of 30 late respondents was identified based on responses generated by a stimulus of an email reminder to nonrespondents (Lindner et al., 2001). Recommendations of identifying late respondents as those that responded to the last stimulus resulted in 24 responses being identified as late. To meet the recommendation of 30 respondents (Lindner et al., 2001), any responses after the final two reminder emails were sent were considered late respondents. Based on this delineation, 46 responses were identified as late respondents.

Independent samples t-tests of early and late respondents were used to test for nonresponse bias (see Table 3.5). Early respondents (those responding prior to the third email, $n = 135$) were compared to late respondents (those responding following the third email, $n = 46$) on the independent and dependent variables. A two-tailed independent t-test at the .05 alpha level was used to make sure that nonresponse did not threaten external validity or generalization of the findings. Overall, the power of the test varied from .0 to .20 for a negligible to small effect for each variable, indicating that the findings are generalizable to the population (Cohen, 1988). There were no significant differences between early and late respondents when assessing the independent and

dependent variables; therefore, the findings could be generalized to the population (Johnson & Shoulders, 2017; Lindner et al., 2001; Miller & Smith, 1983).

Table 3.5*Independent Samples t-Test of Early and Late Respondents to Test for Nonresponse Bias*

Variable	Early Respondents			Late Respondents			95% CI	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>				
Autonomy ^a	135	3.46	.68	46	3.55	.64	-.31, .14	-.75	.45	-.13
Competence ^b	135	4.10	.63	46	4.21	.48	-.32, .08	-1.18	.24	-.20
Relatedness ^c	135	3.70	.92	46	3.78	.78	-.38, .22	-.55	.59	-.09
SBAE Relatedness ^d	135	3.95	.84	46	3.89	.85	-.23, .34	.38	.71	.07
Psychological Needs Satisfaction ^e	135	3.75	.55	46	3.85	.49	-.28, .08	-1.06	.30	-.18
Turnover Intention ^f	135	3.13	1.74	46	2.97	1.67	-.43, .74	.53	.60	.09

^{a b c d e} 5-point scale (1 = strongly disagree, 5 = strongly agree)^f 7-point scale (1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree)**p* < .05. ***p* < .01

Data Analysis

Each questionnaire response was transferred from Qualtrics to SPSS Version 27. Once data were transferred into SPSS, the data were screened. All data were checked for errors or values that fell outside the range of possible values. Each variable's frequencies were inspected, and errors were corrected before total scores were calculated (Pallant, 2020). Because items requiring reverse scoring did not export properly, those items were edited to correct the errors. The reverse-scored items were the only errors detected, and changes were noted in a logbook. Additional examination of "extreme or outlier cases, significant predictors, significant results relating variables, insignificant predictors, or even demographics" also occurred (Creswell & Creswell, 2018, p. 222). One participant's birth year was flagged as an outlier but was confirmed as accurate. W-BNS responses in sections one and two were reviewed to verify that all responses fell within the 1-5 scale, while MOAQ-JSS responses in section three were examined to ensure that all replies fell within the 1-7 scale.

Testing Normality Assumption

Skewness and kurtosis statistics were analyzed to determine if the data for each variable were normally distributed. According to Garson (2012), when data were normally distributed, skew and kurtosis should be within the +2 to -2 range. The descriptive statistics for this study's variables are detailed in Table 3.6. The data were examined for normality by evaluating skewness and kurtosis values. In this study, kurtosis values (ranging from -.66 to .43) and skewness values (ranging from -.78 to .99) fell within acceptable ranges, indicating that the variables were normally distributed (see Table 3.6). Based on the skewness and kurtosis statistics, the distributions of autonomy

satisfaction, competence satisfaction, relatedness satisfaction (in their school district and within the SBAE profession), psychological need satisfaction, professional commitment measured by turnover intention, and years teaching SBAE were classified approximately normal.

Table 3.6

Descriptive Statistics for the Variables of Interest

Variable	<i>f</i>	<i>M</i>	<i>SD</i>	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Autonomy	181	3.48	.67	-.05	.18	-.59	.36
Competence	181	4.13	.59	-.78	.18	.43	.36
Relatedness	181	3.72	.89	-.45	.18	-.64	.36
Relatedness in SBAE	181	3.94	.84	-.48	.18	-.56	.36
Psychological Needs Satisfaction	181	3.76	.53	-.10	.18	-.60	.36
Turnover Intention	181	3.09	1.72	.54	.18	-.66	.36
Years Teaching	181	12.36	11.08	.99	.18	.32	.36

Research Question 1

What is the perceived basic psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?

To answer research question one, frequency counts, mean scores, minimum and maximum scores, standard deviations, and percentages were generated and analyzed regarding psychological need satisfaction collectively. W-BNS was used to measure the psychological needs satisfaction (Van den Broeck et al., 2010) of an SBAE teacher. The scale consisted of three subscales – autonomy satisfaction, competence satisfaction, and relatedness satisfaction – each with six questions for a total of 18 statements. The W-

BNS was scored by summing all items in aggregate and computing a mean score; subscale scores were calculated similarly.

Additionally, to answer research question one with the psychological needs satisfaction variables analyzed independently, frequency counts, mean scores, minimum and maximum scores, standard deviations, and percentages were generated and analyzed regarding autonomy satisfaction, competence satisfaction, and relatedness satisfaction independently. The W-BNS Autonomy Satisfaction subscale (Van den Broeck et al., 2010) consisted of six items. The W-BNS Competence Satisfaction subscale (Van den Broeck et al., 2010) consisted of six items. The W-BNS Relatedness Satisfaction subscale (Van den Broeck et al., 2010) consisted of six items. These analyses were duplicated as this variable was addressed in the context of the school district (six items) and separately in the context of the SBAE profession (six items).

Research Question 2

What is the perceived professional commitment of Minnesota SBAE teachers?

To answer research question two, frequency counts, mean scores, minimum and maximum scores, standard deviations, and percentages were generated and analyzed regarding professional commitment.

Research Question 3

To what extent does psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) predict SBAE teacher professional commitment?

To answer research question three, the relationship between psychological needs satisfaction and professional commitment was examined using correlation. Correlation is

a statistical method that uses a numerical index to determine the strength and degree of a relationship between two different variables (Coolidge, 2013; Johnson & Christensen, 2014; Pallant, 2020). Correlation allows for the relationship between two measured variables to be described and to make predictions from one variable to another (Jackson, 2015). Correlation is used to quantify the relationship between variables, and regression is used to predict one variable from another (Tabachnick & Fidell, 2013). Correlational methodology with regression analysis was chosen for its ability to best answer the research questions and depict the relationship between professional commitment and the independent variables. Additionally, regression analysis can determine the extent to which independent variables predicted a dependent variable. There was no manipulation of an independent variable in this study, so I used correlation analysis to examine the relationship between the independent variable, psychological needs satisfaction, and the dependent variable, professional commitment.

To answer the second part of research question three, the relationship between each psychological needs satisfaction subscale (i.e., autonomy satisfaction, competence satisfaction, and relatedness satisfaction) and professional commitment was examined independently using Pearson correlation.

Before performing a correlation analysis, a scatterplot was generated to check for a violation of assumptions of linearity and homoscedasticity (Pallant, 2020). The scatterplot (see Appendix M) was evaluated for outliers and determine if the relationship between two variables was positive or negative. Once the relationship between variables was established to be approximately linear, correlation could be calculated (Pallant,

2020). A correlation matrix displayed the interrelationships among the variables (Pallant, 2020).

Perceived Psychological Needs Satisfaction and Professional Commitment

The Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of the two variables, psychological needs satisfaction and professional commitment (Pallant, 2020). Statistical significance was tested ($*p < .05$. $**p < .01$), and confidence intervals set at 95%. When the correlation coefficient was greater than zero, there was a positive correlation, meaning that the two variables tend to move in the same direction. If the number was less than zero, there was a negative correlation, meaning that the scores tend to move in opposite directions. If the number is equal to zero, there is no correlation between the two variables (Coolidge, 2013; Johnson & Christensen, 2014). I used Cohen's (1988) thresholds for correlational validity (see Table 3.7).

Table 3.7

Cohen's Guidelines for Interpreting Correlation Coefficient Results

Interpretation	Correlation Value
Small correlation	0.10 to 0.29
Medium correlation	0.30 to 0.49
Strong correlation	0.50 to 1.0

Note. Interpretation of Correlation Coefficient (Cohen, 1988, p. 79-81).

Perceived Need Satisfaction of Autonomy, Competence, and Relatedness and Professional Commitment

To answer research question three, evaluating autonomy satisfaction independently, the Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of

autonomy and professional commitment (see null hypothesis one for discussion of correlation calculation). To evaluate competence satisfaction independently, the Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of competence and professional commitment (see research question three for discussion of correlation calculation). To evaluate relatedness satisfaction independently, the Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of relatedness and professional commitment analyzing both the context of the school district and the SBAE profession (see research question three for discussion of correlation calculation). Statistical significance for each analysis was tested ($*p < .05$. $**p < .01$), and confidence intervals set at 95%.

Research Question 4

To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?

To answer research question four, the Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of years teaching SBAE predict SBAE teacher psychological needs satisfaction (see research question three for discussion of correlation calculation). Statistical significance was tested ($*p < .05$. $**p < .01$), and confidence intervals set at 95%.

I sought to discover whether an observed correlation coefficient was statistically significant applying inferential statistics. Johnson and Christensen (2014) recommend the t-test for correlation coefficients as the "statistical test that is used to determine whether a correlation coefficient is statistically significant" (p. 752) between a quantitative dependent variable and a quantitative independent variable. To further analyze research question four, an independent-sample t-test was conducted to compare the mean scores for autonomy satisfaction, competence satisfaction, relatedness satisfaction, and psychological needs satisfaction for teachers with five or fewer years of teaching and teachers with more than five years teaching. The assumptions were met by using continuous measures for the dependent variable, checked for normal distribution, and evaluated for homogeneity of variance by performing the Levene test for equality of variances. The results were not significant (see Appendix M), so the research did not violate the assumption of homogeneity of variance.

Research Question 5

To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

To answer research question five, the Pearson product-moment correlation coefficient was evaluated to determine the strength and direction of the linear relationship between the mean scores of years teaching SBAE predict SBAE teacher professional commitment (see research question three for discussion of correlation calculation). Statistical significance was tested ($*p < .05$. $**p < .01$), and confidence intervals set at 95%.

To further analyze research question five, the years teaching independent variable and the professional commitment dependent variable measured by turnover intention were analyzed using a one-way analysis of variance at a significance level of .05 or less. The ANOVA (analysis of variance) is a statistical test for comparing the means of groups. Participants were grouped based on the number of years teaching SBAE. One-way ANOVA was designed to compare two or more group means for experiments with one quantitative dependent variable and one categorical independent variable. A one-way between groups of variance was conducted to explore the impact of years of experience on autonomy satisfaction, competence satisfaction, relatedness satisfaction, relatedness satisfaction within the SBAE profession, psychological needs satisfaction as measured by W-BNS total, and professional commitment, as measured by turnover intention. The assumptions were met by using continuous measures for the dependent variable, checked for normal distribution, and evaluated for homogeneity of variance by performing the Levene test for equality of variances. The results were not significant (see Appendix M), so the research did not violate the assumption of homogeneity of variance.

Hypothesis One

H_{01} : The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, psychological needs satisfaction of autonomy, competence, and relatedness collectively, and the response variable, SBAE teacher professional commitment.

To answer null hypothesis one, I conducted a hierarchical regression analysis to test the direct effect of psychological needs satisfaction of autonomy, competence, and

relatedness collectively (evaluating relatedness in the school district and relatedness in the SBAE profession separately) and SBAE teacher professional commitment.

Regression analysis enables the researcher to “predict an individual’s score on one variable based on knowing one or more other variables” (Jackson, 2015, p. 156). Tabachnick and Fidell (2013) defined regression analyses as a set of statistical techniques that allow the researcher to assess the relationship between one dependent variable and several independent variables. Regression techniques can be applied to a data set where "the independent variables are correlated with one another and with the dependent variable to varying degrees" (Tabachnick & Fidell, 2013, p. 118). Regression addressed how well a set of variables could predict an outcome and identify which variable was the best predictor (Pallant, 2020).

Regressions make several assumptions about the data. The census represented an acceptable sample size of 15 to 20 participants per predictor variable, with a minimum of 90 teachers completing the questionnaire (Field, 2013; Hair et al., 2014). Variables were also evaluated for multicollinearity and singularity (Tabachnick & Fidell, 2013). Before performing a simple regression analysis of the direct effect independent variable on the dependent variable, a scatterplot was generated to check for violation of assumptions of normality, linearity, and homoscedasticity (Tabachnick & Fidell, 2013). There were no violations (see Appendix M).

Hypothesis Two

H₀₂: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of autonomy, and the response variable, SBAE teacher professional commitment.

To answer null hypothesis two, a simple linear regression analysis to test the direct effect of need satisfaction of autonomy and SBAE teacher professional commitment (see hypothesis one for discussion of assumptions).

Hypothesis Three

H₀₃: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of competence, and the response variable, SBAE teacher professional commitment.

To answer null hypothesis three, a simple linear regression analysis to test the direct effect of need satisfaction of competence and SBAE teacher professional commitment (see hypothesis one for discussion of assumptions).

Hypothesis Four

H₀₄: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of relatedness, and the response variable, SBAE teacher professional commitment.

To test null hypothesis four, I conducted a simple linear regression analysis to test the direct effect of need satisfaction of relatedness in the school district and SBAE teacher professional commitment. I also conducted a simple linear regression analysis to test the direct effect of need satisfaction of relatedness in the SBAE profession and SBAE teacher professional commitment (see hypothesis one for discussion of assumptions).

Hypothesis Five

H₀₅: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher psychological needs satisfaction.

To test null hypothesis five, I conducted a simple linear regression analysis to test the direct effect of the years teaching SBAE independent variable on the psychological needs satisfaction dependent variable (see hypothesis one for discussion of assumptions).

Hypothesis Six

H₀₆: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher professional commitment.

To test null hypothesis six, I conducted a simple linear regression analysis of the direct effect of the years teaching independent variable on the professional commitment dependent variable measured by turnover intention. Regression analysis enables the researcher to “predict an individual’s score on one variable based on knowing one or more other variables” (Jackson, 2015, p. 156) (see hypothesis one for discussion of assumptions).

Assumptions

Certain assumptions were made concerning the participants of this study. It was assumed that:

- SBAE teachers have the capability to complete the online questionnaire.
- SBAE teacher participant responses accurately reflect their perceptions about teaching SBAE.
- The perceptions of psychological needs satisfaction held by SBAE teachers can be measured by the instruments outlined.
- The instruments adequately measure participants' perceptions.

- Responding SBAE teachers are representative of Minnesota's population of SBAE teachers.
- SDT assumes people are active organisms within an environment who strive to grow and integrate their experiences into a coherent sense of self (Deci & Ryan, 2000).

Limitations

While using a questionnaire as a quantitative research technique was the best option for this study to determine the correlation and predictive ability of the variables, it does not provide further insight into the unique experiences of each SBAE teacher. The questionnaire captured facts related to psychological needs satisfaction and SBAE teacher professional commitment; however, a mixed-methods approach with a qualitative component could have built upon quantitative findings. Such an approach would have allowed me to gather, evaluate, interpret, and synthesize both quantitative and qualitative data (Creswell & Creswell, 2018), reducing the likelihood that critical aspects were overlooked, or a mistake was made (Johnson & Christensen, 2014). A qualitative follow-up with participants may offer additional evidence to strengthen the data discovered using quantitative research methods.

SBAE teachers in Minnesota ($N=316$) who were currently in the profession as of May 2022 were the population for this study. Though responses from 181 SBAE teachers ($n=181$; 57.3%) were usable in this study, limitations may affect the generalizability of the results. From a gender perspective, this study included a disproportionate number of female teachers, as Minnesota had 143 female (45%) and 169 male (53%) SBAE teachers during the time of the research (Sheehan, 2021). Females represented 59% of

respondents, and males represented 40% of respondents in this study. There was also a disproportionate number of teachers without an agricultural education degree represented as 13% ($n=43$) of Minnesota SBAE teachers are alternatively licensed (Tier 1, 2, or Out of Field permission; Sheehan, 2021) but are 10% ($n=19$) of respondents in this study. Further research could explore how gender and licensure pathways influence psychological needs satisfaction and professional commitment.

A final potential limitation is that this research was conducted at the very end of the 2021-2022 school year. The perceptions of needs satisfaction and turnover intention may be influenced by the time of the year. Surveying Minnesota's SBAE teachers at a different time of the school year could increase the response rate and potentially alleviate the disproportionate participation.

Chapter Summary

This study aimed to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment. The census of Minnesota SBAE teachers ($N=316$) teaching in May of 2022 provided insight regarding the relationship between SBAE teachers' psychological needs satisfaction and professional commitment. A hypothesized model of psychological functioning and professional commitment illustrated the relationship in which psychological needs influence professional commitment positively. Professional commitment would improve if an SBAE teacher's psychological requirements were fulfilled. Autonomy satisfaction, competence satisfaction, relatedness satisfaction, and overall psychological needs fulfillment were measured by the W-BNS, and professional commitment was measured with the MOAQ-JSS, which measures

turnover intention. An expert panel verified the questionnaire's face validity and content validity. After consulting the expert panel, several minor adjustments were made to the online questionnaire and put into practice in pilot testing. Using an online questionnaire, data were collected in May and June of 2022 ($n=181$), and nonresponse error was controlled by comparing early and late respondents. The reliability coefficients of the constructs were calculated post-hoc, demonstrating consistent psychometric properties as previously reported research.

Chapter 4: Findings

Basic psychological needs satisfaction has been established to predict professional commitment; however, previous research has not addressed the prediction potential within the SBAE teacher population. By examining Minnesota SBAE teachers' psychological needs satisfaction, this study set out to investigate the predictability of professional commitment. Chapter 4 highlights the findings of this study.

Research Questions and Hypotheses

The purpose of this study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment. To accomplish this purpose, the following research questions were constructed:

RQ1: What is the perceived basic psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?

RQ2: What is the perceived professional commitment of Minnesota SBAE teachers?

RQ3: To what extent does psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) predict SBAE teacher professional commitment?

RQ4: To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?

RQ5: To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

The following null hypotheses were addressed in the study:

H₀₁: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, psychological needs satisfaction of autonomy, competence, and relatedness collectively, and the response variable, SBAE teacher professional commitment.

H₀₂: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of autonomy, and the response variable, SBAE teacher professional commitment.

H₀₃: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of competence, and the response variable, SBAE teacher professional commitment.

H₀₄: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of relatedness, and the response variable, SBAE teacher professional commitment.

H₀₅: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher psychological needs satisfaction.

H₀₆: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher professional commitment.

Research Question 1

What is the perceived basic psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?

To answer research question one, the descriptive statistics of the independent and dependent variables are shown in Table 4.1. W-BNS scale analysis was interpreted using mean scores of *strongly disagree* (1 – 1.49), *somewhat disagree* (1.5 – 2.49), *neither agree nor disagree* (2.5 – 3.49), *somewhat agree* (3.5 – 4.49), and *strongly agree* (4.5 – 5).

Table 4.1*Frequency Counts of Independent Variables by Mean Score*

Mean Score	Psychological Needs Satisfaction		Autonomy		Competence		Relatedness		SBAE Relatedness	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.00-1.99	0	-	0	-	0	-	6	3.3	1	.6
2.00-2.99	13	7.2	42	23.2	10	5.5	35	19.3	24	13.3
3.00-3.99	98	54.1	89	49.2	47	26.0	53	29.3	58	32.0
4.00-4.99	69	38.1	49	27.1	110	60.8	75	41.4	67	37.0
5.00	1	.6	1	.6	14	7.7	12	6.6	31	17.1

Note. The W-BNS scale anchors are *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5).

Table 4.2*Descriptive Statistics of Independent and Dependent Variables*

Variable	<i>f</i>	Mean	Min	Max	<i>SD</i>
Psychological Needs Satisfaction	181	3.78	2.44	5.00	.53
Autonomy	181	3.48	2.00	5.00	.67
Competence	181	4.13	2.17	5.00	.59
Relatedness	181	3.72	1.33	5.00	.89
SBAE Relatedness	181	3.94	1.50	5.00	.84
Turnover Intention	181	3.09	1.00	7.00	1.72

Note. The W-BNS scale scores are *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5). MOAQ-JSS is a 7-point Likert scale consisting of the following responses: *strongly disagree* (1), *disagree* (2), *slightly disagree* (3), *neither agree nor disagree* (4), *slightly agree* (5), *agree* (6), and *strongly agree* (7).

The findings indicate a score for each variable indicating that respondents tended to slightly agree that their basic psychological needs (collectively and individually) were being met. Respondents reported the highest mean score when it came to competence satisfaction, and the lowest mean score when it came to autonomy satisfaction. Responses varied the most in terms of relatedness in the school district and relatedness in the SBAE profession. Additionally, no respondent had a mean score of 1.00 which suggests that each respondent had some small degree of psychological need satisfaction; however, some respondents did have a mean score of 5.00, indicating they strongly agreed with every statement regarding their psychological needs satisfaction.

Basic Psychological Needs Satisfaction

Of the 181 respondents, basic psychological need satisfaction respondent mean scores ranged from 2.44 to 5.00, with an overall mean score of 3.78 (*SD* = .53). With a

3.0 anchor of *neither agree nor disagree* and a 4.0 anchor of *somewhat agree*, this suggests that 3.78 is slightly above a score that neither agrees nor disagrees that SBAE teachers' basic psychological needs are being fulfilled in the workplace. Thirteen of the 181 respondents (7.2%) somewhat or strongly disagree that their basic psychological needs are fulfilled in their workplace (see Table 4.1).

Perceived Need Satisfaction of Autonomy

Of the 181 respondents, autonomy need satisfaction scores were between 2.00 and 5.00, with a mean score of 3.48 ($SD = .67$) (see Table 4.2). Of the 181 respondents, 23.2% ($n = 42$) somewhat disagreed and 27.1% ($n = 49$) somewhat agreed that their need for autonomy was fulfilled in their workplace (see Table 4.1).

Perceived Need Satisfaction of Competence

The minimum mean score for competence need was 2.17, with a maximum score of 5.00 and a mean score of 4.13 ($SD = .59$) for the sub-scale (see Table 4.2), which means the respondents somewhat agree that competence satisfaction is being fulfilled in their workplace. A total of 68.5% respondents reported they somewhat agree or strongly agree with a score of 4.0 or higher (see Table 4.1).

Perceived Need Satisfaction of Relatedness

This variable was evaluated in the context of the school district and separately in the context of the SBAE profession. Relatedness need satisfaction, in the context of the school district, ranged from 1.33 to 5.00, with a mean score of 3.72 ($SD = .89$) for the sub-scale (see Table 4.2) which is interpreted as the respondents somewhat agree that relatedness satisfaction is being fulfilled in their school district.

When evaluating relatedness in the context of the SBAE profession, the lowest mean score was 1.5, the highest was 5.00, and the mean score was 3.94 ($SD = .84$) (see Table 4.2) which means the respondents somewhat agree that relatedness satisfaction is being fulfilled in the SBAE profession. Unlike other variables, 31 respondents had a 5.0 score (17.1%) of strongly agree when evaluating relatedness within the SBAE profession (see Table 4.1).

Research Question 2

What is the perceived professional commitment of Minnesota SBAE teachers?

To answer research question two, professional commitment is measured by a subscale of the MOAQ-JSS, designed to measure turnover intention. The minimum score regarding professional commitment measured by turnover intention was 1.00, the maximum score was 7.00, and the mean score was 3.09 ($SD = 1.72$) (see Table 4.2). Based on further analysis, the frequency counts and percentages of turnover intention summarized by mean score are shown in Table 4.3. Of the 181 respondents, 92 respondents have a score interpreted as low turnover intention (50.8%), 76 as neutral turnover intention (42.0%), and 13 as high turnover intention (7.2%). Most respondents had high professional commitment with a turnover intention below 3.0 (50.8%).

Table 4.3

Frequency Counts of Turnover Intention by Mean Score

	Turnover Intention	
	<i>f</i>	%
0-.99	0	-
1.00-1.99	52	28.7
2.00-2.99	40	22.1
3.00-3.99	25	13.8
4.00-4.99	31	17.1
5.00-5.99	20	11.0
6.00-6.99	5	2.8
7.00	8	4.4

Note. A respondent scale score between 1 and 2 was interpreted as low turnover

intention, 3 and 5 as neutral turnover intention, and 6 and 7 as high turnover intention (Cammann et al., 1983).

Research Question 3

To what extent does psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) predict SBAE teacher professional commitment?

The relationship between basic psychological needs satisfaction and professional commitment was examined using correlation, linear regression, independent-samples t-tests, and one-way ANOVA to answer research question three. The relationship between basic psychological needs satisfaction (as measured by the W-BNS scale) and professional commitment (measured as turnover intention by the MOAQ JSS) was examined using Pearson product-moment correlation coefficient. A medium, negative correlation was found between the two variables [$r = -.49, n = 181, p < .01$], with high psychological needs satisfaction levels associated with lower levels of turnover intention (see Table 4.4).

Table 4.4*Means, Standard Deviations, and Correlations among Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Autonomy Satisfaction	3.48	.67	-					
2. Competence Satisfaction	4.13	.59	.40**	-				
3. Relatedness Satisfaction	3.72	.89	.40**	.17*	-			
4. Relatedness Satisfaction in SBAE Profession	3.94	.84	.22**	.27**	.36**	-		
5. Psychological Needs Satisfaction	3.78	.53	.79**	.63**	.79**	.39**	-	
6. Years of Experience	12.36	11.08	.24**	.45**	.01	.11	.28**	
7. Turnover Intention	3.09	1.72	-.57**	-.38**	-.20**	-.19*	-.49**	-.21**

* $p < .05$. ** $p < .01$ **Need Satisfaction of Autonomy and Professional Commitment**

There was a strong, negative correlation between the two variables [$r = -.57$, $n = 181$, $p < .01$], with high autonomy satisfaction levels associated with lower levels of turnover intention (see Table 4.4).

Need Satisfaction of Competence and Professional Commitment

There was a medium, negative correlation between the two variables [$r = -.38$, $n = 181$, $p < .01$], with high competence satisfaction levels associated with lower levels of turnover intention (see Table 4.4).

Need Satisfaction of Relatedness and Professional Commitment

There was a small, negative correlation between relatedness within the school district and turnover intention [$r = -.20$, $n = 181$, $p < .01$], with high relatedness

satisfaction levels associated with lower levels of turnover intention (see Table 4.4). There was also a small, negative correlation between relatedness within SBAE and turnover intention [$r = -.19, n = 181, p < .05$], with high relatedness satisfaction levels associated with lower levels of turnover intention (see Table 4.4).

Research Question 4

To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?

I analyzed the relationship between psychological needs satisfaction and professional commitment to address research question four. Once descriptive statistics were analyzed, the relationship between psychological needs satisfaction and professional commitment was examined using correlation, independent-samples t-tests, and one-way ANOVA.

Correlation

The relationship between psychological needs satisfaction (as measured by the W-BNS scale) and professional commitment (measured as turnover intention by the MOAQ-JSS) was examined using Pearson product-moment correlation coefficient. There was a small, positive correlation between the two variables [$r = .28, n = 181, p < .01$], with more years of experience associated with higher levels of psychological needs satisfaction (see Table 4.7).

t-Tests Considering More and Less than Five Years of Experience

An independent-samples t-test was conducted to compare the scores for autonomy satisfaction, competence satisfaction, relatedness satisfaction in the school district and in

the SBAE profession, and psychological needs satisfaction for teachers with five or fewer years of teaching and teachers with more than five years teaching. This comparison is shown in Table 4.5. When assessing competence satisfaction, there was a significant difference in scores for teachers with five or fewer years teaching ($M=3.91$, $SD=.60$) and teachers with more than five years ($M=4.26$, $SD=.55$). Additionally, when evaluating overall psychological needs satisfaction, a significant difference existed in scores for teachers with five or fewer years teaching ($M=3.66$, $SD=.50$) and teachers with more than five years ($M=3.85$, $SD=.54$). When assessing autonomy, relatedness satisfaction within the teacher's school district, and relatedness satisfaction within the SBAE profession, there was no significant difference in scores for teachers with five or fewer years teaching and teachers with more than five years (see Table 4.5).

Table 4.5

Independent Samples t Test Comparing Independent Variables and Years Teaching

Variable	5 or Fewer Years Teaching			More than 5 Years Teaching			95% CI	<i>t</i>	<i>df</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>			
	Autonomy	70	3.38	.66	111	3.55			
Competence	70	3.91	.60	111	4.26	.55	-.52, -.17	-3.96	179
Relatedness	70	3.70	.83	111	3.73	.93	-.29, .24	-.179	179
SBAE Relatedness	70	3.78	.85	111	4.03	.83	-.50, .00	-1.95	179
Psychological Needs Satisfaction	70	3.66	.50	111	3.85	.54	-.34, -.02	-2.24	179
Turnover Intention	70	3.13	1.76	111	3.06	1.70	-.44, .60	.29	179

ANOVA

An ANOVA was conducted to explore the impact of years of experience on autonomy satisfaction, competence satisfaction, relatedness satisfaction, relatedness

satisfaction within the SBAE profession, and psychological needs satisfaction as measured by W-BNS total. To help characterize the career experiences of participants, Huberman's (1989) model of the professional life cycle of teachers was used to group participants based on years teaching (Group 1: 0-3 years; Group 2: 4-6 years; Group 3: 7-18 years; Group 4: 19-30 years; Group 5: more than 31 years) using Huberman's (1989) Teacher Career Cycle Model's breakdown for years.

A one-way ANOVA of variables by grouped years of experience at a significance level of .05 or less is shown in Table 4.6, comparing the means and standard deviations for each variable by group. When considering autonomy satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ($F(4,175) = 4.52, p = .01$). Additionally, a large effect size, calculated using eta squared, was .09. A Tukey post hoc test revealed that years teaching SBAE was statistically significant for autonomy needs satisfaction when comparing group one (0-3 years; $M=3.34, SD = .62$) and group three (7-18 years; $M=3.37, SD = .64$) to five (more than 31 years; $M=4.04, SD = .73$). There was no statistically significant difference between the remaining groups.

Table 4.6

Mean, Standard Deviation, and Post Hoc One-Way Analyses of Variance Multiple Comparisons for Years Teaching SBAE and Psychological Needs Satisfaction and Turnover Intention

Measure	1 – 3 Years (n=55)		4 – 6 Years (n=20)		7 – 18 Years (n=58)		19 – 30 Years (n=32)		31 – 40 Years (n=16)		F	η^2
	M	SD	M	SD	M	SD	M	SD	M	SD		
	Autonomy	3.34	.62	3.67	.79	3.37	.64	3.54	.57	4.04		
Competence	3.85	.61	4.11	.51	4.09	.59	4.38	.46	4.66	.38	8.76**	.17
Relatedness	3.69	.80	3.88	.91	3.60	.99	3.76	.85	3.90	.83	.61	.01
SBAE Relatedness	3.82	.83	3.81	.89	3.97	.83	3.99	.89	4.19	.72	.79	.02
Psychological Needs	3.63	.46	3.91	.59	3.68	.55	3.89	.49	4.20	.48	5.08**	.10
Turnover Intention	3.08	1.79	3.25	1.60	3.53	1.73	2.78	1.48	2.02	1.72	2.93*	.06

Note. Years teaching groups (Group 1: 0-3 years; Group 2: 4-6 years; Group 3: 7-18 years; Group 4: 19-30 years; Group 5: more than 31 years)

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

When considering competence satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ($F(4,176) = 4.52, p = .01$). Additionally, a large effect size, calculated using eta squared, was .17. A Tukey post hoc test revealed that years teaching SBAE was statistically significant for competence needs satisfaction when comparing group one (0-3 years; $M=3.85, SD = .61$), group two (4-6 years; $M=4.11, SD = .51$) and group three (7-18 years; $M=4.09, SD = .59$) to five (more than 31 years; $M=4.66, SD = .38$). Group one (0-3 years; $M=3.85, SD = .61$) was significantly different than group four (19-30 years; $M=4.38, SD = .46$). There was no statistically significant difference between the remaining groups.

When considering relatedness satisfaction in the school district, there was no statistically significant difference between groups as determined by one-way ANOVA ($F(4,176) = .61, p = .65$). When considering relatedness satisfaction in the SBAE profession, there was no statistically significant difference between groups as determined by one-way ANOVA ($F(4,176) = .79, p = .53$). A small effect size was calculated for each comparison.

When considering psychological needs satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ($F(4,175) = 5.08, p = .01$). Additionally, a large effect size, calculated using eta squared, was .10. A Tukey post hoc test revealed that years teaching SBAE was statistically significant for psychological needs satisfaction when comparing group one (0-3 years; $M=3.63, SD = .46$) and group three (7-18 years; $M=3.68, SD = .55$) to five (more than 31 years; $M=4.20, SD = .48$). There was no statistically significant difference between the remaining groups.

An ANOVA was also conducted to explore the impact of years of experience on professional commitment. When considering professional commitment as measured by turnover intention, there was a statistically significant difference between groups as determined by one-way ANOVA ($F(4,176) = 2.93, p = .02$). Additionally, a medium effect size, calculated using eta squared, was .06. A Tukey post hoc test revealed that years teaching SBAE was statistically significant for turnover intention when comparing group three (7-18 years; $M=3.53, SD=1.73$) to five (more than 31 years; $M=2.02, SD=1.72$). There was no statistically significant difference between the remaining groups.

Research Question 5

To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

To test research question five, the relationship between years teaching SBAE and professional commitment (measured as turnover intention by the MOAQ-JSS) was examined using Pearson product-moment correlation coefficient. There was a small, negative correlation between the two variables [$r = -.21, n = 181, p < .01$], with more years of experience associated with lower levels of turnover intention (see Table 4.4). A one-way ANOVA of variables grouped by years of experience at a significance level of .05 or less showed no statistically significant difference between any groups.

Hypothesis One

H_{01} : The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, psychological needs satisfaction of autonomy, competence, and relatedness collectively, and the response variable, SBAE teacher professional commitment.

To control for demographic and professional characteristics statistically, the control variables of gender, years teaching, age, and certification type were entered as block one in the hierarchical regression analysis (HRA). The results are shown in Table 4.7. This group of variables described 2% ($R^2 = .02$) of the variance in professional commitment as measured by turnover intention. Block two involved the addition of autonomy satisfaction, competence satisfaction, and relatedness satisfaction in the school district, and theory supported this decision. Adding the variables of satisfaction of autonomy, competence, and relatedness in the school district resulted in an additional 31% ($\Delta R^2 = .31$) of the variance being explained. The full model, including relatedness satisfaction in the school district, explained 33% of the variance in professional commitment.

Table 4.7

Hierarchical Regression Analysis of Variables Including Relatedness in the School District Predicting Professional Commitment

Variable	B	SE	β	p	R^2	ΔR^2
Step 1 (control variables)					.05	.02
Gender	-.08	.27	-.02	.78		
Years Teaching	-.03	.02	-.16	.29		
Age	-.01	.02	-.07	.65		
Certification Type	-.01	.07	-.01	.93		
Step 2					.36**	.33**
Gender	-.05	.22	-.02	.82		
Years Teaching	-.00	.02	-.02	.89		
Age	.00	.02	.03	.82		
Certification Type	.05	.06	.05	.46		
Autonomy	-1.33	.19	-.52	.01**		
Competence	-.52	.21	-.18	.01*		
Relatedness in School District	-.06	.13	-.03	.64		

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

The HRA was duplicated, replacing relatedness satisfaction in the school district with relatedness satisfaction in the SBAE profession, and theory supported this decision. Block two involved the addition of autonomy satisfaction, competence satisfaction, and relatedness satisfaction in the SBAE profession, and theory supported this decision. Adding the variables of satisfaction of autonomy, competence, and relatedness in the SBAE profession resulted in an additional 31% ($\Delta R^2 = .31$) of the variance being explained, and results are shown in Table 4.8. The full model, including relatedness satisfaction in the SBAE profession, explained 33% of the variance in professional commitment. The coefficient β for psychological needs satisfaction is not equal to zero. Therefore, it was deemed statistically significant, and the results reject the null hypothesis.

Table 4.8

Hierarchical Regression Analysis of Variables Including Relatedness in the SBAE Profession Predicting Professional Commitment

Variable	B	SE	β	p	R^2	ΔR^2
Step 1 (control variables)					.05	.02
Gender	-.08	.27	-.02	.78		
Years Teaching	-.03	.02	-.16	.29		
Age	-.01	.02	-.07	.65		
Certification Type	-.01	.07	-.01	.93		
Step 2					.36**	.33**
Gender	-.06	.22	-.02	.80		
Years Teaching	-.00	.02	-.02	.88		
Age	.00	.02	.02	.85		
Certification Type	.04	.06	.05	.49		
Autonomy	-1.28	.18	-.50	.01**		
Competence	-.50	.21	-.17	.02*		
Relatedness in SBAE Profession	-.05	.13	-.02	.73		

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

Hypothesis Two

H₀₂: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of autonomy, and the response variable, SBAE teacher professional commitment.

Results of the regression analysis demonstrated that autonomy satisfaction does predict professional commitment as measured by intention to turnover (see Table 4.9; Appendix N). Based on the regression analysis, autonomy significantly predicted turnover intention, $F(1, 179) = 85.65, p < .01$, which indicates that autonomy satisfaction can play a significant role in professional commitment ($b = -.57, p < .01$). Statistical significance was tested, and confidence intervals set at 95%. These results reveal the effect of autonomy satisfaction decreasing turnover intention. Moreover, the $R^2 = .32$ depicts that the model explains 32% of the variance in turnover intention. The confidence intervals for the effect of autonomy on turnover intention, $b = -1.46, 95\% \text{ CI}[-1.77, -1.15]$, do not contain a zero, and the coefficient β_1 is not equal to zero. Therefore, it was deemed statistically significant, and the results reject the null hypothesis.

Table 4.9

Regression Analysis of Autonomy Satisfaction Predicting Professional Commitment

	B	SE	β	t	p	95% CI
Autonomy	-1.46	.16	-.57	-9.26	<.01**	-1.77, -1.15

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

Hypothesis Three

H₀₃: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of competence, and the response variable, SBAE teacher professional commitment.

Results of the regression analysis demonstrated that competence satisfaction does predict professional commitment as measured by intention to turnover (see Table 4.10; Appendix O). Competence significantly predicted turnover intention, $F(1, 179) = 30.00, p < .01$, which indicates that competence satisfaction can play a significant role in professional commitment ($b = -.38, p < .001$). Statistical significance was tested, and confidence intervals set at 95%. These results clearly direct the effect of competence satisfaction decreasing turnover intention. Moreover, the $R^2 = .14$ depicts that the model explains 14% of the variance in turnover intention (see Appendix O). The confidence intervals for the effect of competence on turnover intention, $b = -1.10, 95\% \text{ CI}[-1.50, -.70]$, do not contain a zero, and the coefficient β_1 is not equal to zero. Therefore, it was deemed statistically significant. The results reject the null hypothesis.

Table 4.10

Regression Analysis of Competence Satisfaction Predicting Turnover Intention

	B	SE	β	t	p	95% CI
Competence	-1.10	.20	-.38	-5.48	<.01**	-1.50, -.70

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

Hypothesis Four

H₀₄: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, need satisfaction of relatedness, and the response variable, SBAE teacher professional commitment.

The regression analysis of relatedness satisfaction in the school district predicting turnover intention can be found in Table 4.11 (see Appendix P). Based on a regression analysis, relatedness in a school district significantly predicted turnover intention, $F(1, 179) = 7.50, p = .01$, which indicates that relatedness satisfaction in a school district can

play a significant role in professional commitment ($b = -.39, p = .01$). Statistical significance was tested, and confidence intervals set at 95%. These results explain that relatedness satisfaction in the school district decreased turnover intention. Moreover, the adjusted $R^2 = .04$ depicts that the relatedness satisfaction in the school district explains 4% of the variance in turnover intention. The confidence intervals for the effect of relatedness in the school district on turnover intention, $b = -.39, 95\% \text{ CI}[-.67, -.11]$, do not contain a zero, and the coefficient β_1 is not equal to zero. Therefore, it was deemed statistically significant. The results reject the null hypothesis.

Table 4.11

Regression Analysis of Relatedness Satisfaction in the School District Predicting Turnover Intention

	B	SE	β	t	p	95% CI
Relatedness	-.39	.14	-.20	-2.74	.01**	-.67, -.11

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

The regression analysis of relatedness satisfaction in SBAE predicting turnover intention can be found in Table 4.12. Results of the analysis demonstrated that relatedness satisfaction in SBAE does predict professional commitment as measured by intention to turnover. Based on a regression analysis, relatedness in SBAE significantly predicted turnover intention, $F(1, 179) = 6.53, p = .011$, which indicates that relatedness satisfaction in SBAE can play a significant role in professional commitment ($b = -.38, p = .01$). Statistical significance was tested, and confidence intervals set at 95%. These results explain that relatedness satisfaction in SBAE decreased turnover intention. Moreover, the adjusted $R^2 = .03$ depicts that the relatedness satisfaction in SBAE explains 3% of the variance in turnover intention (see Appendix P). The confidence intervals for the effect of

relatedness in SBAE on turnover intention, $b = -.38$, 95% CI[$-.68, -.09$], do not contain a zero, and therefore, it was deemed statistically significant. The results reject the null hypothesis.

Table 4.12

Regression Analysis of Relatedness Satisfaction in SBAE Predicting Turnover Intention

	B	SE	β	t	p	95% CI
SBAE Relatedness	-.38	.15	-.19	-2.56	.01**	-.68, -.09

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

Hypothesis Five

H₀₅: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher psychological needs satisfaction.

A regression analysis of years teaching predicting psychological needs satisfaction is shown in Table 4.13. Results of the analysis demonstrated that years teaching does predict psychological needs satisfaction, $F(1, 179) = 14.62, p < .01$. Statistical significance was tested, and confidence intervals set at 95%. These results clearly direct the effect of years teaching increasing psychological needs satisfaction. Moreover, the $R^2 = .08$ depicts that the years teaching SBAE explains 8% of the variance in psychological needs satisfaction. Confidence intervals for the effect of autonomy on turnover intention, $b = .01$, 95% CI[$.01, .02$], do not contain a zero, and the coefficient β_1 is not equal to zero. Therefore, it was deemed statistically significant. The results reject the null hypothesis.

Table 4.13*Regression Analysis of Years Teaching SBAE Predicting Psychological Needs**Satisfaction*

	B	SE	β	t	p	95% CI
Years of Experience	.013	.003	.275	3.824	<.001**	.006, .020

* $p < .05$. ** $p < .01$ **Hypothesis Six**

H₀₆: The coefficient β_1 is equal to zero, indicating there is no statistically significant relationship between predictor variable, years teaching SBAE, and the response variable, SBAE teacher professional commitment.

To test null hypothesis six, I conducted a linear regression analysis to measure the direct effect of the years teaching independent variable on the professional commitment dependent variable, measured by turnover intention (see Table 4.14). A significant regression equation was found ($F(1,179) = 8.19, p < .001$), with an R^2 of .04. A linear regression analysis of years teaching SBAE resulted in 4% of the variability in turnover intention being explained. Years teaching significantly predicted turnover intention; as years of experience increase by 1, turnover intention is predicted to decrease by .03.

Table 4.14*Linear Regression Analysis Summary for Turnover Intention*

Variable	Turnover Intention			
	B	SE	β	p
Years of Experience	-.03	.01	-.21	.01**

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

Statistical significance was tested, and confidence intervals set at 95%. The confidence intervals for the effect of years of experience on turnover intention, $b = -.03$, 95% CI[-.06, -.01], do not contain a zero, and the coefficient β_1 is not equal to zero. Therefore, it was deemed statistically significant. The results reject the null hypothesis.

Chapter Summary

The purpose of this study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to and could predict teachers' professional commitment. Results of regression analysis revealed that autonomy satisfaction, competence satisfaction, relatedness satisfaction in a school district, relatedness satisfaction in the SBAE profession, psychological needs satisfaction, and years teaching SBAE were significant predictors of professional commitment as measured by intention to turnover. Results of the analysis also demonstrated that years of experience significantly predict professional commitment and psychological needs satisfaction. In summary, psychological needs satisfaction (including autonomy, competence, and relatedness collectively and independently) and years teaching SBAE were significant predictors of professional commitment.

Chapter 5: Summary, Conclusion, Implications, and Recommendations

Teachers must be kept in the classroom to meet the demand for SBAE teachers across the United States. However, existing research had not fully considered psychological needs satisfaction of SBAE teachers or the relationship between needs satisfaction and professional commitment of SBAE teachers. In this study, the implications of psychological need fulfillment were considered to better understand the psychological needs satisfaction of SBAE teachers who remained in the field and were retained year after year. This chapter presents a discussion of the findings, conclusions, and implications based on the findings and existing literature and recommendations for future research.

Summary of Findings

Teachers' basic psychological needs have been highlighted as crucial to job satisfaction and professional commitment (Baard et al., 2004; Collie et al., 2016; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014). However, the satisfaction of SBAE teachers' psychological needs or the relationship between those needs and teacher professional commitment had not before been investigated. Given the relationship between psychological needs satisfaction and teacher professional commitment (Lee & Nie, 2014; Mabekoje et al., 2016), as well as the need to identify factors influencing Minnesota SBAE teacher retention, it was critical to investigate Minnesota SBAE teachers' psychological needs satisfaction and professional commitment.

Although psychological needs satisfaction may vary from person to person, as professional commitment variables were analyzed, discoveries developed from each research question. Minnesota SBAE teachers somewhat agreed that basic psychological

needs were met in the workplace, with a mean score of 3.78 ($SD = .53$). Of the three psychological needs, competence had the highest mean score of 4.13 ($SD = .59$), indicating Minnesota SBAE teachers somewhat agree that their psychological need satisfaction for competence is being fulfilled. Respondents also somewhat agree that their need for relatedness within the SBAE profession is fulfilled with a mean score of 3.94 ($SD = .84$) and somewhat agreed their need for relatedness within the school district is fulfilled with a mean score of 3.72 ($SD = .89$). Autonomy need satisfaction had a mean score of 3.48 ($SD = .67$) signifying Minnesota SBAE teachers neither agreed nor disagreed that their psychological need for autonomy was being fulfilled in their workplace. The mean score regarding turnover intention was 3.09 ($SD = 1.72$), signifying neutral turnover intention, which measured professional commitment.

The findings of this research reject each of the six null hypotheses. Overall, satisfaction of autonomy, competence, and relatedness (in the school district or the SBAE profession) resulted in 31% of the variance of SBAE teacher professional commitment being explained. When each psychological need is analyzed individually, each is statistically significant. Furthermore, autonomy satisfaction explains 32% of the variance in turnover intention, competence satisfaction explains 14% of the variance, relatedness satisfaction in the school district explains 4% of the variance, and relatedness satisfaction in the SBAE profession explains 3% of the variance. When considering the effect of years teaching SBAE, these results clearly demonstrate the effect of years teaching increasing and explaining 8% of the variance in psychological needs satisfaction. Additionally, years teaching SBAE significantly predicted turnover intention as an analysis of years teaching SBAE resulted in 4% of the variability in turnover intention

being explained. In summary, years of teaching SBAE and satisfaction of psychological needs (including autonomy, competence, and relatedness collectively and independently) were significant predictors of professional commitment.

Conclusions and Discussion

Hypothesized connections were tested simultaneously with a conceptual model where SBAE teachers' psychological needs satisfaction and professional commitment were examined. Overall, results revealed that psychological needs satisfaction of autonomy, competence, and relatedness (independently and collectively) have a significant and negative impact on turnover intention, which was used to measure professional commitment. According to the data, competence and autonomy are the primary predictors of professional commitment. These results align with previous research on teachers that indicated autonomy (Collie et al., 2016) and competence (Palmer, 2020) were indicators of professional commitment. It was determined that satisfying SBAE teachers' psychological needs, especially the need for autonomy and competence, are an essential component of Minnesota SBAE teacher retention.

These data also show a significant and positive correlation between increased years teaching SBAE and psychological needs satisfaction. Likewise, increased years teaching SBAE have a significant and negative correlation with turnover intention. Thus, psychological needs must be satisfied in the school district and SBAE professional work environments to boost professional commitment and retain SBAE teachers. The results of this research build on the existing evidence of psychological needs satisfaction influencing a teacher's choice to stay in the profession and provide new insight into this relationship in SBAE. While previous research has focused on a variety of factors

influencing SBAE teacher retention, these results demonstrate that psychological needs satisfaction is a predictor.

Implications

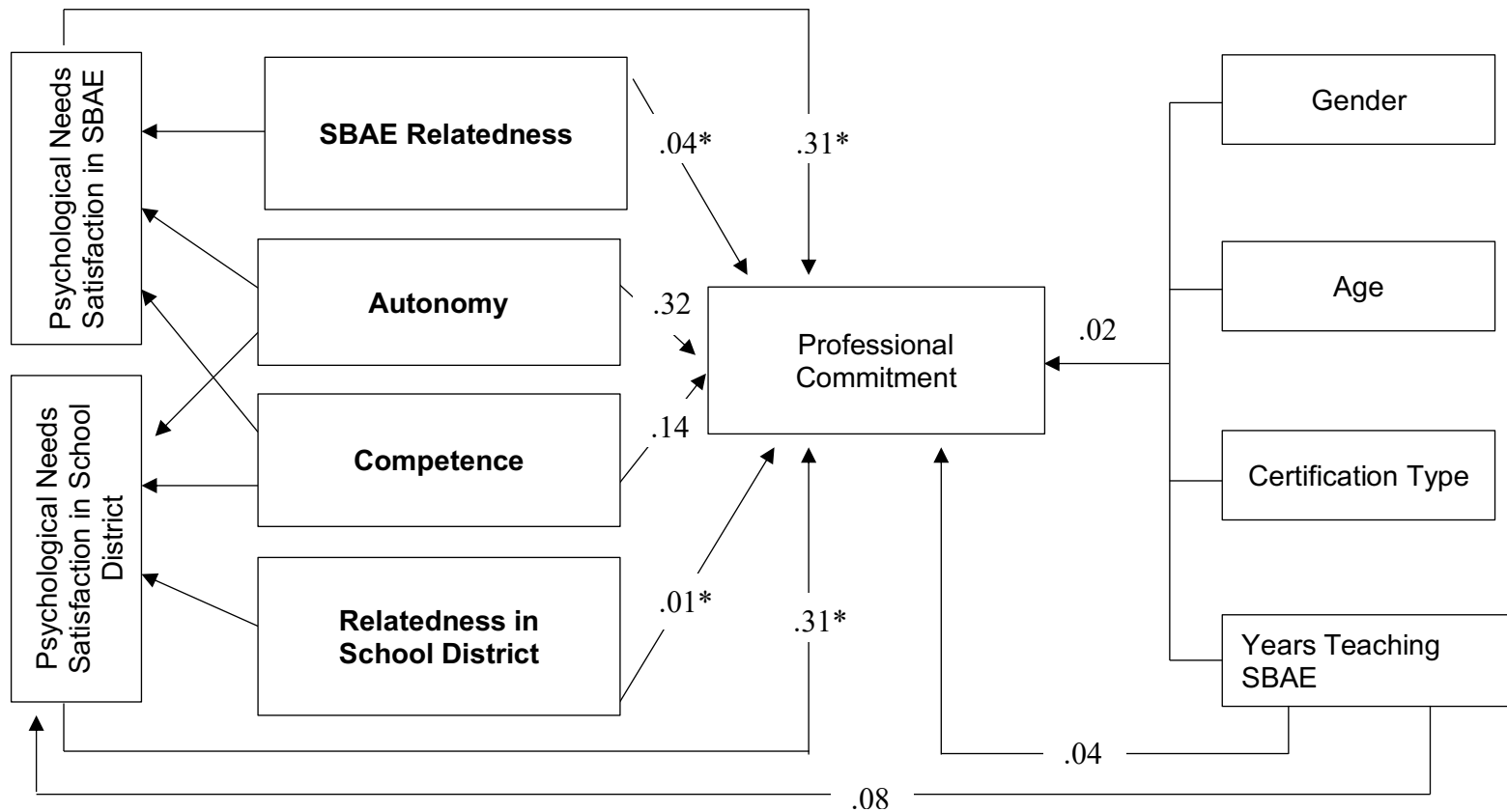
Theoretical and Conceptual Implications

Anchored by the conceptual understanding of SDT, this study aimed to examine if and to what extent psychological needs satisfaction were related to and could predict teachers' professional commitment. In relation to the conceptual model hypothesized, the obtained results reveal the relationships expected among variables (see Figure 5.1) with autonomy, competence, relatedness in the school district, and relatedness in the SBAE profession predicting SBAE teachers' professional commitment. The findings of this study affirm that psychological need satisfaction of autonomy, competence, and relatedness (independently and collectively) are related to and are statistically significant predictors of Minnesota SBAE teachers' professional commitment.

Collectively, psychological need satisfaction in the school district (i.e., autonomy satisfaction, competence satisfaction, and relatedness in the school district satisfaction) has a negative and significant effect on SBAE teachers' turnover intention ($\Delta R^2 = .31$), resulting in a positive impact on professional commitment. Additionally, psychological need satisfaction in the SBAE profession (i.e., autonomy satisfaction, competence satisfaction, and relatedness in the SBAE profession satisfaction) has a negative and significant effect on SBAE teachers' turnover intention ($\Delta R^2 = .31$), resulting in a positive impact on professional commitment. The data also suggest that competence and autonomy are the most significant predictors of professional commitment.

Figure 5.1

Relationship Among Psychological Needs Satisfaction, Professional Commitment, and Teacher Demographic Variables as Determined by Regression Analysis



Note: * $p < .01$

The results examining needs satisfaction independently reveal each has a negative and significant effect on turnover intention (autonomy $\Delta R^2 = .32$; competence $\Delta R^2 = .14$; relatedness in the school district $\Delta R^2 = .01$; relatedness in the SBAE profession $\Delta R^2 = .04$). This suggests that SBAE teachers with perceived psychological need satisfaction have increased professional commitment. Finally, the results examining years teaching SBAE reveal a negative and significant effect on psychological needs satisfaction ($\Delta R^2 = .08$) and turnover intention ($\Delta R^2 = .04$).

These findings align with earlier findings (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016) that showed teachers' needs for autonomy, competence, and relatedness were correlated with professional commitment. The SDT supported the findings that psychological functioning predicted professional commitment. The results support prior research, which advocates that a need-satisfying work environment for teachers is valuable because it promotes healthy psychological functioning and leads to commitment (Lee & Nie, 2014; Mabekoje et al., 2016). SBAE teachers' satisfaction of psychological needs in the workplace significantly impacts their professional commitment.

Control Variable Implications

The demographics of Minnesota's SBAE teacher population are changing, and based on the data of this research, some findings are unique to specific demographic characteristics related to gender, years teaching SBAE, and certification type. Though outside the purview of this study, the additional findings merit further examination due to the correlation between variables.

Gender

The data offer strong support that distinct factors influence male and female SBAE teachers' intentions to leave their jobs. While male and female teachers had a statistically significant correlation between psychological needs satisfaction and professional commitment in this study, the correlation was stronger with female SBAE teachers. SBAE literature has investigated the shift in the profession to having more female SBAE teachers under the age of 40, which aligned with the findings of this study, and the stress and job satisfaction levels concerning work-life balance (Hainline et al., 2015; Solomonson & Retallick, 2018; Sorensen & McKim, 2014).

The data also imply that years of experience and relatedness satisfaction in the SBAE profession are more strongly connected with male teachers' intentions to leave the profession. However, autonomy satisfaction, competence satisfaction, and relatedness satisfaction in the school district are more strongly associated with the intention of female SBAE teachers to leave the profession. The sizable disparity in scores between male and female teachers' competence fulfillment was also an intriguing discovery, as there was a significant difference in scores for male ($M=4.26$, $SD=.62$) and female ($M=4.02$, $SD=.57$) SBAE teachers. It is important to recognize that these differences that appear to correlate to gender may also be due to other demographic characteristics. A possible reason for this disparity might be the age of the participants because though the male participants in the SBAE research had an average experience of 17.22 years, female participants had an average experience of 8.98 years. The psychological needs satisfaction of SBAE teachers exploring the influence of gender warrants further research and discussion. Further research is needed to explore how SBAE teacher gender influences psychological need satisfaction and what supports improve need fulfillment.

Years Teaching SBAE

When considering psychological needs satisfaction, there was significant difference in scores for teachers with three or fewer years teaching ($M=3.63$, $SD=.46$), those with 7-18 years ($M=3.68$, $SD=.55$), and teachers with more than 31 years ($M=4.20$, $SD=.53$). When evaluating the independent psychological need satisfaction data comparing SBAE teachers with varying years of experience by group, differences were identified between groups. Years teaching SBAE was statistically significant for need satisfaction of autonomy when comparing teachers with fewer than three years experience ($M=3.34$, $SD=.62$), those with 7-18 years ($M=3.37$, $SD=.64$), and those with more than 31 years ($M=4.04$, $SD=.73$). When considering competence satisfaction, there were statistically significant differences between the three groupings of teachers with fewer than 18 years of teaching and those with more than 31 years (see Table 4.6). However, satisfaction of relatedness in the school district and relatedness in the SBAE profession has no significant difference in scores. These results support other studies' findings, which provide compelling evidence of a connection between teachers' perceived competence satisfaction and years of employment (Hobson & Maxwell, 2017; Palmer, 2020), including a specific link in SBAE teachers gaining competence and commitment as they gain experience (McKim et al., 2017).

These findings suggest that as SBAE teachers gain experience, they perceive themselves as more competent. However, there was a decrease in the mean competence satisfaction for those teachers with 7-18 years of experience, which then continued to increase with years of experience. Given the number of Minnesota SBAE teachers with three or fewer years of experience and the significantly lower mean for teachers with

fewer than 18 years of experience compared to those with 31 or more years, support for early- and mid-career teachers' psychological need satisfaction is critical to the sustainability of Minnesota SBAE.

Certification Type

An influx of alternatively licensed teachers has occurred as program and teacher demand increase, and licensure rules have changed in Minnesota. Rather than completing a teacher preparation program, these individuals without a degree in agricultural education obtained their teaching licenses through a combination of relevant work experience, coursework, a portfolio process, years teaching experience, and licensure testing (see Appendix A; Minnesota Professional Educator Licensing and Standards Board, 2021). As a result, these individuals have unique perceptions considering psychological need satisfaction of autonomy, competence, and relatedness.

No significant difference was found when evaluating the influence of an agricultural education undergraduate versus graduate degree on competence fulfillment. However, the results of those with an agricultural degree (undergraduate and/or graduate) were compared to those without an undergraduate or graduate degree in agricultural education. A moderate, negative correlation (see Appendix Q) was found for SBAE teachers without an agricultural education undergraduate and/or graduate degree between the two variables [$r = -.57, n = 181, p < .01$], with high competence satisfaction levels associated with lower levels of turnover intention, with low, negative correlation for those with an agricultural education degree [$r = -.37, n = 181, p < .01$]. The data also suggest a difference between turnover intention and need satisfaction for relatedness in the school district. A significant, low negative correlation [$r = -.20, n = 181, p < .05$] exists

for teachers with an agricultural education degree and turnover intention, but the correlation is not significant for those without an agricultural education degree. These results indicate a significant correlation between need fulfillment of competence and relatedness in the school district and SBAE teacher professional commitment, but there are differences to explore with alternatively certified teachers.

The data also identify differences between those with and without an agricultural education degree when considering the impact of years teaching SBAE. There was a medium, positive correlation [$r = .30, n = 181, p < .01$] with SBAE teachers with an agricultural education degree between psychological need satisfaction and years teaching SBAE, meaning that with more years teaching, psychological needs satisfaction increases, but the correlation is not significant for those without an agricultural education degree. The data show a significant but negligible, positive correlation [$r = .27, n = 181, p < .01$] with SBAE teachers with an agricultural education degree between autonomy satisfaction and years teaching SBAE, but the correlation is not significant for those without an agricultural education degree. The data also show a significant low, positive correlation [$r = .45, n = 181, p < .01$] with SBAE teachers with an agricultural education degree between the competence satisfaction and years teaching SBAE, but the correlation is not significant for those without an agricultural education degree. Finally, the data show a significant low but negligible negative correlation [$r = -.22, n = 181, p < .01$] with SBAE teachers with an agricultural education degree between the years teaching SBAE and turnover intention, but the correlation is not significant for those without an agricultural education degree.

Since the requirements for a Minnesota teaching license changed in 2018 to allow additional pathways for a teaching license without completion of a teacher preparation program (Minnesota Professional Educator Licensing and Standards Board, 2021), one factor to examine for this gap may be the much fewer years of teaching for those without a degree in agricultural education who are alternatively licensed. While study participants without an agricultural education degree had an average experience of 3.90 years, research participants with an undergraduate and/or graduate agricultural education degree had an average experience of 13.34 years.

With a growing number of Minnesota SBAE teachers teaching without an agricultural education degree (Sheehan, 2021), additional research is needed to analyze the impact of alternative licensure considering the psychological needs satisfaction of this group of teachers. Furthermore, the impact of choosing SBAE as a second career should also be explored. While the data demonstrate that alternatively certified teachers have their psychological need for competence satisfied, their pathway to licensure results in different expectations for autonomy and relatedness as their teaching license is tied to a specific school district, and they typically haven't built a network within the SBAE community prior to entry into the profession.

Implications for Practice and Further Research

Satisfying SBAE teachers' psychological needs, especially the needs for autonomy and competence, are essential components of Minnesota SBAE teacher retention. The results suggest that psychological need fulfillment at work may be a reliable predictor of professional commitment. These conclusions have implications for those focusing on SBAE teacher retention practices but also for SBAE leaders, school

administrators, and teachers themselves. Although the findings of this study are satisfactory, some recommendations for future research should be examined.

The present research focused on a specific context of Minnesota SBAE teachers. Though the response rate was adequate (Field, 2013; Hair et al., 2014), the generalizability of this study is limited to Minnesota SBAE teachers. Replication studies with other Career and Technical Education teachers or with teachers in a variety of subject areas would add context about teacher psychological needs beyond SBAE teachers. Further replication studies with other SBAE teachers across the United States and with other content areas are needed; therefore, be cautious about generalizing these findings.

Secondly, the conceptual model does not provide any proof of causality. It would be beneficial for future research to test the model and include other types of motivation, as proposed by SDT (e.g., intrinsic motivation; extrinsic motivation). Future research may also consider additional factors which influence motivation and commitment, such as growth mindset, grit, work-life balance, and job satisfaction. The results of this study demonstrate that psychological need fulfillment of autonomy, competence, and relatedness (collectively and independently) predict professional commitment; therefore, each also has implications and recommendations for further research. Given Minnesota SBAE's significant efforts regarding induction, retention, and professional development, further research is needed to investigate these findings fully.

Autonomy

The data from this study confirm that autonomy satisfaction significantly predicted SBAE teacher professional commitment as measured by turnover intention. Prior studies examined the relationship between autonomy satisfaction and teachers'

psychological well-being and discovered that autonomy significantly predicted psychological well-being (Collie et al., 2016; Deci et al., 2001; Nie et al., 2015; Taylor & Ntoumanis, 2007). Specific attention is needed to evaluate the factors which influence autonomy satisfaction. Nie et al. (2015) discovered that teachers' high psychological health and intrinsic motivation were associated with an autonomy-supportive work environment. In contrast to incentives or punishments, experiences of interest and value enhance autonomy by fostering a sense of initiative, acceptance, and ownership in one's actions (Deci & Ryan, 1985, 2000; Ryan & Deci, 2020). Leaders in education and specifically within SBAE in Minnesota can work to create an autonomy-supportive environment that may support the retention of SBAE teachers. Education leaders can consider supporting an autonomy-supportive environment and working with administrators to share the importance of supporting teachers' autonomy fulfillment.

Research is recommended to explore how participation in SBAE-relevant professional development influences autonomy. Additionally, research could explore what SBAE teachers desire in terms of autonomy. What factors influence how SBAE teachers perceive autonomy, and what is promotes or deters autonomy fulfillment? For example, do some teachers desire more support and less autonomy from administration and mentors regarding things like curriculum? Given the flexibility in Minnesota's SBAE curriculum as a local control state, is there a difference in autonomy expectations based on years teaching SBAE or certification type (e.g., do early-career teachers prefer complete curriculum packages such as Curriculum for Agricultural Science Education and less autonomy)? Given Minnesota SBAE leader's focus on induction and retention programming, do specific SBAE professional development programs (e.g., Teacher

Induction Program, Resources for Professional Learning) influence autonomy satisfaction? Does teachers' interest in SBAE professional development programs depend on their level of autonomy satisfaction?

I recommend research be carried out to determine whether any experiential factors influence SBAE teacher autonomy fulfillment. For example, SBAE's student organization, the National FFA Organization, is credited for developing strong leadership skills and critical thinking skills in students. Though not all SBAE teachers were SBAE students and/or participated in FFA, do the skills developed through participation in an SBAE program and/or through FFA participation as a student influence a teacher's expectation for autonomy? Furthermore, given the increase in the number of alternatively certified teachers, is there a difference in autonomy expectations based on certification type (e.g., do alternatively certified teachers prefer a complete, packaged curriculum and less autonomy)? Because autonomy fulfillment is the most significant predictor of professional commitment, more inquiry on SBAE teacher autonomy satisfaction is required.

Competence

According to the findings of this study, competence satisfaction significantly predicted SBAE teacher professional commitment, as indicated by turnover intention. Minnesota SBAE leaders in the Minnesota Association of Agricultural Educators (MAAE), the Minnesota Department of Education, the Minnesota Agricultural Education Leadership Council, and the Minnesota FFA Association have worked together to support SBAE disciple-specific skill development through a variety of professional development. Given the significant correlation between competence fulfillment and SBAE teacher

professional commitment, teachers are encouraged to participate in the opportunities available to develop the skills and knowledge needed for competence fulfillment. Additionally, administrators are encouraged to support SBAE teachers in professional development participation to improve the competence of their teacher while also decreasing the teacher's turnover intention. Finally, SBAE leaders are encouraged to continue providing professional development experiences which fulfill the need for competence.

The ability to manage the special, discipline-specific demands facing an SBAE teacher has been analyzed while evaluating teachers' perceived competency in previous research. SBAE researchers have explored pedagogy, intra-curricular facilitation, program management, technical knowledge, professionalism, professional growth, and personal traits as areas of discipline-specific teacher competence (McKim et al., 2017; Roberts & Dyer, 2004). However, Minnesota has not yet evaluated perceived competence or SBAE teachers' needs for developing discipline-specific competence and skills or if the needs vary by certification type or years teaching SBAE. Need satisfaction for competence had significant differences when considering the teacher life cycle stage. Given these differences and the significance of competence need satisfaction, it is advised that Minnesota SBAE leadership assess needs and evaluate perceived competence, considering certification type and years teaching SBAE, to guide future professional development.

Research is recommended to explore how participation in SBAE-relevant professional development influences competence. Research could also explore how SBAE teachers' competence fulfillment is influenced by professional development

participation and influences teacher choices in the professional development program participation. For example, do specific SBAE professional development programs (e.g., Curriculum for Agricultural Science Education, Teacher Induction Program, MAAE professional development workshops) influence competence? Furthermore, does teachers' interest in SBAE professional development programs depend on their level of competency fulfillment? Further research could also explore the relational factors influencing how SBAE teachers develop competence and if any programs or systems in Minnesota SBAE are promoting or deterring competence fulfillment. Finally, given Minnesota SBAE's retention rates, researchers should consider if these results are consistent within Career and Technical Education in Minnesota, with SBAE in other states, or broadly in education. Because competence fulfillment is important in predicting professional commitment, more inquiry on SBAE teacher competence satisfaction is required.

Relatedness in the School District

Relatedness within the school district was identified as the strongest predictor of professional commitment (Moser & McKim, 2020); however, based on this study, satisfaction for relatedness in the school district is not the most significant factor to predict professional commitment [$r = -.20, n = 181, p < .01$]. However, relatedness satisfaction in the school district is more strongly associated with the intention of female SBAE teachers to leave the profession. Since most early-career SBAE teachers in Minnesota are female, further exploration of this association is warranted.

Relatedness in the SBAE Profession

The *agricultural education family* (Ag Ed family) is consistently mentioned by professional when discussing why teachers choose to stay in the SBAE profession. However, based on these research findings, satisfaction for relatedness in the SBAE profession is not the most significant factor in the model to predict professional commitment. Relatedness in the SBAE profession had a significant but negligible negative correlation [$r = -.19$, $n = 181$, $p < .05$] with turnover intention. Nevertheless, a correlation exists between relatedness (in the school district and the SBAE profession) and professional commitment. When the Ag Ed family is mentioned, it is often in the context of providing reasons to engage in the profession, join the professional organization, and participate in SBAE-relevant professional development. Organization membership and participation in professional development is often a foundational step to professional engagement in SBAE. Therefore, it is logical that those participating in SBAE-relevant professional development are simultaneously improving relatedness fulfillment in the SBAE profession while also improving their competence. Leaders in SBAE should recognize that participation in professional organizations can provide support to satisfy both the psychological need for relatedness and competence. Leaders are encouraged to intentionally provide options to develop the knowledge and skills of SBAE teachers while also supporting relationship development.

Psychological Needs Satisfaction

According to the findings of this study, psychological needs satisfaction at work may be a significant indicator of professional commitment. The findings also indicated that years of teaching experience can be connected to increased psychological needs satisfaction and professional commitment. It should be noted that teachers with fewer

than three years teaching and those with 7-18 years teaching had statistically significant differences in psychological needs satisfaction than those with more than 31 years teaching. Additionally, psychological needs satisfaction and years of teaching can predict a teacher's commitment to the SBAE profession. Therefore, it is recommended that Minnesota SBAE leadership's evaluation of perceived competence and a needs assessment specifically identify the needs of early-career SBAE teachers when working to design future professional development. Beyond year five, teacher attrition in Minnesota reflects declining attrition (Rada & Haddad, 2021). However, when evaluating psychological needs satisfaction, it appears that special effort should determine the unique needs to support teachers with up to 18 years teaching.

Additionally, if leaders in SBAE want to reduce attrition, more must be done to support SBAE teachers' psychological needs satisfaction of autonomy, competence, and relatedness while also analyzing the potential unique needs of alternatively licensed teachers. The association between psychological needs satisfaction and professional commitment was statistically significant regardless of having an agricultural education degree, but an unexpected finding was a greater, negative correlation for SBAE teachers without an agricultural education degree (i.e., alternatively licensed). To learn more about how licensure pathways affect psychological needs fulfillment and professional commitment, I encourage future study in this area. I suggest that the study be replicated every five years because Minnesota's licensure pathways have changed in recent years (i.e., 2018), providing opportunities for licensure without completing a teacher preparation program or earning an agricultural education bachelor's or master's degree (i.e., alternative licensure via Tier 1, Tier 2, or out of field permission). Additional

research is needed to consider the unique factors of psychological needs satisfaction of alternatively licensed teachers.

This study provided a foundation for exploring how psychological needs satisfaction influences professional commitment as determined by turnover intention. Further research is recommended to further identify the factors in SBAE which influence autonomy satisfaction, competence satisfaction, and relatedness satisfaction within the school district and the SBAE profession. Additionally, this study provided a snapshot at one point in time; however, replication would provide additional evidence concerning the relationship between years of experience and other variables. A replication of this study could provide crucial information to inform the factors that influence turnover intention and actual attrition over time during a critical phase in a participant's career, as 39.2% of the study's participants had five or fewer years teaching SBAE and an additional 17.1% had six to ten years of teaching experience.

Conclusion

This study viewed psychological needs through the lens of SDT (Ryan & Deci, 2002), recognizing that the psychological needs of autonomy, competence, and relatedness are universal and innate needs essential for psychological functioning (Ryan & Deci, 2020). People are drawn to environments that foster needs satisfaction, and that needs satisfaction influences beliefs and behaviors (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016), psychological needs satisfaction influences teachers' professional commitment. The purpose of this study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness was related to and could predict teacher's professional commitment.

According to the study's findings, it was confirmed that satisfaction of psychological needs at work was a good indicator of professional commitment as measured by turnover intention. This study supports earlier research (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016), which found people are drawn to environments that foster needs satisfaction, needs satisfaction influences beliefs and behaviors, and teachers' psychological needs fulfillment influences a teacher's intentions to remain in the profession. The data provide evidence demonstrating autonomy and competence needs fulfillment had the strongest relationship with professional commitment as measured by turnover intention. The results also yielded evidence that years of teaching experience can predict improved psychological needs satisfaction and professional commitment. Psychological needs satisfaction and years teaching contribute to professional commitment of SBAE teachers in Minnesota.

The most important conclusion is that psychological needs satisfaction is relevant to the discussion of SBAE teacher retention, while needs satisfaction of autonomy and competence were more significantly linked with decreased turnover intention. As in previous studies, the results of this research affirm that the focus on early-career SBAE teachers was necessary as teachers with additional years of experience have more psychological functioning.

The study's results establish that psychological needs fulfillment of SBAE teachers at work is a reliable predictor of professional commitment. People are drawn to environments that support psychological needs satisfaction, which influences beliefs and behaviors such as the intention to remain in the profession. The data establish that, when measured by turnover intention, professional commitment of SBAE teachers is supported

by psychological needs satisfaction., and most strongly predicted by satisfaction of autonomy and competence needs. The findings also affirm that increased psychological needs satisfaction and professional commitment were connected to years of teaching experience. The data verify that psychological needs satisfaction predicted professional commitment of Minnesota SBAE teachers.

References

- Agricultural Experience Tracker (2022). *2022 Teacher Profile*.
[https://www.theaet.com/docs/2022%20teacher%20profile%20\(1\).pdf](https://www.theaet.com/docs/2022%20teacher%20profile%20(1).pdf)
- Albrecht, S. L., & Marty, A. (2017). Personality, self-efficacy and job resources and their associations with employee engagement, affective commitment and turnover intentions. *The International Journal of Human Resource Management*, *31*(5), 657-681. <https://doi.org/10.1080/09585192.2017.1362660>
- Allen, N. J., & Meyer, J. P. (1996). Affective, continuance, and normative commitment to the organization: An examination of construct validity. *Journal of vocational behavior*, *49*(3), 252-276. <https://doi.org/10.1006/jvbe.1996.0043>
- Baard, P. P. (2002). Intrinsic Need Satisfaction in Organizations: A Motivational Basis of Success in For-Profit. *Handbook of Self-determination Research*, 255-275.
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, *34*, 2045–2068. <https://doi.org/10.1111/j.1559-1816.2004.tb02690.x>
- Bartholomew, K. J., Ntoumanis, N., Cuevas, R., & Lonsdale, C. (2014). Job pressure and ill-health in physical education teachers: The mediating role of psychological need thwarting. *Teaching and Teacher Education*, *37*, 101–107.
<https://doi.org/10.1016/j.tate.2013.10.006>
- Bergmann, T. J., Lester, S. W., De Meuse, K. P., & Grahn, J. L. (2000). Integrating the three domains of employee commitment: An exploratory study. *Journal of Applied Business Research*, *16*(4). <https://doi.org/10.19030/jabr.v16i4.2050>

- Bitsadze, M., & Japaridze, M. (2014). Personal and social aspects of teacher burnout in Georgia. *Problems of Education in the 21st Century*, 59, 7-14.
<https://doi.org/10.33225/pec/14.59.07>
- Blackburn, J. J., & Robinson, J. S. (2008). Assessing teacher self-efficacy and job satisfaction of early career agriculture teachers in Kentucky. *Journal of Agricultural Education*, 49(3), 1-11. <https://doi.org/10.5032/jae.2008.03001>
- Blau, G. J. (1985). The measurement and prediction of career commitment. *Journal of Occupational Psychology*, 58(4), 277-288. <https://doi.org/10.1111/j.2044-8325.1985.tb00201.x>
- Blau, G. J. (1988). Further exploring the meaning and measurement of career commitment. *Journal of Vocational Behavior*, 32(3), 284-297.
[https://doi.org/10.1016/0001-8791\(88\)90020-6](https://doi.org/10.1016/0001-8791(88)90020-6)
- Blau, G. J., & Boal, K. B. (1987). Conceptualizing how job involvement and organizational commitment affect turnover and absenteeism. *Academy of management review*, 12(2), 288-300. <https://doi.org/10.5465/amr.1987.4307844>
- Boone, H. N., & Boone, D. A. (2007). Problems faced by high school agricultural education teachers. *Journal of Agricultural Education*, 48(2), 36-45.
<https://doi.org/10.5032/jae.2009.01021>
- Bouwma-Gearhart, J. (2010). Pre-service educator attrition informed by self-determination theory: Autonomy loss in high-stakes education environments. *Problems of Education in the 21st Century*, 26, 30.
- Byrd, A. P., Anderson, R. G., Paulsen, T. H., & Schultz, M. J. (2015). Does the number of post-secondary agricultural mechanics courses completed affect teacher

competence? *Journal of Agricultural Education*, 56(1), 20-31. doi:
10.5032/jae.2015.01020

Camman, C., Fichman, M., Jenkins, G. D., & Klesh, J. (1983). Michigan Organizational Assessment Questionnaire. In S. E. Seashore, E. E. Lawler, P. H. Mirvis, & C. Camman (Eds.), *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71–138). Wiley.

Certo, J. L., & Fox, J. E. (2002). Retaining Quality Teachers. *The High School Journal*, 86(1), 57-75. doi:10.1353/hsj.2002.0015

Chaney, C. A. (2007). *Work-life variables influencing attrition among beginning agriscience teachers of Texas* (Doctoral dissertation). Retrieved from <http://hdl.handle.net/1969.1/5950>

Chapman, D. W. (1983). A model of the influences on teacher retention. *Journal of Teacher Education*, 34(5), 43-49. <https://doi.org/10.1177/002248718303400512>

Chenevey, J. L., Ewing, J. C., & Whittington, M. S. (2008). Teacher burnout and job satisfaction among agricultural education teachers. *Journal of Agricultural Education*, 49(3), 12-22. <https://doi.org/10.5032/jae.2008.03012>

Chirkov, V., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, 84(1), 97-110. <https://doi.org/10.1037/0022-3514.84.1.97>

Clark, M. S., Kelsey, K. D., & Brown, N. R. (2014). The thornless rose: A phenomenological look at decisions career teachers make to remain in the

profession. *Journal of Agricultural Education*, 55(3), 43-56.

<https://doi.org/10.5032/jae.2014.03043>

Clemons, C. A., Heidenrich, A. E., & Linder, J. R. (2018). Assessing the technical expertise and content needs of Alabama agriscience teachers. *Journal of Agricultural Education*, 59(3), 87-99

<https://doi.org/10.5032/jae.2018.03087>

Clemons, C. A., & Lindner, J. R. (2019). Teacher longevity and career satisfaction in the secondary agricultural education classroom. *Journal of Agricultural Education*,

60(1), 186-201. <https://doi.org/10.5032/jae.2019.01186>

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: L. Erlbaum Associates.

Coleman, B., Bunch, J., and Thoron, A. (2020). Identifying agriscience teachers'

instructional practice professional development needs by certification

type. *Journal of Agricultural Education*, 61(3), 86-

100. <https://doi.org/10.5032/jae.2020.03086>

Colledani, D., Capozza, D., Falvo, R., & Di Bernardo, G. A. (2018). The work-related basic need satisfaction scale: an Italian validation. *Frontiers in psychology*, 9,

1859. <https://doi.org/10.3389/fpsyg.2018.01859>

Collie, R. J., Granziera, H., & Martin, A. J. (2018). Teachers' perceived autonomy support and adaptability: An investigation employing the job demands-resources

model as relevant to workplace exhaustion, disengagement, and

commitment. *Teaching and Teacher Education*, 74, 125-136.

<https://doi.org/10.1016/j.tate.2018.04.015>

- Collie, R. J., Shapka, J. D., Perry, N. E., & Martin, A. J. (2016). Teachers' psychological functioning in the workplace: Exploring the roles of contextual beliefs, need satisfaction, and personal characteristics. *Journal of Educational Psychology, 108*, 788-799. <https://doi.org/10.1037/edu0000088>.
- Coolidge, F. L. (2013). *Statistics: A gentle introduction*. SAGE Publications.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
- Crutchfield, N., Ritz, R., & Burris, S. (2013). Why agricultural educators remain in the classroom. *Journal of Agricultural Education, 54*(2), 1-14.
doi:10.5032/jae.2013.02001
- Darling-Hammond, L., & Sykes, G. (2003). Wanted, a national teacher supply policy for education: The right way to meet the "highly qualified teacher" challenge. *Education Policy Analysis Archives, 11*(33), 1-55.
<https://doi.org/10.14507/epaa.v11n33.2003>
- Day, C. (2008). Committed for life? Variations in teachers' work, lives and effectiveness. *Journal of Educational Change, 9*(3), 243-260. doi:210.1007/s10833-10007-19054-10836
- Day, C., Elliot, B., & Kington, A. (2005). Reform, standards and teacher identity: Challenges of sustaining commitment. *Teaching and Teacher Education, 21*(5), 563-577. <https://doi.org/10.1016/j.tate.2005.03.001>
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. Academic Press.

- Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. *Plenum*. <https://doi.org/10.1007/978-1-4899-2271-7>
- Deci, E. L., & Ryan, R. M. (1995). Human Autonomy. In: Kernis M.H. (eds) *Efficacy, Agency, and Self-Esteem. The Springer Series in Social Clinical Psychology*. Springer. https://doi-org.ezp3.lib.umn.edu/10.1007/978-1-4899-1280-0_3
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227-268. https://doi.org/10.1207/s15327965pli1104_01
- Deci, E. L., & Ryan, R. M. (2002). Self-determination research: Reflections and future directions. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 431–441). University of Rochester Press.
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 85-110). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780195399820.013.0006>
- Deci, E. L., & Ryan, R. M. (2014). The importance of universal psychological needs for understanding motivation in the workplace. In M. Gagne (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp 13-32). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199794911.001.0001>
- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-

determination. *Personality and Social Psychology Bulletin*, 27(8), 930-942.

<https://doi.org/10.1177/0146167201278002>

Deci, E. L., Spiegel, N. H., Ryan, R. M., Koestner, R., & Kauffman, M. (1982). Effects of performance standards on teaching styles: Behavior of controlling teachers. *Journal of Educational Psychology*, 74, 852–859. <https://doi.org/10.1037/0022-0663.74.6.852>

DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Sage Publications.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. New York: Wiley and Sons.

Eck, C., Layfield, K., DiBenedetto, C., & Gore, J. (2021). School-based agricultural education teachers' competence of synchronous online instruction tools during the COVID-19 pandemic. *Journal of Agricultural Education*, 62(2), 137-147. <http://doi.org/10.5032/jae.2021.02137>

Education Minnesota. (2021, April 22). *Tiered Licensure in Minnesota*.

https://www.educationminnesota.org/wp-content/uploads/2021/08/2021_TieredLicensure_Infographic.pdf

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage Publications.

Firestone, W. A., & Pennell, J. R. (1993). Teacher commitment, working conditions, and differential incentive policies. *Review of Educational Research*, 63(4), 489-525.

<https://doi.org/10.3102/00346543063004489>

- Foster, D. D., Lawver, R. G., & Smith, A. R. (2020). *National Agricultural Education Supply and Demand Study, 2019 Executive Summary*. Retrieved from:
<http://aaaeonline.org/Resources/Documents/NS D2019Summary.pdf>
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*(4), 331-362.
<https://doi.org/10.1002/job.322>
- Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly, 73*(2), 349-360. <https://doi.org/10.1093/poq/nfp031>
- Garson, G. D. (2012). *Testing statistical assumptions* (2012 ed.). G. David Garson and Statistical Associates Publishing.
<http://www.statisticalassociates.com/assumptions.pdf>
- Giffords, E. D. (2009). An examination of organizational commitment and professional commitment and the relationship to work environment, demographic and organizational factors. *Journal of Social Work, 9*(4), 386-404.
<https://doi.org/10.1177/1468017309346232>
- Gorter, E. K. (2018). *Exploration of global perspectives, teacher passion, and professional commitment of second stage agriculture teachers in the Western United States* (Order No. 13839859) [Doctoral dissertation, Texas A&M University]. ProQuest Dissertations Publishing.
- Gray, L., & Taie, S., & O'Rear, I. (2015). Public School Teacher Attrition and Mobility in the First Five Years: Results from the First through Fifth Waves of the 2007-08

- Beginning Teacher Longitudinal Study. First Look. NCES 2015-337. *National Center for Education Statistics*. <https://nces.ed.gov/pubs2015/2015337.pdf>
- Greguras, G. J., & Diefendorff, J. M. (2009). Different fits satisfy different needs: linking person-environment fit to employee commitment and performance using self-determination theory. *Journal of Applied Psychology, 94*(2), 465. <https://doi.org/10.1037/a0014068>
- Greiman, B. C. (2010). Continuing professional development. In R. Torres, T. Kitchel, & A. Ball (Eds.), *Preparing and advancing teachers in agricultural education* (pp. 181-200). Curriculum Materials Service, The Ohio State University.
- Hainline, M. S., Ulmer, J. D., Ritz, R. R., Burris, S., & Gibson, C. D. (2015). Career and family balance of Texas agricultural science teachers by gender. *Journal of Agricultural Education, 56*(4), 31-46. doi: 10.5032/jae.2015.04031
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis: Pearson new international edition*. Pearson Education Limited.
- Hasselquist, L., Herndon, K., & Kitchel, T. (2017). School culture's influence on beginning agriculture teachers' job satisfaction and teacher self-efficacy. *Journal of Agricultural Education, 58*(1), 267-279. <https://doi.org/10.5032/jae.2017.01267>
- Hobson, A. J., & Maxwell, B. (2017). Supporting and inhibiting the well-being of early career secondary school teachers: Extending self-determination theory. *British Educational Research Journal, 43*(1), 168-191. <https://doi.org/10.1002/berj.3261>
- Huberman, M. (1989). The professional life cycle of teachers. *Teachers College Record, 91*, 31- 57. <https://doi.org/10.1177/016146818909100107>

- Jackson, S. L. (2015). *Research methods and statistics: A critical thinking approach*. Cengage Learning.
- Jacob, A., Vidyarthi, E., & Carroll, K. (2012). The irreplaceables: Understanding the real retention crisis in America's urban schools. *TNTP*. Retrieved from https://tntp.org/assets/documents/TNTP_Irreplaceables_2012.pdf
- Joerger, R. M. (2002). A comparison of the inservice education needs of two cohorts of beginning Minnesota agricultural education teachers. *Journal of Agricultural Education*, 43(3), 11-24. <https://doi.org/10.5032/jae.2002.03011>
- Joerger, R. M., & Boettcher, G. (2000). A description of the nature and impact of teaching events and forms of beginning teacher assistance as experienced by Minnesota agricultural education teachers. *Journal of Agricultural Education*, 41(4), 104-115. <https://doi.org/10.5032/jae.2000.04104>
- Johnson, D. M., & Shoulders, C. W. (2017). Power of statistical tests used to address nonresponse error in the Journal of Agricultural Education. *Journal of Agricultural Education*, 58(1), 300-312. <https://doi.org/10/5032/jae.2017.01300>
- Johnson, R. B., & Christensen, L. (2014). *Educational research: Quantitative, qualitative, and mixed approaches*. SAGE Publications, Incorporated.
- Jotkoff, E. (2022, February 1). *NEA survey: Massive staff shortages in schools leading to educator burnout; alarming number of educators indicating they plan to leave profession*. National Education Association. <https://www.nea.org/about-nea/media-center/press-releases/nea-survey-massive-staff-shortages-schools-leading-educator>

- Kauffman, D., Moore Johnson, S., Kardos, S. M., Liu, E., & Peske, H. G. (2002). "Lost at Sea": New teachers' experiences with curriculum and assessment. *Teachers College Record, 104*(2), 273-300. <https://doi.org/10.1177/016146810210400202>
- Klassen, R. M., Perry, N. E., & Frenzel, A. C. (2012). Teachers' relatedness with students: An underemphasized component of teachers' basic psychological needs. *Journal of Educational Psychology, 104*(1), 150-165. <https://doi.org/10.1037/a0026253>
- Konovsky, M. A., & Cropanzano, R. (1991). Perceived fairness of employee drug testing as a predictor of employee attitudes and job performance. *Journal of Applied Psychology, 76*(5), 698. <https://doi.org/10.1037/0021-9010.76.5.698>
- Lawver, R. G., & Smith, K. L. (2014). Coping mechanisms Utah agriculture teachers use to manage teaching related stress. *Journal of Agricultural Education, 55*(1), 76-91. doi: 10.5032/jae.2014.01076
- Lee, A. N., & Nie, Y. (2014). Understanding teacher empowerment: Teachers' perceptions of principal's and immediate supervisor's empowering behaviours, psychological empowerment and work-related outcomes. *Teaching and Teacher Education, 41*, 67-79. <https://doi.org/10.1016/j.tate.2014.03.006>
- Lemons, L. L., Brashears, M. T., Burris, S., Meyers, C., & Price, M. A. (2015). Factors contributing to attrition as reporters by leavers of secondary agriculture programs. *Journal of Agricultural Education, 56*(4), 17-30. <https://doi.org/10.5032/jae.2015.04017>

- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education, 42*(4), 43-53.
<https://doi.org/10.5032/jae.2001.04043>
- Louis, K. S. (1998). Effects of teacher quality of work life in secondary schools on commitment and sense of efficacy. *School Effectiveness and School Improvement, 9*(1), 1-27. <https://doi.org/10.1080/0924345980090101>
- Mabekeje, S. O., Azeez, O., Okunuga, O. O., & Bamgbose, A. O. (2016). Does basic work needs satisfaction mediate between psychological empowerment and career commitment of teachers?. *Academic Journal of Interdisciplinary Studies, 5*(3), 187. <https://doi.org/10.5901/ajis.2016.v5n3p187>
- Maslach, C., & Jackson, S. E. (1981). *MBI: Maslach burnout inventory*. Consulting Psychologists Press.
- Mauss, I. B., Shallcross, A. J., Troy, A. S., John, O. P., Ferrer, E., Wilhelm, F. H., & Gross, J. J. (2011). Don't hide your happiness! Positive emotion dissociation, social connectedness, and psychological functioning. *Journal of Personality and Social Psychology, 100*(4), 738. <https://doi.org/10.1037/a0022410>
- McKim, A. J., Sorensen, T. J., Velez, J. J., & Henderson, T. M. (2017). Analyzing the relationship between four teacher competence areas and commitment to teaching. *Journal of Agricultural Education, 58*(4), 1-14.
<https://doi.org/10.5032/jae.2017.04001>
- McKim, A. J., & Velez, J. J. (2015). Exploring the relationship between self-efficacy and career commitment among early career agriculture teachers. *Journal of Agricultural Education, 56*(1), 127-140. <https://doi.org/10.5032/jae.2015.01127>

- Meyer, J. P. (2014). Employee commitment, motivation, and engagement: Exploring the links. In M. Gagne (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp 33-49). Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199794911.013.005>
- Miller, L. E., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21(5), 45-50.
- Minnesota Credit Equivalencies, Minnesota Statute § 120B.024 (2019). *2022 Minnesota Statutes*. <https://www.revisor.mn.gov/statutes/cite/120B.024>
- Minnesota Professional Educator Licensing and Standards Board. (2021). *2021 biennial report: Supply and demand of teachers in Minnesota*. St. Paul, MN: PELSB.
https://mn.gov/pelsb/assets/Supply%20and%20Demand%202021_Final_tcm1113-463801.pdf.
- Moser, E., & McKim, A. (2020). Teacher retention: A relational perspective. *Journal of Agricultural Education*, 61(2), 263-275. <https://doi.org/10.5032/jae.2020.02263>
- Murray, K., Flowers, J., Croom, B., & Wilson, B. (2011). The agricultural teacher's struggle for balance between career and family. *Journal of Agricultural Education*, 52(2), 107-117. <https://doi.org/10.5032/jae.2011.02107>
- National Center for Education Statistics. (2018). *Digest of education statistics. Public and private elementary and secondary teachers, enrollment, pupil-teacher ratios, and new teacher hires: Selected years, fall 1955 through fall 2027*. Washington, DC: U.S. Department of Education.
https://nces.ed.gov/programs/digest/d17/tables/dt17_208.20.asp?current=yes
(accessed 12/16/18).

- National FFA Organization. (2020). *What is FFA?* <http://www.ffa.org/about/what-is-ffa>
- Ni, Y. (2017). Teacher working conditions, teacher commitment, and charter schools. *Teachers College Record*, 119(6), 1-38.
<https://doi.org/10.1177/016146811711900606>
- Nie, Y., Chua, B. L., Yeung, A. S., Ryan, R. M., & Chan, W. Y. (2015). The importance of autonomy support and the mediating role of work motivation for well-being: Self-determination theory in a Chinese work organization. *International Journal of Psychology*, 50(4), 245–255. <https://doi.org/10.1002/ijop.12110>
- Nias, J. (1981). ‘Commitment’ and motivation in primary school teachers. *Educational Review*, 33(3), 182-190. <https://doi.org/10.1080/0013191810330302>
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.
- Palmer, C. B. (2020). *The relationship between autonomy, competence, and relatedness and teachers’ length of service* (Order No. 27996038). Available from ProQuest Dissertations & Theses Global. (2416832992).
- Park, J. H., Cooc, N., & Lee, K. H. (2020). Relationships between teacher influence in managerial and instruction-related decision-making, job satisfaction, and professional commitment: A multivariate multilevel model. *Educational Management Administration & Leadership*, (51)1, 116–137.
<https://doi.org/10.1177/17411432209712>
- Pelletier, L. G., Séguin- Lévesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching

behavior. *Journal of Educational Psychology*, 94, 186–196.

<https://doi.org/10.1037/0022-0663.94.1.186>

Phillips, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Pink, D. (2009). *Drive: The surprising truth about what motivates us*. Riverhead Books.

<https://doi.org/10.1002/casp.1085>

Podolsky, A., Kini, T., Bishop, J., & Darling-Hammond, L. (2016). Solving the teacher shortage: How to attract and retain excellent educators. *Learning Policy Institute*.

Rada, L. L. (2022, March/April). Mentorship matters. *The Agricultural Education Magazine*, 94(5), 20-22.

https://www.naae.org/profdevelopment/magazine/archive_issues/Volume94/2022%2003%20--%20March%20April.pdf

Rada, L. L., & Haddad, B. (2021). Balancing demand: Reevaluating SBAE teacher supply and demand in [State]. *Proceedings of the North Central Region of the American Association for Agricultural Education Conference*, Columbus, OH.

<http://aaaeonline.org/resources/Documents/North%20Central/2021Conference/2021NorthCentralResearchProceedings.pdf>

Raju, P. M., & Srivastava, R. C. (1994). Factors contributing to commitment to the teaching profession. *International Journal of Educational Management*, 8(5), 7-

13. <https://doi.org/10.1108/09513549410065684>

Revilla, M., & Ochoa, C. (2017). Ideal and maximum length for a web survey. *International Journal of Market Research*, 59(5), 557-565.

<https://doi.org/10.2501/IJMR-2017-0>

- Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education*, 45(4), 82-95.
<https://doi.org/10.5032/jae.2004.04082>
- Ronen, S., & Mikulincer, M. (2014). The foundation of autonomous motivation in the workplace: An attachment perspective. In Gagne, M. (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp 109-126). New York: Oxford University Press.
- Ruhland, S. K., & Bremer, C. D. (2002). *Alternative teacher certification procedures and professional development opportunities for career and technical education teachers*. St. Paul, MN: The National Research Center for Career and Technical Education. Retrieved from <https://files.eric.ed.gov/fulltext/ED472438.pdf>
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.
<https://doi.org/10.1006/ceps.1999.1020>
- Ryan, R. M., & Deci, E. L. (2002). Overview of self-determination theory: An organismic dialectical perspective. In E. L. Deci, & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 3–33). Rochester, NY: The University of Rochester Press.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.
- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future

directions. *Contemporary Educational Psychology*.

<https://doi.org/10.1016/j.cedpsych.2020.101860>

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: An organismic perspective on the nature of goals and their regulation. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 7–26). The Guilford Press.

Ryan, R. M., Vansteenkiste, M., & Soenens, B. (2019). Reflections on self-determination theory as an organizing framework for personality psychology: Interfaces, integrations, issues, and unfinished business. *Journal of Personality*, 87(1), 115–145. <https://doi.org/10.1111/jopy.12440>

Sammons, P., Day, C., Kington, A., Gu, Q., Stobart, G., & Smees, R. (2007). Exploring variations in teachers' work, lives and their effects on pupils: Key findings and implications from a longitudinal mixed-method study. *British Educational Research Journal*, 33(5), 681-701. doi:610.1080/01411920701582264

Santoro, D. A. (2013). “I was becoming increasingly uneasy about the profession and what was being asked of me”: Preserving integrity in teaching. *Curriculum inquiry*, 43(5), 563-587. <https://doi.org/10.1111/curi.12027>

Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia and Analgesia*, 126(5), 1763-1768. doi:10.1213/ANE.0000000000002864

Sheehan, C. Z. (2020, September 24). *Minnesota AFNR Update* [Presentation]. Minnesota Agricultural Education Leadership Council Government Meeting, virtual.

- Sheehan, C. Z. (2021). Minnesota Agriculture, Food and Natural Resources Update. *Ag in Action, Winter 2021, 6-7*.
https://www.dropbox.com/s/3jfycksuizlr4t/AIA_W21_website.pdf?dl=0
- Sheehan, C. Z. (2022, September 22). *Minnesota AFNR Update* [Presentation]. Minnesota Agricultural Education Leadership Council Government Meeting, virtual.
- Shore, L. M., Newton, L. A., & Thornton III, G. C. (1990). Job and organizational attitudes in relation to employee behavioral intentions. *Journal of Organizational Behavior, 11*(1), 57-67. <https://doi.org/10.1002/job.4030110108>
- Singh, K., & Billingsley, B. S. (1996). Intent to stay in teaching: Teachers of students with emotional disorders versus other special educators. *Remedial and Special Education, 17*(1), 37-47. <https://doi.org/10.1177/074193259601700105>
- Smalley, S., Hainline, M. S., & Sands, K. (2019). School-based agricultural education teachers' perceived professional development needs associated with teaching, classroom management, and technical agriculture. *Journal of Agricultural Education, 60*(2), 85-98. doi: 10.5032/jae.2019.02085
- Smalley, S. W., Smith, A. R. (2017). Professional development needs of mid-career agriculture teachers. *Journal of Agricultural Education, 58*(4) 282-290.
<https://doi.org/10.5032/jae.2017.04282>
- Smith, A. R., & Smalley, S. (2018). Job stress, burnout, and professional development needs of mid-career agricultural education teachers. *Journal of Agricultural Education, 59*(2), 305-320 <https://doi.org/10.5032/jae.2018.02305>

- Solomonson, J. K., Korte, D. S., Thieman, E. B., Retallick, M. S., & Keating, K. H. (2018). Factors contributing to Illinois school-based agriculture teachers' final decision to leave the classroom. *Journal of Agricultural Education, 59*(2), 321. <https://doi.org/10.5032/jae.2018.02321>
- Solomonson, J. K., & Retallick, M. S. (2018). Over the edge: Factors nudging mid-career, school-based agriculture teachers out of the profession. *Journal of Agricultural Education, 59*(4), 1-19. <https://doi.org/10.5032/jae.2018.04001>
- Solomonson, J., Still, S., & Maxwell, L. (2021). Factors influencing the decision of Illinois school-based agricultural education teachers to remain in the profession. *Journal of Agricultural Education, 62*(3), 121-137. <https://doi.org/10.5032/jae.2021.03121>
- Somech, A., & Bogler, R. (2002). Antecedents and consequences of teacher organizational and professional commitment. *Educational Administration Quarterly, 38*(4), 555-577. <https://doi.org/10.1177/001316102237672>
- Sorensen, T. J., & McKim, A. J. (2014). Perceived work-life balance ability, job satisfaction, and professional commitment among agriculture teachers. *Journal of Agricultural Education, 55*(4), 116-132. <https://doi.org/10.5032/jae.2014.04116>
- Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016a). A national study of work-family balance and job satisfaction among agriculture teachers. *Journal of Agricultural Education, 57*(4), 146-159. <https://doi.org/10.5032/jae.2016.04146>
- Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016b). Why agriculture teachers leave: A national examination of turnover intentions and work-family conflict. *Journal of Agricultural Education, 57*(4), 186-201. <https://doi.org/10.5032/jae.2016.04186>

- Stockemer, D. (2019). *Quantitative methods for the social sciences*. Springer International Publishing.
- Stone, D., Deci, E., & Ryan, R. (2009). Beyond talk: Creating autonomous motivation through self-determination theory. *Journal of General Management, 34*(3), 75-91. <https://doi.org/10.1177/030630700903400305>
- Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Washington, DC: Learning Policy Institute. <https://doi.org/10.54300/247.242>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics*. Pearson.
- Taylor, I. M., & Ntoumanis, N. (2007). Teacher motivational strategies and student self-determination in physical education. *Journal of Educational Psychology, 99*(4), 747. <https://doi.org/10.1037/0022-0663.99.4.747>
- Tippens, A., Ricketts, J. C., Morgan, A. C., Navarro, M., & Flanders, F. B. (2013). Factors related to teachers' intention to leave the classroom early. *Journal of Agricultural Education, 54*(4), 58-72. <https://doi.org/10.5032/jae.2013.04058>
- Touchstone, A. J. L. (2015). Professional development needs of beginning agricultural education teachers in Idaho. *Journal of Agricultural Education, 56*(2), 170-187. <https://doi.org/10.5032/jae.2015.022170>
- Tsui, K. T., & Cheng, Y. C. (1999). School organizational health and teacher commitment: A contingency study with multi-level analysis. *Educational Research and Evaluation, 5*(3), 249-268. <https://doi.org/10.1076/edre.5.3.249.3883>

- Van den Broeck, A., Ferris, D. L., Chang, C. H., & Rosen, C. C. (2016). A review of self-determination theory's basic psychological needs at work. *Journal of Management*, 42(5), 1195-1229. <https://doi.org/10.1177/0149206316632058>
- Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83(4), 981-1002. <https://doi.org/10.1348/096317909x481382>
- Vandenberghe, C., & Bentein, K. (2009). A closer look at the relationship between affective commitment to supervisors and organizations and turnover. *Journal of Occupational and Organizational Psychology*, 82(2), 331-348. <https://doi.org/10.1348/096317908x312641>
- Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic psychological need theory: Advancements, critical themes, and future directions. *Motivation and Emotion*, 44, 1–31. <https://doi.org/10.1007/s11031-019-09818-1>
- Vincent, S. K., & Torres, R. M. (2015). Multicultural competence: A case study of teachers and their student perceptions. *Journal of Agricultural Education*, 56(2), 64-75. doi: 10.5032/jae.2015.02064
- Wells, T., Hainline, M., Rank, B., Sanders, K., & Chumbley, S. (2021). A regional study of the agricultural mechanics knowledge and skills needed by school-based agricultural education teachers. *Journal of Agricultural Education*, 62(2), 148-166. <http://doi.org/10.5032/jae.2021.02148>

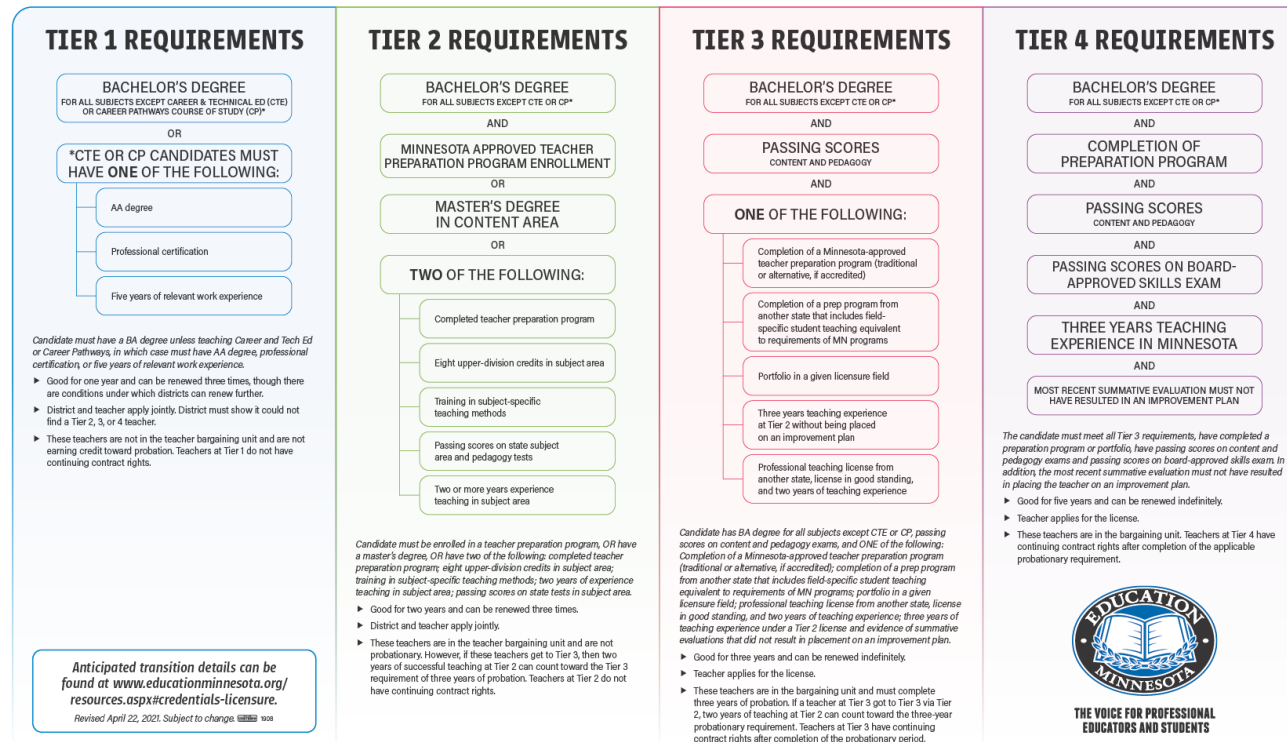
- Wheeler, J., & Knobloch, N. A. (2006). *Relationship of teacher and program variables to beginning agriculture teachers' sense of efficacy*. Proceedings of the National Agricultural Education Research Conference, Charlotte, NC, 33, 590-600.
- Will, M. (2021, September 14). *Teachers are not ok, even though we need them to be*. Education Week. <https://www.edweek.org/teaching-learning/teachers-are-not-ok-even-though-we-need-them-to-be/2021/09>
- Wisniewski, T., Sohel, S., Perry, N. E., White, C., Green, C., Shapka, J. D., & Elder, A. F. (2018). Supporting students through role redefinition: A self-determination theory perspective. *Education as Change*, 22(1), 1–23.
<https://doi.org/10.25159/1947-9417/3700>
- Yilmaz, K., Altinkurt, Y., & Guner, M. (2015). The relationship between teachers' emotional labor and burnout level. *Eurasian Journal of Educational Research*, 15(59), 75-90. <https://doi.org/10.14689/ejer.2015.59.5>

Appendices

Appendix A

Minnesota Tiered Licensure Summary

Tiered licensure in Minnesota



THE VOICE FOR PROFESSIONAL EDUCATORS AND STUDENTS

Note. Minnesota's tiered licensure system outlining requirements for Tier 1, Tier 2 (i.e., alternatively licensed teachers), Tier 3 and Tier 4 (traditionally licensed teachers). From "Tiered Licensure in Minnesota," by Education Minnesota (2021, April 22) (https://www.educationminnesota.org/wp-content/uploads/2021/08/2021_TieredLicensure_Infographic.pdf)

Appendix B

Permission for W-BNS and MOAQ-JSS

Work-related Basic Need Satisfaction Scale External Inbox x ✕ 🖨 🔗

Lavyne Rada <rada@umn.edu>
to anja.vandenbroeck@kuleuven.be, bcc: me ▾

Fri, Oct 16, 2020, 11:12 PM ☆ ↶ ⋮

Hello,

I am a doctoral student in Curriculum and Instruction in Agricultural Education at the University of Minnesota working on my dissertation about novice teacher retention. Your contribution to the field of need satisfaction is inspiring and much appreciated. I would greatly appreciate it if you would send me a copy of the most current version of the Work-related Basic Need Satisfaction scale and interpretation guide? Also, if you have anything about the scale being validated in English, that would also be greatly appreciated.

Thank you for your help,

Lavyne

Lavyne Rada
PhD Student, STEM Education, AFNR Education
University of Minnesota
(605) 695-1861
rada@umn.edu

Anja Van den Broeck <vandenbroeck.anja@gmail.com>
to me ▾

📧 Tue, Oct 20, 2020, 9:18 AM ☆ ↶ ⋮

Hi,

The scale was validated in Dutch, but has been successfully used in English. I'm sending all the materials along!

Good luck!

Anja

MOAQ Permission External  Inbox x



Lavyne Rada <rada@umn.edu>
to mf4f@andrew.cmu.edu, bcc: me ▾

Sat, Oct 17, 2020, 9:44 PM ☆ ↶ ⋮

Greetings Dr. Fichman,

I am a doctoral student in Curriculum and Instruction in Agricultural Education at the University of Minnesota working on my dissertation about novice teacher retention. Your contribution to the field of employee retention is inspiring and much appreciated. I would greatly appreciate it if I could use the Michigan Organizational Assessment Questionnaire (MOAQ) that you authored. Would you please grant permission to use the questionnaire and send me a copy of the most current version?

Thank you for your help and consideration,
Lavyne

Lavyne Rada
PhD Student, STEM Education, AFNR Education
University of Minnesota
(605) 695-1861
rada@umn.edu

Mark Fichman <mf4f@cmu.edu>
to me ▾

 Sun, Oct 18, 2020, 9:12 AM ☆ ↶ ⋮

Hi,

Thanks for the kind words. You have my permission to use the questionnaire. I attach the chapter describing the questionnaire. If you have any questions, feel free to ask.

Mark Fichman

Appendix C

IRB Approval Letter

UNIVERSITY OF MINNESOTA

Twin Cities Campus

*Human Research Protection Program
Office of the Vice President for Research*

*Room 350-2
McNamara Alumni Center
200 Oak Street S.E.
Minneapolis, MN 55455
612-626-5654
irb@umn.edu
<https://research.umn.edu/units/irb>*

EXEMPTION DETERMINATION

February 16, 2021

Amy Smith

563-210-0223
arsmith@umn.edu

Dear Amy Smith:

On 2/16/2021, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The Relationship Between Intrinsic Motivation Factors and Retention of School-Based AFNR Educators
Investigator:	Amy Smith
IRB ID:	STUDY00012162
Sponsored Funding:	None
Grant ID/Con Number:	None
Internal UMN Funding:	None
Fund Management Outside University:	None
IND, IDE, or HDE:	None
Documents Reviewed with this Submission:	<ul style="list-style-type: none">• Social Protocol, Category: IRB Protocol;• Survey Instrument, Category: Other;• Pilot Study Teacher Recruitment Letter, Category: Recruitment Materials;• Social Behavioral Consent Form, Category: Consent Form;• Teacher Recruitment Letter, Category: Recruitment Materials;• Survey Instrument Permissions, Category: Other;• Pilot Study Social Behavioral Consent Form,

Driven to DiscoverSM

	Category: Consent Form;
--	-------------------------

The IRB determined that this study meets the criteria for exemption from IRB review. To arrive at this determination, the IRB used "WORKSHEET: Exemption (HRP-312)." If you have any questions about this determination, please review that Worksheet in the [HRPP Toolkit Library](#) and contact the IRB office if needed.

This study met the following category for exemption:

- (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) as the following criteria are met: (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation

Ongoing IRB review and approval for this study is not required; however, this determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a Modification to the IRB for a determination.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the [HRPP Toolkit Library](#) on the IRB website.

For grant certification purposes, you will need these dates and the Assurance of Compliance number which is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003).

Sincerely,

Jeffery Perkey, CIP, MLS
Senior IRB Analyst

IMPORTANT: All human research conducted at the University of Minnesota must adhere to the [IRB guidance and requirements](#), [Office of the Vice President for Research guidance](#), and the [Medical School/Office of Academic Clinical Affairs Sunrise Implementation Plan](#) in response to the COVID-19 pandemic. Non-medical school investigators should contact their Associate Dean for Research for information on the "sunrise" process.

Even with IRB approval, in-person research visits may not take place without documented approval by either the Medical School/OACA sunrise process or the Associate Dean for Research sunrise process. These reviews are intended to protect the health of all research participants and the broader University/Fairview communities during the COVID-19 pandemic. Researchers must inform the IRB of their approved sunrise plans. The IRB will document the approval status on ETHOS via a comment in the study history section. Please note that IRB approved COVID-19 related research is exempt from the sunrise requirements.

All researchers should review the guidance for the IRB, the medical school and their own departments as guidance is updated frequently.

Appendix D

Panel of Experts

Rebecca J. Collie, PhD

Scientia Associate Professor of Educational Psychology

Australian Research Council DECRA Fellow

Dennis Duchon, Ph.D.

Professor Emeritus

Department of Management

University of Nebraska

Mark Fichman

Emeritus Associate Professor of Business

Tepper School of Business

Carnegie Mellon University

Brad Greiman, Ph.D.

Professor Emeritus

Department of Agricultural Education, Communication, and Marketing

University of Minnesota

Becky Haddad, Ph.D.

Lecturer

Department of Agricultural Education, Communication, and Marketing
University of Minnesota

Laura Hasselquist, Ph.D.

Assistant Professor

Department of Teaching, Learning and Leadership

South Dakota State University

Tracy Kitchel, Ph.D.

Senior Associate Dean and Director of Faculty and Staff Affairs

College of Food, Agricultural, and Environmental Sciences

The Ohio State University

Aaron J. McKim

Assistant Professor of Community Sustainability

Department of Agriculture, Food, and Natural Resources Education

Michigan State University

Robert Torres

Professor

Department of Agricultural Education, Technology and Innovation

University of Arizona

Appendix E

Letter to Panel of Experts

Dear (Panel Member),

I am a doctoral student in Curriculum and Instruction in Agricultural Education at the University of Minnesota working on my dissertation about early-career School-Based Agricultural Education teacher retention.

You are being asked to participate in the expert panel review of our questionnaire because you are considered an expert in teacher retention having published research in our field.

As part of a study on the retention of School-Based Agricultural Education teachers, approved by the University of Minnesota, we are working to explore the relationship between psychological functioning, work-related perceptions, and teacher retention. The following objectives will be explored in this study:

1. Describe the retention rates of school-based agricultural education teachers that have taught for fewer than twenty years.
2. Examine the relationship between psychological functioning (e.g., autonomy, competence, and relatedness) and work-related perceptions of school-based agricultural education teachers who have taught for fewer than twenty years.
3. Examine the relationship between school-based agricultural education teachers' retention rate and psychological needs satisfaction.

The survey instrument is a 94-item questionnaire adapted to address the psychological functioning and work-related perceptions of SBAE teachers. The present study will examine SBAE teachers' psychological functions by measuring four overarching work-related perceptions with various relevant constructs: well-being, job satisfaction, motivation, and professional commitment. The study's questionnaire is a compilation of several instruments and questionnaires developed to measure constructs within psychological functioning and work-related perception factors. The compilation and additional research developed questions are being used to develop an instrument with four subscales (i.e., work-related well-being, job-related satisfaction, intrinsic motivation, and professional commitment) to measure the variable constructs.

We would like you to review the questionnaire for face and content validity. Attached to this email is a document with the questionnaire including notes about edits made to original items. We would appreciate your input on the directions, questions, and statements. You can make comments or changes directly within the document and email it back to Lavyne at rada@umn.edu by Wednesday, February 24. If you are unable to provide feedback, please let us know. Conceptual definitions are included for your reference. You may also be asked to participate in the second review of the instrument for construct validity.

In accordance with Institutional Review Board (IRB) requirements, you should know that your participation is strictly voluntary. Information you provide is not considered confidential. Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. Your decision on participation will not result in any loss of benefits to which you are otherwise entitled, nor will it impact your relationship with School-Based Agricultural Education, the National FFA Organization, or the University of Minnesota. This study does require participants to complete a consent form for agreement to participate. You may “opt-out” at any time without any negative ramifications.

If you have any questions about the research project or consent form, you may contact Ms. Lavyne Rada, Graduate student at 605/605-1861 or Dr. Amy Smith, Associate Professor at the University of Minnesota at 612/624-6590.

Thank you for your time and assistance in this study. We look forward to working with you.

Ms. Lavyne Rada
Graduate student
University of Minnesota
Co-Investigator
605/695-1861

Dr. Amy Smith
Associate Professor
University of Minnesota
Primary Investigator
612/624-6590

Appendix F

Invitation Letter for pilot study

{m://FirstName},

As part of the research study on the retention of School-Based Agricultural Education teachers, approved by the University of Minnesota, we are working to explore the relationship between intrinsic motivation factors and teacher retention. We are asking School-Based Agricultural Education teachers across the Midwest to help confirm the value of a new questionnaire focused on motivation, well-being, professional commitment, and job satisfaction. As a previous South Dakota agriculture teacher, I know that teacher retention is an important topic to address as programs continue to grow.

We would like you to complete a questionnaire that should take approximately 11-minutes to complete. We ask that you complete the questionnaire by Friday, May 14.

Follow this link to the Survey:

{l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:

{l://SurveyURL}

You will be asked for a unique participant code. Please enter the code found below when prompted in the questionnaire.

Participant code: {m://ExternalDataReference} (if your code is not appearing, please enter your initials)

In accordance with Institutional Review Board (IRB) requirements, you should know that your participation is strictly voluntary. Information you provide is not considered confidential. Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. Your decision on participation will not result in any loss of benefits to which you are otherwise entitled, nor will it impact your relationship with School-Based Agricultural Education, the National FFA Organization, or the University of Minnesota. This study does require participants to complete a consent form for agreement to participate. You may “opt out” at any time without any negative ramifications.

If you have any questions about the research project or consent form, you may contact Ms. Lavyne Rada, Graduate student at 605/605-1861 or Dr. Amy Smith, Associate Professor at the University of Minnesota at 612/624-6590.

Thank you for your time and assistance in this study. We look forward to working with you.

Ms. Lavyne Rada
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arsmith@umn.edu

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Appendix G

Online Questionnaire for Pilot Test

Background: Please share your career experiences in Agriculture, Food, and Natural Resources (AFNR) education.

1. Including the current school year, how many years have you taught Agriculture, Food, and Natural Resources (AFNR) education? (please use full years)
2. How many years have you taught AFNR education at your current school district including this year? (please use full years)
3. How many different school districts have you taught in as an AFNR teacher?
4. Was teaching your first career?
 - a. If no: What was your job title in your first career?
 - b. If no: How many years were you in a career other than teaching?
 - c. If yes: At any point in your career, have you left teaching AFNR?
 - d. If yes: Describe the circumstances around your departure and return to teaching AFNR.
5. Please select all experiences you have had to date (choose all that apply):
 - a. Undergraduate licensure program in Agricultural Education completed
 - i. List Undergraduate degree(s) earned
 - ii. Institution(s) attended for undergraduate degree
 - b. Graduate licensure program in Agricultural Education completed
 - i. List Graduate Degree(s) earned
 - ii. Institution(s) attended for graduate degree
 - c. Student teaching experience in your current school

- d. Student teaching experience in another school district
 - e. National Board for Professional Teaching Standards Certification
 - f. Induction/Mentoring program in your school district
 - g. Induction/Mentoring program in AFNR education (e.g. TIP)
 - h. Curriculum for Agricultural Science Education (CASE)
 - i. Resources for Professional Learning (RPL)
 - j. Future AgriScience Teacher (FAST) Symposium
 - k. None apply
 - l. Other (*please specify below*)
-

Section I: Well-being – Work -related Basic Need Satisfaction (W-BNS)

The following statements relate to your personal experiences **in your current school district**. Please indicate your level of agreement using the following scale: 1 (strongly disagree) and 5 (strongly agree).

Autonomy Satisfaction

- 1. I feel like I can be myself at my job.
- 2. I often feel like I have to follow other's directions at work.
- 3. If I could choose, I would do things at work differently. *
- 4. The tasks I have to do at work are in line with what I really want to do.
- 5. I feel free to do my job the way I think it could best be done.
- 6. In my job, I feel forced to do things I do not want to do. *

Competence Satisfaction

- 7. I don't feel competent in my job. *

8. I master my tasks at my job.
9. I feel competent at my job.
10. I doubt whether I am able to execute my job properly. *
11. I am good at the things I do in my job.
12. I can accomplish difficult tasks at work.

Relatedness Satisfaction

13. I don't feel connected with other people at my job. *
14. At work, I feel like I belong.
15. I don't connect with other colleagues at my job. *
16. At work, I can talk with colleagues about things that matter to me.
17. I often feel alone when I am with my colleagues. *
18. Some colleagues I work with are close friends of mine.

**Section II: Well-being – Work-related Basic Need Satisfaction (W-BNS) in
Agricultural Education**

The following statements related to your personal experiences **within the school-based agricultural education (SBAE) profession**. Please indicate your level of agreement using the following scale: 1 (strongly disagree) and 5 (strongly agree). SBAE teachers within their school, state, or nationally are considered the SBAE profession for this survey.

Relatedness Satisfaction in the SBAE profession

19. I don't feel connected with other people in the SBAE profession. *
20. I feel I am a part of the SBAE profession.
21. I don't connect with other people in the SBAE profession. *

22. I can talk with colleagues about things that matter to me in the SBAE profession.

23. I often feel excluded when I am with my SBAE colleagues. *

24. Some colleagues in the SBAE profession are close friends of mine.

Section III: Professional Commitment – Intention to Turnover (MOAQ-JSS)

Below are statements of how people feel about the job in which they work. Please select the appropriate response on a scale of 1 (strongly disagree) to 7 (strongly agree) which most closely matches how you feel about **your commitment**.

25. It is likely I will actively look for a new job in the next year.

26. I often think about quitting.

27. I will probably look for a new job in the next year.

Demographics - Complete the following demographic information.

1. What is your year of birth?

2. What is your ethnic background (choose all that apply)?

a. American Indian or Alaska Native

b. Asian

c. Black or African American

d. Hispanic or Latino

e. Native Hawaiian or Pacific Islander

f. White

g. Other (please specify)

h. Prefer not to say

3. How would you describe your gender?

a. Male

- b. Female
- c. Other (please specify)
- d. Prefer not to say

Appendix H

Cover Letter for study

{m://FirstName},

As part of my dissertation research on the retention of School-Based Agricultural Education (SBAE) teachers, approved by the University of Minnesota, we are working to explore the relationship between psychological needs satisfaction and professional commitment. We are asking Minnesota SBAE teachers to complete a questionnaire, which addresses the following questions:

- What is the relationship between need satisfaction of autonomy and SBAE teacher professional commitment?
- What is the relationship between need satisfaction of competence and SBAE teacher professional commitment?
- What is the relationship between need satisfaction of relatedness and SBAE teacher professional commitment?
- What is the relationship between psychological needs satisfaction of autonomy, competence, and relatedness and SBAE teacher professional commitment?
- What is the impact of years teaching SBAE on SBAE teacher professional commitment?
- What is the impact of years teaching SBAE on SBAE teacher psychological needs satisfaction?

Please complete the questionnaire (linked below) as soon as you are able. The questionnaire should take less than 10-minutes to complete. We intend to complete data collection by **Monday, June 15**; we'll be sending reminders as necessary to encourage completion.

Follow this link to the Survey:

{l://SurveyLink?d=Take%20the%20survey}

Participant Code: {m://ExternalDataReference}

Or copy and paste the URL below into your internet browser:

{l://SurveyURL}

In accordance with Institutional Review Board (IRB) requirements, you should know that your participation is strictly voluntary. Information you provide is not considered confidential. Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. Your decision on participation will not result in any loss of benefits to which you are otherwise entitled, nor will it impact your relationship with School-Based Agricultural Education, the National FFA Organization, or the University of Minnesota. This study does require participants to complete a consent form for

agreement to participate. You may “opt out” at any time without any negative ramifications.

If you have any questions about the research project or consent form, you may contact Ms. Lavyne Rada, Graduate student at 605/605-1861 or Dr. Amy Smith, Associate Professor at the University of Minnesota at 612/624-6590.

Thank you for your time and assistance in this study. We look forward to working with you.

Ms. Lavyne Rada
Graduate student
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Dr. Amy Smith
Associate Professor
University of Minnesota
Primary Investigator
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arsmith@umn.edu

Appendix I

Online Questionnaire for Study

Section I: Well-being – Work -related Basic Need Satisfaction (W-BNS)

The following statements relate to your personal experiences **in your current school district**. Please indicate your level of agreement using the following scale: 1 (strongly disagree) and 5 (strongly agree).

Autonomy Satisfaction

1. I feel like I can be myself at my job.
2. I often feel like I have to follow other's directions at work.
3. If I could choose, I would do things at work differently. *
4. The tasks I have to do at work are in line with what I really want to do.
5. I feel free to do my job the way I think it could best be done.
6. In my job, I feel forced to do things I do not want to do. *

Competence Satisfaction

7. I don't feel competent in my job. *
8. I master my tasks at my job.
9. I feel competent at my job.
10. I doubt whether I am able to execute my job properly. *
11. I am good at the things I do in my job.
12. I can accomplish difficult tasks at work.

Relatedness Satisfaction

13. I don't feel connected with other people at my job. *
14. At work, I feel like I belong.

15. I don't connect with other colleagues at my job. *
16. At work, I can talk with colleagues about things that matter to me.
17. I often feel alone when I am with my colleagues. *
18. Some colleagues I work with are close friends of mine.

Section II: Well-being – Work-related Basic Need Satisfaction (W-BNS) in

Agricultural Education

The following statements related to your personal experiences **within the school-based agricultural education (SBAE) profession**. Please indicate your level of agreement using the following scale: 1 (strongly disagree) and 5 (strongly agree). SBAE teachers within their school, state, or nationally are considered the SBAE profession for this survey.

Relatedness Satisfaction in the SBAE profession

19. I don't feel connected with other people in the SBAE profession. *
20. I feel I am a part of the SBAE profession.
21. I don't connect with other people in the SBAE profession. *
22. I can talk with colleagues about things that matter to me in the SBAE profession.
23. I often feel excluded when I am with my SBAE colleagues. *
24. Some colleagues in the SBAE profession are close friends of mine.

Section III: Professional Commitment – Intention to Turnover (MOAQ-JSS)

Below are statements of how people feel about the job in which they work. Please select the appropriate response on a scale of 1 (strongly disagree) to 7 (strongly agree) which most closely matches how you feel about **your commitment**.

25. It is likely I will actively look for a new job in the next year.

26. I often think about quitting.

27. I will probably look for a new job in the next year.

Background – Please share your career experiences in Agriculture, Food, and Natural Resources (AFNR) education.

1. Including the current school year, how many years have you taught Agriculture, Food, and Natural Resources (AFNR) education? (please use full years)
2. How many years have you taught AFNR education at your current school district including this year? (please use full years)
3. How many different school districts have you taught in as an AFNR teacher?
4. Was teaching your first career?
 - a. If no: What was your job title in your first career?
 - b. If no: How many years were you in a career other than teaching?
 - c. If yes: At any point in your career, have you left teaching AFNR?
 - d. If yes: Describe the circumstances around your departure and return to teaching AFNR.
5. Please select all experiences you have had to date (choose all that apply):
 - a. Undergraduate licensure program in Agricultural Education completed
 - i. List Undergraduate degree(s) earned
 - ii. Institution(s) attended for undergraduate degree
 - b. Graduate licensure program in Agricultural Education completed
 - i. List Graduate Degree(s) earned
 - ii. Institution(s) attended for graduate degree
 - c. Student teaching experience in your current school

- d. Student teaching experience in another school district
 - e. National Board for Professional Teaching Standards Certification
 - f. Induction/Mentoring program in your school district
 - g. Induction/Mentoring program in AFNR education (e.g. TIP)
 - h. Curriculum for Agricultural Science Education (CASE)
 - i. Resources for Professional Learning (RPL)
 - j. Future AgriScience Teacher (FAST) Symposium
 - k. None apply
 - l. Other (*please specify below*)
-

Demographics - Complete the following demographic information.

- 6. What is your year of birth?
- 7. What is your ethnic background (choose all that apply)?
 - a. American Indian or Alaska Native
 - b. Asian
 - c. Black or African American
 - d. Hispanic or Latino
 - e. Native Hawaiian or Pacific Islander
 - f. White
 - g. Other (please specify)
 - h. Prefer not to say
- 8. How would you describe your gender?
 - a. Male

- b. Female
- c. Other (please specify)
- d. Prefer not to say

Appendix J

First Reminder

#{m://FirstName},

As part of my dissertation research on the retention of School-Based Agricultural Education (SBAE) teachers, approved by the University of Minnesota, we are working to explore the relationship between psychological needs satisfaction and professional commitment. Last week, I invited you to participate in this research.

Please complete the questionnaire (linked below) as soon as you are able. The questionnaire should take less than 10-minutes to complete. We intend to complete data collection by **Wednesday, June 15**.

Follow this link to the Survey:

#{l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:

#{l://SurveyURL}

You will be asked for a unique participant code. Please enter the code below.

Participant code: #{m://ExternalDataReference}

In accordance with Institutional Review Board (IRB) requirements, you should know that your participation is strictly voluntary. Information you provide is not considered confidential. Efforts will be made to limit the use and disclosure of your personal information, including research study and other records, to people who have a need to review this information. Your decision on participation will not result in any loss of benefits to which you are otherwise entitled, nor will it impact your relationship with School-Based Agricultural Education, the National FFA Organization, or the University of Minnesota. This study does require participants to complete a consent form for agreement to participate. You may “opt out” at any time without any negative ramifications.

If you have any questions about the research project or consent form, you may contact Ms. Lavyne Rada, Graduate student at 605/605-1861 or Dr. Amy Smith, Associate Professor at the University of Minnesota at 612/624-6590.

Thank you for your time and assistance in this study. We look forward to working with you.

Ms. Lavyne Rada
Graduate student
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Appendix K

Second Reminder

#{m://FirstName},

As part of my dissertation research on the retention of School-Based Agricultural Education (SBAE) teachers, approved by the University of Minnesota, we are working to explore the relationship between psychological needs satisfaction and professional commitment. A few weeks ago, I invited you to participate in this research.

Please complete the questionnaire (linked below) as soon as you are able. The questionnaire should take less than 10-minutes to complete. We intend to complete data collection by **Wednesday, June 15**.

Follow this link to the Survey:

#{l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:

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You will be asked for a unique participant code. Please enter the code below.

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Appendix L

Final Reminder

#{m://FirstName},

As part of my dissertation research on the retention of School-Based Agricultural Education (SBAE) teachers, approved by the University of Minnesota, we are working to explore the relationship between psychological needs satisfaction and professional commitment. A few weeks ago, I invited you to participate in this research.

Please complete the questionnaire (linked below) as soon as you are able. The questionnaire should take less than 10-minutes to complete. We intend to complete data collection by **Wednesday, June 15**. This will be your final reminder.

Follow this link to the Survey:

#{l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser:

#{l://SurveyURL}

You will be asked for a unique participant code. Please enter the code below.

Participant code: #{m://ExternalDataReference}

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Appendix M

Checks for Violation of Assumptions

Figure M1

Scatterplot for Correlation Analysis of Autonomy and Turnover Intention

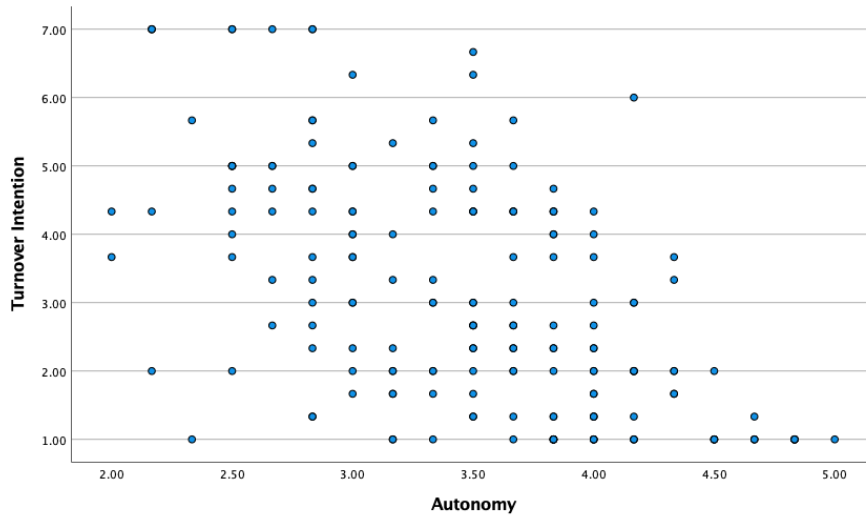


Figure M2

Scatterplot for Correlation Analysis of Competence and Turnover Intention

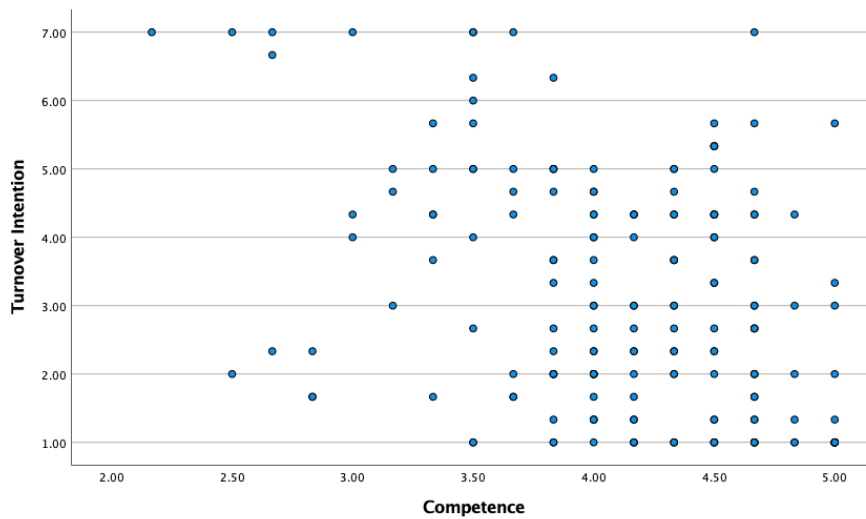


Figure M3

Scatterplot for Correlation Analysis of Relatedness in the School District and Turnover Intention

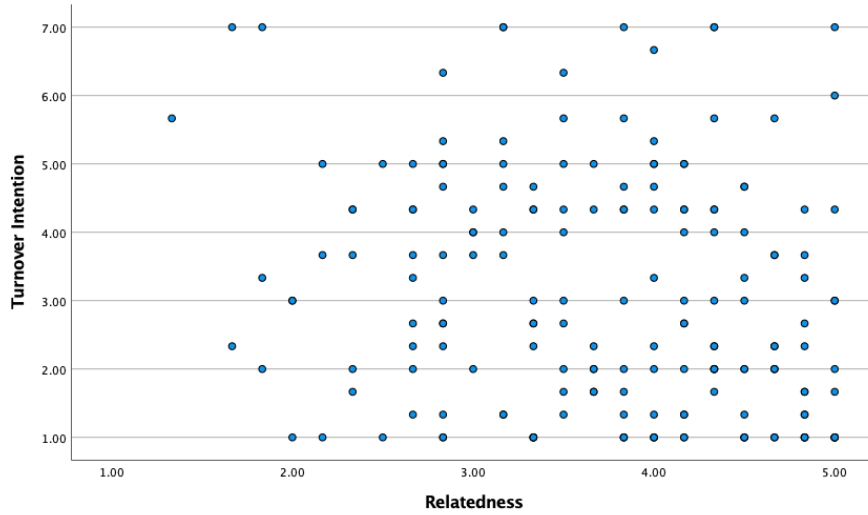


Figure M4

Scatterplot for Correlation Analysis of Relatedness in the SBAE Profession and Turnover Intention

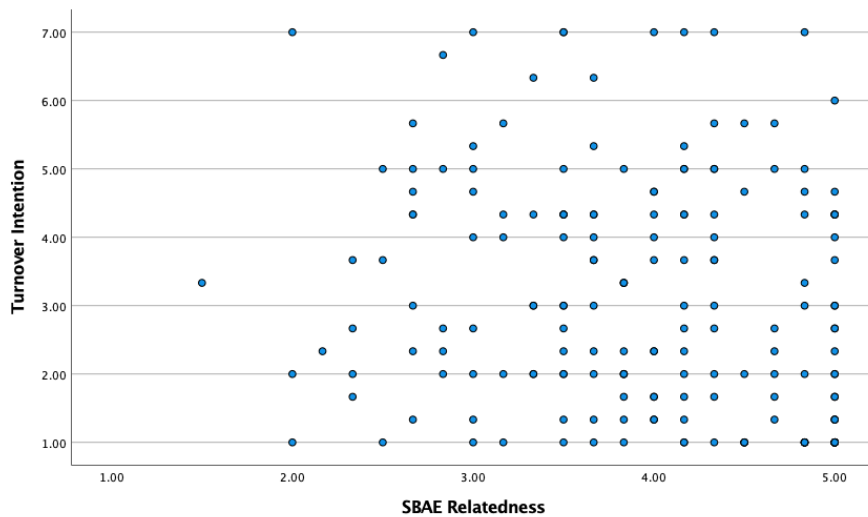


Figure M5

Scatterplot for Correlation Analysis of Psychological Needs Satisfaction and Turnover Intention

Intention

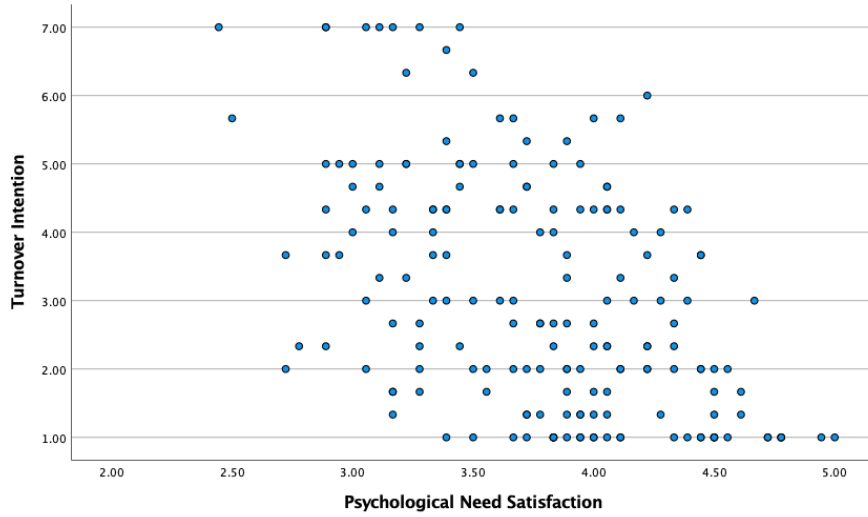


Figure M6

Scatterplot for Correlation Analysis of Years Teaching SBAE and Turnover Intention

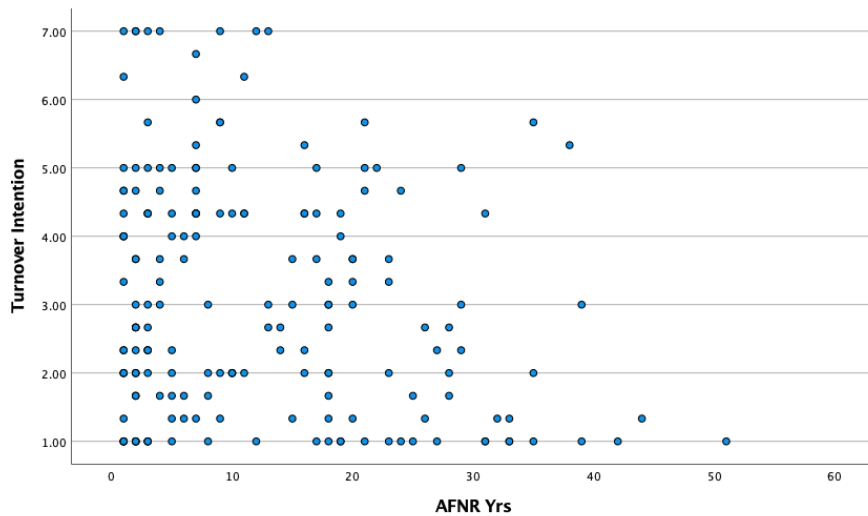


Table M1

Levene Test for Equality of Variances Comparing SBAE Teachers with Five or Fewer Years Teaching to Teachers with More than Five Years Teaching

Variable	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	<i>p</i>	<i>t</i>	df	Sig. (2-tailed)
Autonomy	.07	.79	-1.70	179	.09
			-1.71	149.38	.09
Competence	.24	.62	-3.95	179	.00
			-3.88	138.28	.00
Relatedness	1.53	.22	-.18	179	.86
			-.18	158.87	.85
SBAE Relatedness	.14	.70	-1.95	179	.05
			-1.94	144.23	.05
Psychological Need Satisfaction	.04	.84	-2.24	179	.03
			-2.29	156.41	.02
Turnover Intention	.03	.87	.29	179	.77
			.29	142.85	.77

Figure M7

Histogram of Psychological Needs Satisfaction Mean Score Distribution

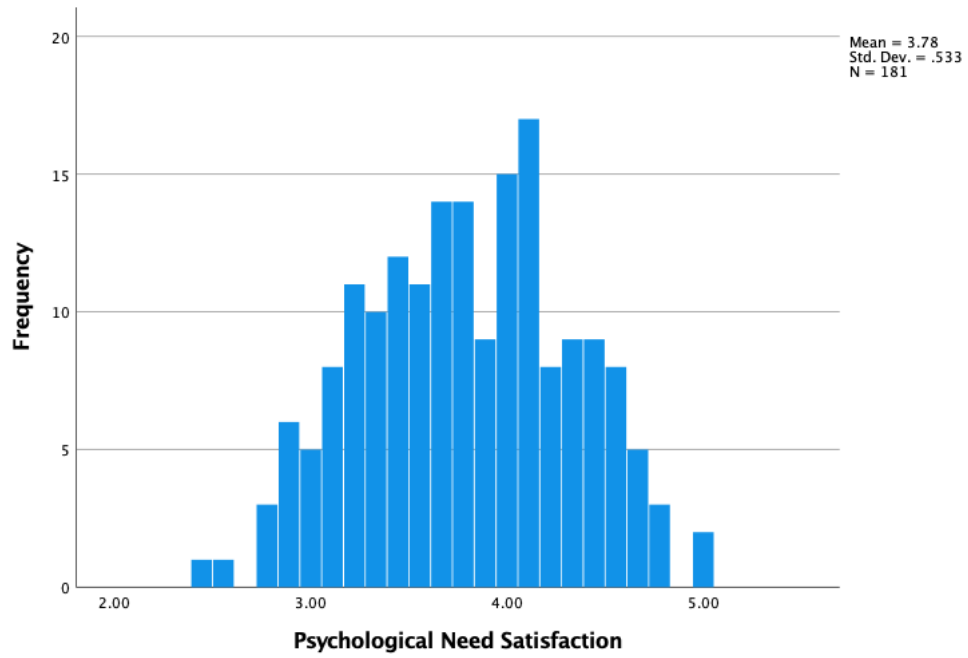


Figure M8

Histogram of Psychological Needs Satisfaction of Autonomy Mean Score Distribution

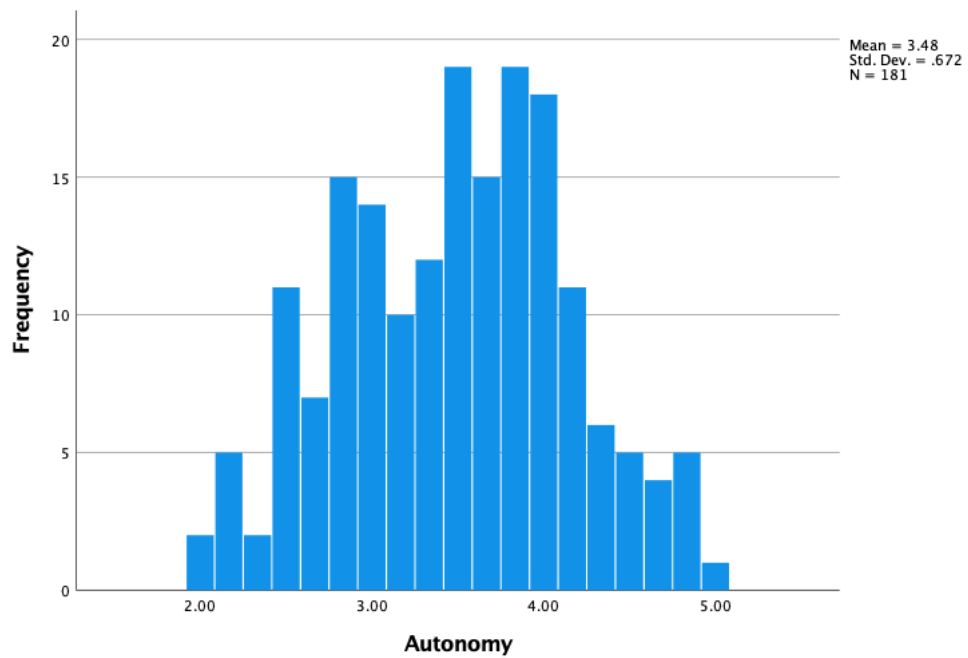


Figure M9

Histogram of Psychological Needs Satisfaction of Competence Mean Score Distribution

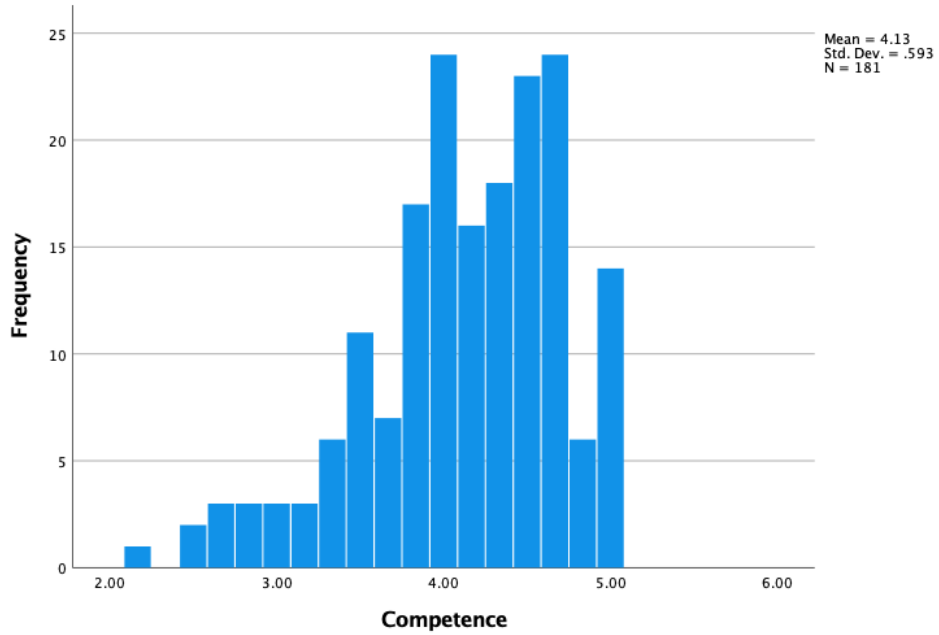


Figure M10

Histogram of Psychological Needs Satisfaction of Relatedness in the School District

Mean Score Distribution

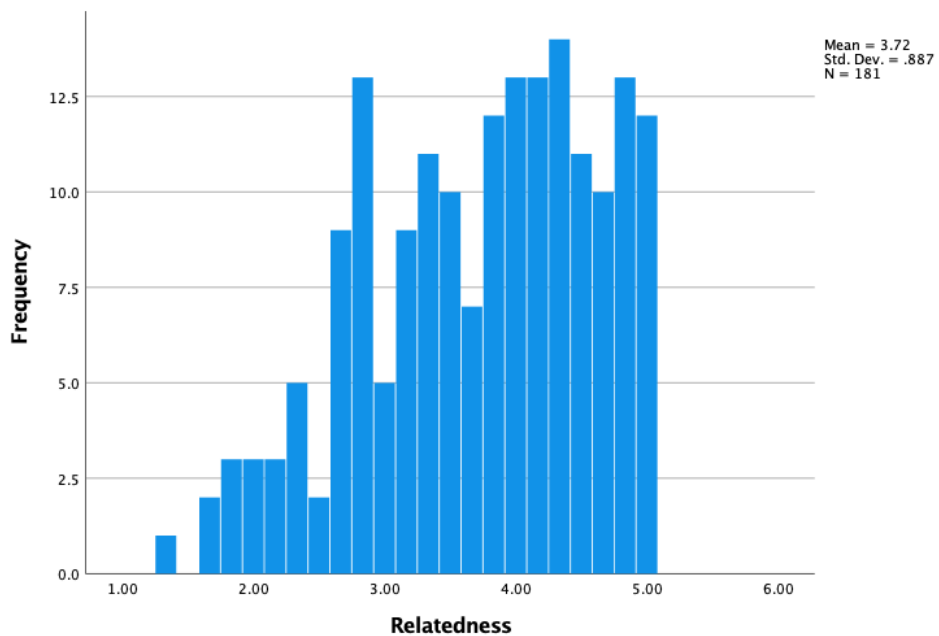


Figure M11

Histogram of Psychological Needs Satisfaction of Relatedness in the SBAE Profession

Mean Score Distribution

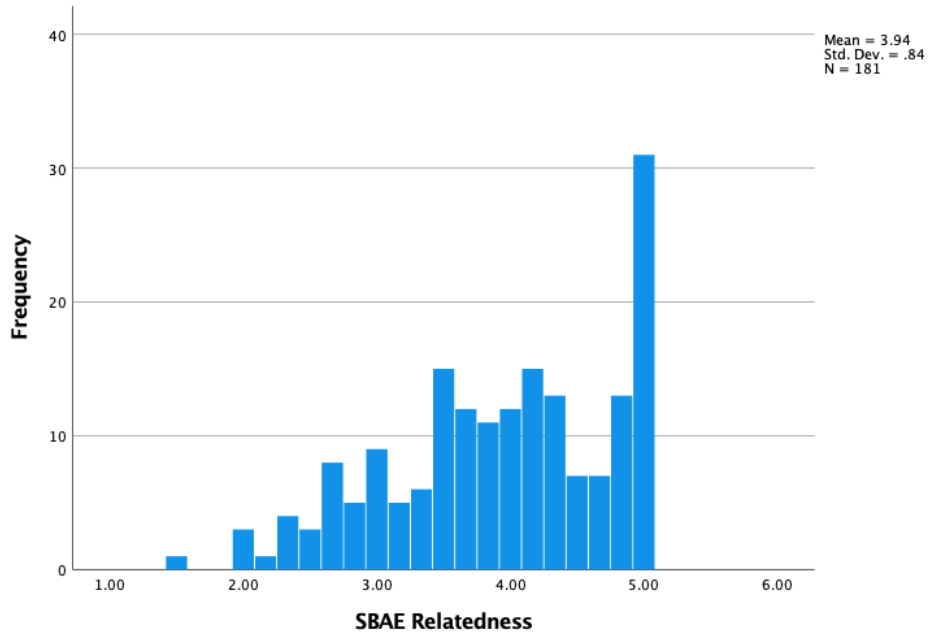


Figure M12

Histogram of Turnover Intention Mean Score Distribution

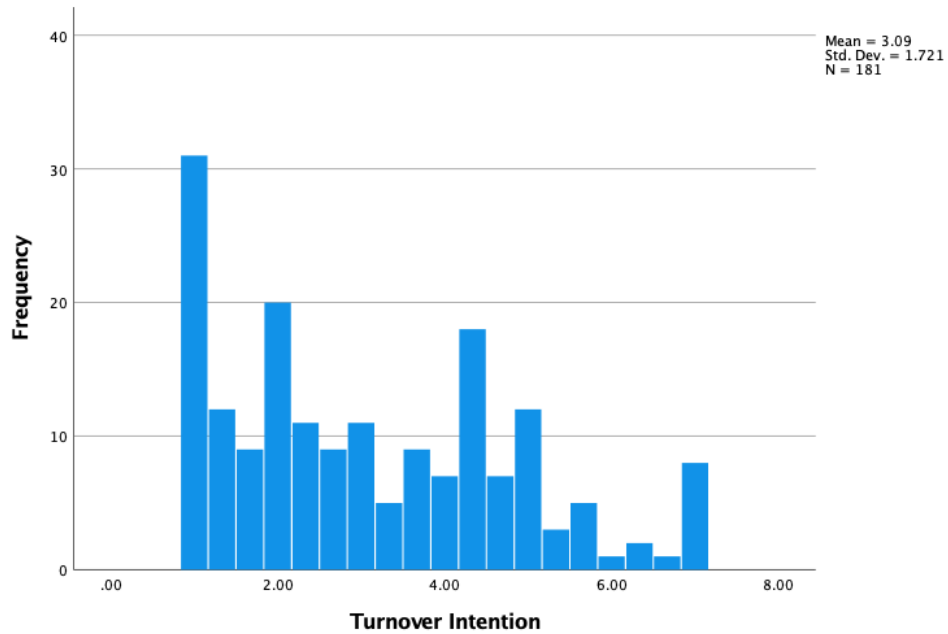


Figure M13

Histogram of Years Teaching SBAE Mean Score Distribution

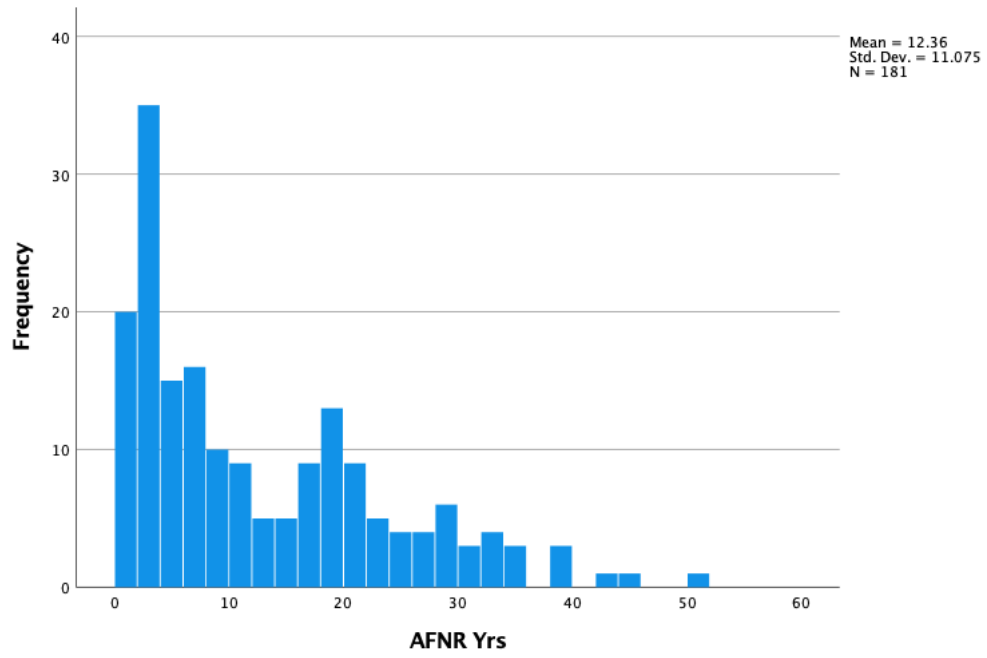


Table M2*Tests of Normality*

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	<i>df</i>	<i>p</i>	Statistic	<i>df</i>	<i>p</i>
Autonomy Satisfaction	.08	181	.01	.98	181	.03
Competence Satisfaction	.11	181	<.01	.94	181	<.01
Relatedness Satisfaction	.10	181	<.01	.96	181	<.01
Relatedness Satisfaction in SBAE Profession	.11	181	<.01	.94	181	<.01
Psychological Needs Satisfaction	.62	181	.09	.99	181	.17
Turnover Intention	.13	181	<.01	.92	181	<.01

Figure M14

Test of Homoscedasticity of Psychological Needs Satisfaction and Turnover Intention

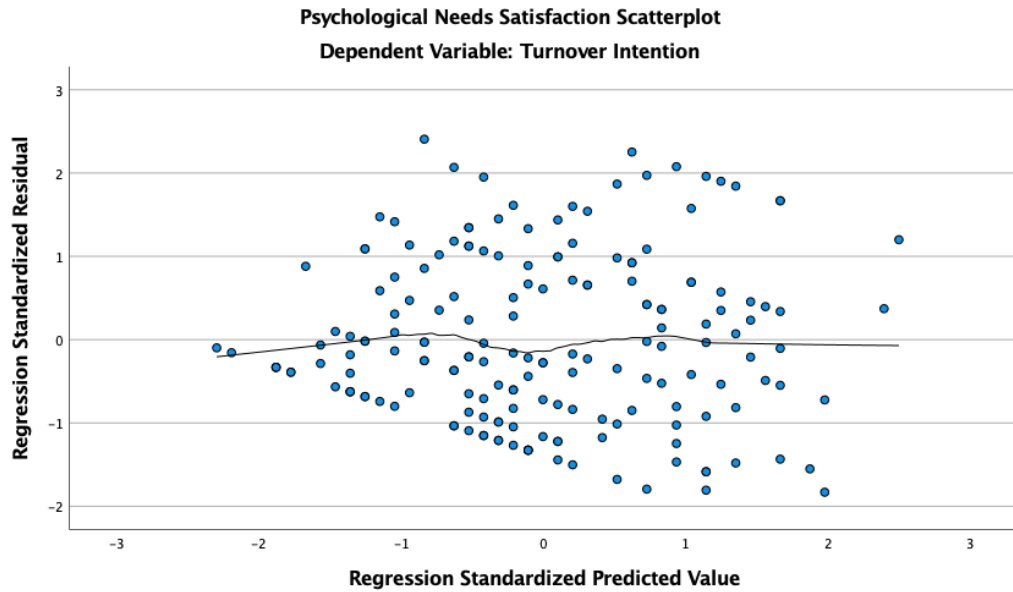


Figure M15

Test of Homoscedasticity of Psychological Needs Satisfaction of Autonomy and Turnover Intention

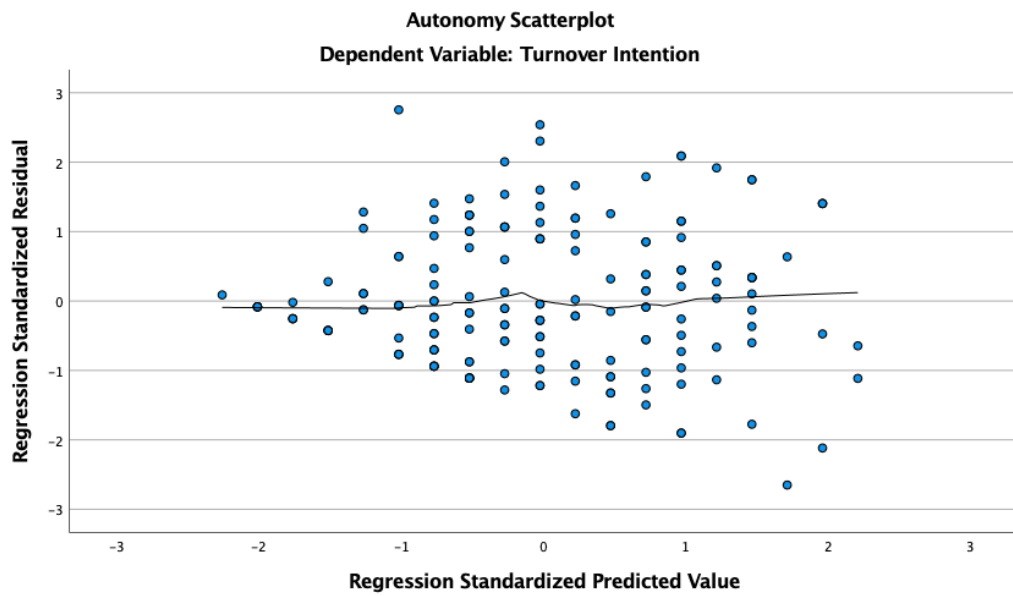


Figure M16

Test of Homoscedasticity of Psychological Needs Satisfaction of Competence and Turnover Intention

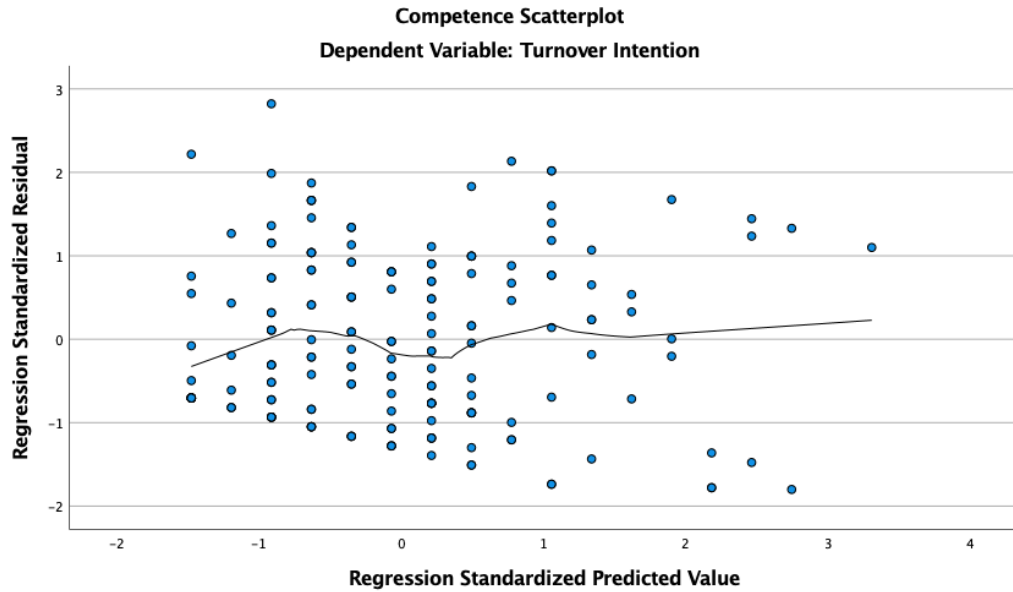


Figure M17

Test of Homoscedasticity of Psychological Needs Satisfaction of Relatedness in the School District and Turnover Intention

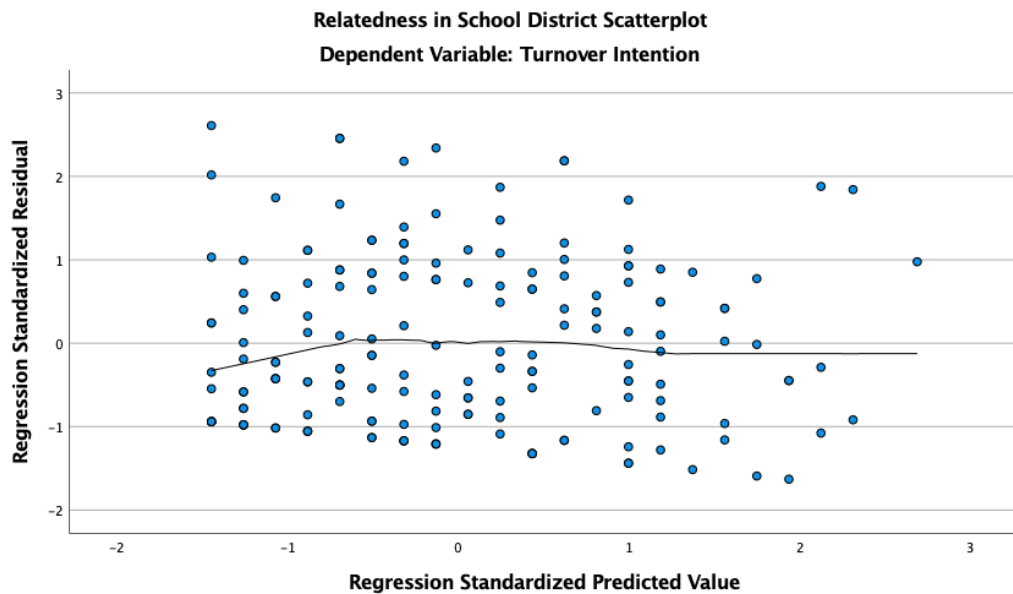


Figure M18

Test of Homoscedasticity of Psychological Needs Satisfaction of Relatedness in the SBAE Profession and Turnover Intention

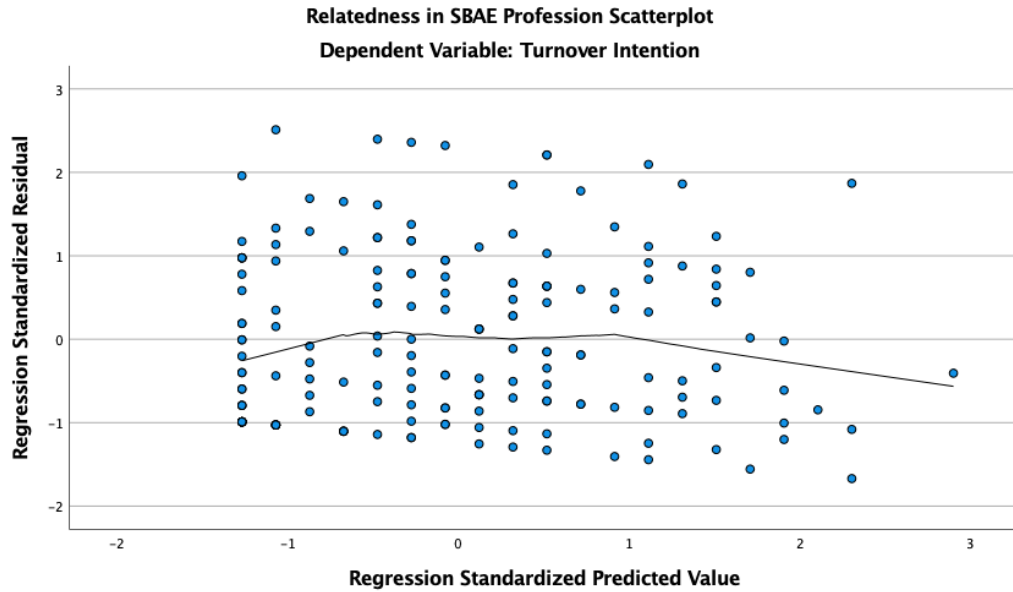
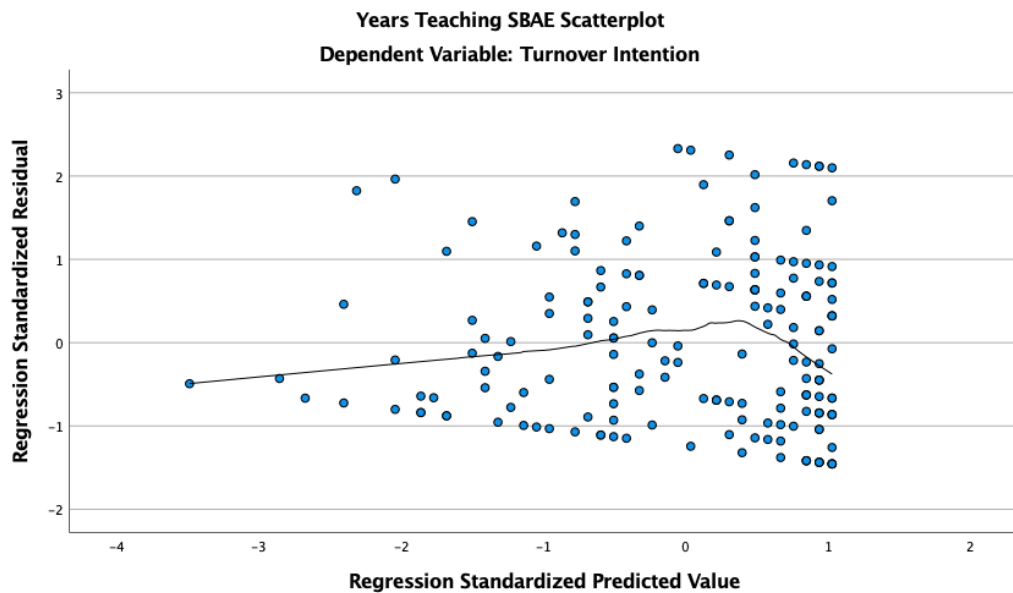


Figure M19

Test of Homoscedasticity of Years Teaching SBAE and Turnover Intention



Appendix N

Regression Analysis of Psychological Need Satisfaction of Autonomy and SBAE Teacher Professional Commitment

Table N1

Regression Analysis of Need Satisfaction of Autonomy and SBAE Teacher Professional Commitment Model Summary^b

	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	<i>p</i>	Durbin-Watson
Autonomy	.57 ^a	.32	.32	1.42	<.01	2.13

a. Predictors: (Constant), Autonomy

b. Dependent Variable: Turnover Intention

Table N2

Regression Analysis of Need Satisfaction of Autonomy and SBAE Teacher Professional Commitment ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172.63	1	172.63	85.65	.000 ^b
	Residual	360.79	179	2.02		
	Total	533.42	180			

a. Dependent Variable: Turnover Intention

b. Predictors: (Constant), Autonomy

Appendix O

Regression Analysis of Need Satisfaction of Competence and SBAE Teacher Professional Commitment

Table O1

Regression Analysis of Need Satisfaction of Competence and SBAE Teacher Professional Commitment Model Summary^b

	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	<i>p</i>	Durbin-Watson
Competence	.38 ^a	.14	.14	1.60	<.01	2.20

a. Predictors: (Constant), Competence

b. Dependent Variable: Turnover Intention

Table O 2

Regression Analysis of Need Satisfaction of Competence and SBAE Teacher Professional Commitment ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.57	1	76.57	30.00	.000 ^b
	Residual	456.85	179	2.55		
	Total	533.42	180			

a. Dependent Variable: Turnover Intention

b. Predictors: (Constant), Competence

Appendix P

Regression Analysis of Need Satisfaction of Relatedness in the School District and in the SBAE Profession and SBAE Teacher
Professional Commitment

Table P1

Regression Analysis of Need Satisfaction of Relatedness in the School District and SBAE Teacher Professional Commitment

Model Summary^b

	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	<i>p</i>	Durbin-Watson
Relatedness	.20 ^a	.04	.04	1.69	.01	2.09

a. Predictors: (Constant), Relatedness

b. Dependent Variable: Turnover Intention

Table P 2*Regression Analysis of Need Satisfaction of Relatedness in the School District and SBAE Teacher Professional Commitment**ANOVA^a*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.45	1	21.45	7.50	.01 ^b
	Residual	511.97	179	2.86		
	Total	533.42	180			

a. Dependent Variable: Turnover Intention

b. Predictors: (Constant), Relatedness

Table P3*Regression Analysis of Need Satisfaction of Relatedness in the SBAE Profession and SBAE Teacher Professional Commitment**Model Summary^b*

	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	<i>p</i>	Durbin-Watson
Relatedness	.19 ^a	.04	.03	1.69	.01	2.12

a. Predictors: (Constant), SBAE Relatedness

b. Dependent Variable: Turnover Intention

Table P4

Regression Analysis of Need Satisfaction of Relatedness in the SBAE Profession and SBAE Teacher Professional Commitment

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.77	1	18.77	6.52	.01 ^b
	Residual	514.656	179	2.88		
	Total	533.42	180			

a. Dependent Variable: Turnover Intention

b. Predictors: (Constant), SBAE Relatedness

Appendix Q

Table Q1

Teachers with an Agricultural Education Degree: Means, Standard Deviations, and Correlations among Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
Autonomy Satisfaction	3.48	.67	-					
Competence Satisfaction	4.14	.59	.41**	-				
Relatedness Satisfaction	3.69	.89	.39**	.18*	-			
Relatedness Satisfaction in SBAE Profession	3.99	.82	.24**	.22**	.39**	-		
Psychological Needs Satisfaction	3.77	.54	.79**	.64**	.79**	.40**	-	
Years of Experience	13.34	11.26	.27**	.45**	.04	.07	.30**	-
Turnover Intention	3.04	1.71	-.59**	-.37**	-.20*	-.15	-.49**	-.22**

*p < .05. **p < .01

Table Q2

Teachers Without an Agricultural Education Degree: Means, Standard Deviations, and Correlations among Variables

Variable	M	SD	1	2	3	4	5	6
Autonomy Satisfaction	3.51	.64	-					
Competence Satisfaction	3.90	.62	.64**	-				
Relatedness Satisfaction	3.98	.80	.32	.12	-			
Relatedness Satisfaction in SBAE Profession	3.53	.89	.20	.38	.37	-		
Psychological Needs Satisfaction	3.80	.51	.84**	.73**	.70**	.43	-	
Years of Experience	3.90	3.63	.42	.28	.16	.05	.37	-
Turnover Intention	3.53	1.92	-.62**	-.57**	-.22	-.31	-.60**	-.01

*p < .05. **p < .01